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A

CYCLOPÆDIA

OF

PRACTICAL RECEIPTS

AND

COLLATERAL INFORMATION.

Chem. Lab.

9482

COOLEY'S CYCLOPÆDIA

OF

PRACTICAL RECEIPTS

AND

COLLATERAL INFORMATION

IN THE

ARTS, MANUFACTURES, PROFESSIONS, AND TRADES;

INCLUDING

Medicine, Pharmacy, and Domestic Economy:

DESIGNED AS A COMPREHENSIVE

SUPPLEMENT TO THE PHARMACOPŒIA

AND

GENERAL BOOK OF REFERENCE

FOR THE MANUFACTURER, TRADESMAN, AMATEUR, AND
HEADS OF FAMILIES.

FIFTH EDITION

REVISED AND PARTLY REWRITTEN BY

RICHARD V. TUSON, F.C.S.,

PROFESSOR OF CHEMISTRY IN THE ROYAL VETERINARY COLLEGE; FORMERLY LECTURER
ON CHEMISTRY AT THE CHARING CROSS HOSPITAL.

LONDON:
J. & A. CHURCHILL, NEW BURLINGTON STREET.
1872.

TO

THE RIGHT HONORABLE

THE EARL OF DUNDONALD,

ADMIRAL OF THE WHITE,
REAR ADMIRAL OF THE UNITED KINGDOM,
G.C.B., F.R.S., ETC., ETC.,

AS

AN HUMBLE TRIBUTE OF ADMIRATION AND RESPECT
FOR
HIS PUBLIC CHARACTER,
HIS HIGH INTELLECTUAL ENDOWMENTS,
AND
HIS ARDUOUS, DISINTERESTED, AND WELL-DIRECTED EFFORTS
THROUGH A LONG LIFE
TO PROMOTE THE PROGRESS OF ART AND SCIENCE IN GREAT BRITAIN
AND ITS COLONIES,

This Work,

BY HIS KIND PERMISSION,

IS RESPECTFULLY DEDICATED

BY HIS LORDSHIP'S

MOST OBEDIENT AND HUMBLE SERVANT,

THE AUTHOR.

PREFACE.

THE design of the present work is briefly, but not completely expressed in its title-page. Independently of a reliable and comprehensive collection of formulæ and processes in nearly all the industrial and useful arts, it contains a description of the leading properties and applications of the substances referred to, together with ample directions, hints, data, and allied information, calculated to facilitate the development of the practical value of the book in the shop, the laboratory, the factory, and the household. Notices of the substances embraced in the Materia Medica of our national pharmacopœias, in addition to the whole of their preparations, and numerous other animal and vegetable substances employed in medicine, as well as most of those used for food, clothing, and fuel, with their economic applications, have been included in the work. The synonymes and references are other additions which will prove invaluable to the reader. Lastly, there have been appended to all the principal articles referred to, brief, but clear directions for determining their purity and commercial value, and for detecting their presence and proportions in compounds.

The sources from which I have derived the vast mass of materials forming this volume, are such as to render it deserving the utmost confidence. I have invariably resorted to the best and latest authorities, and have consulted almost innumerable volumes, both British and foreign, during its compilation. Secondary channels of information have been scarcely ever relied on, when original authorities were within my reach. A large portion of the work has been derived from my personal experience and observations in the departments of applied chymistry and hygiène, and from the processes of various laboratories and manufactories, many of which I can the more confidently recommend, from having either inspected or witnessed their employment on an extensive scale. The indiscriminate adoption of matter, without examination, has been uniformly avoided, and in no instance has any formula or process been admitted into this work, unless it rested on some well-known fact of science, had been sanctioned by usage, or come recommended by some respectable authority. The settlement of doubtful or disputed points has often occupied me a greater number of hours, and not unfrequently, a greater number of days, than that of the lines of letter-press which convey the results to the public. In all cases precedence has been given to the standard formulæ of our national pharmacopœias, and to those processes which long experience, or well-conducted experiments, have shown to be the most successful, profitable, and trustworthy. In general, the sources of information have been indicated, for the purpose of enabling the reader to form a better estimation of their value. Whenever this is not the case, in reference to borrowed formulæ and data, the omission has arisen from the impossibility of determining to whom the merit is justly due.

I have endeavoured, as much as possible, in the present work, to avoid confusion of the medical weights with those commonly used in trade and commerce; an attempt which, so far as I am aware, has not been successfully carried out in any other quarter. For this purpose I determined to entirely abandon the usual arbitrary signs or characters employed to represent the divisions of the apothecaries' pound, and to distinguish the two weights from each other, by simply printing, in different type, the plain English names and abbreviations representing their several denominations. The medical signs for the imperial gallon and its sub-divisions, have also been abandoned for their common English names. It would have afforded me pleasure to have reduced all the quantities to one uniform standard, had it been practicable, or, in all cases, advisable.

Under the names of most of the leading diseases that could be profitably noticed in the present work, such explanations and directions have been given as accord with the prevailing opinions and practice of the faculty at the present day. These, when judiciously applied, will prove invaluable to emigrants, travellers, voyagers, and other parties beyond the reach of legitimate medical assistance; and, under opposite circumstances, will, in general, enable those who have the care of the sick, the better to second and carry out the instructions and efforts of the physician for the benefit of their charge. Here, however, it may be useful to repeat the cautions given in other parts of this volume, as to the impropriety of unnecessarily meddling with the healing art, or neglecting a prompt application to a duly qualified practitioner, in all cases demanding either medical or surgical aid. It is an indubitable fact, that the best efforts of the inexperienced and uninitiated in the mysteries of medical science, must be always enormously behind those of parties whose whole lives and study have been devoted to the subject.

The nature of a condensed alphabetical arrangement not permitting numerous articles to come under distinct heads, or to be referred to under all their synonymes, the casual reader may often be led to suppose that this book is most deficient where in reality it is the most copious. In general, I have attempted, as much as possible, to bring together subjects of a closely allied character, and compounds which are analogous to each other, either in constitution, or the mode of their preparation. Thus, most of the formulæ for Mixtures, Ointments, Pills, &c., follow, in alphabetical order, the general articles under these heads; whilst those for the Oxides, Salts, &c., follow the names of their respective bases. In like manner, a notice of a number of preparations will be found included in that of their principal ingredients. The names under which the leading substances appear, are generally those which are most familiar to well-informed practical men, and which have commonly reference to either their acknowledged chemical constitution, or to some long-known and easily recognised quality. The following extract conveys an important lesson on this subject, with which I perfectly agree:—"We have been unwilling to make any unnecessary changes in the nomenclature of substances whose names are sanctioned by the usage of the present day; for these names have been, for the most part, rightly assigned by our predecessors, or confirmed by lapse of time. We are indeed aware, that every improvement in the knowledge of things ought to be embodied in their names; but we must be careful, in selecting or forming these names, not to make those points appear certain and established which are as yet doubtful, for it is safer to be in the rear than in advance of natural history."*

I have exerted myself to the utmost to ensure the accuracy and completeness of this volume, but I feel conscious that after all my efforts for this purpose, some errors have crept into it, that many subjects which deserve insertion in it have been omitted, and that many others have been either imperfectly or too briefly noticed. "Yet these failures, however frequent, may," I trust, "admit of extenuation and apology. To have attempted much is always laudable, even where the enterprise is above the strength that undertakes it. To rest below his aim is incident to every one whose fancy is active, and whose views are comprehensive; nor is any man satisfied with himself because he has done much, but because he conceives little." When I commenced this work, I resolved to leave nothing within its legitimate limits unexamined or unelucidated; and I flattered myself with a prospect of the hours which I should thus "revel away" in a pursuit so congenial to my desires—"the treasures with which I expected every search into those neglected mines to reward my labour—and the triumph with which I should display my acquisitions to mankind. But these were the dreams of a poet, doomed at last to wake a" Cyclopædist. The long task which I had undertaken soon exhibited its truly onerous character, and daily grew in urgency, until that which promised to be a pleasure, had been transformed into an exhausting and continuous labour. At first, a sacrifice of the hours of leisure only, seemed necessary to the undertaking,—next, those assigned to professional and business avocations were demanded, and absorbed,—but, ere long, one by one, the hours usually devoted to repose were sucked into the insatiable vortex, until the bright beams of the rising sun not unfrequently illumined the lamp-lit study or the gloomy laboratory, and surprised the author, no longer an enthusiast, at his still-enduring task. But long ere this I had learned, that to carry out my original resolutions in all their completeness and entirety was impossible, and "that to pursue perfection was, like the first inhabitants of Arcadia, to chase the sun, which, when they had reached the hill where he had seemed to rest, was still at the same distance from them."* All I can further say in reference to this point, is simply to assure the reader, that three of the elements usually deemed essential to give value to a technological work,—viz., zeal, industry, and capital, have not been wanting in the production of the present one;—the first two depending on the author, and the other chiefly on the liberality and enterprise of the publisher.

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* Preface to the Ph. L. 1851.

As heretofore, I beg to solicit my readers to apprise me of any inaccuracies or omissions in this volume which may come beneath their notice. I shall also thankfully receive any hints or suggestions tending to the improvement of future editions of this work. Such communications, to be useful, must, however, be written on only one side of the paper. Parties who may thus kindly afford me assistance, will, in due course, have their services publicly acknowledged; and their names and addresses, unless when otherwise requested, will be published in full.

I have endeavoured to render the present volume as self-explanatory as possible, and, in general, have appended ample directions to the several formulæ and processes that seemed to me likely to cause embarrassment to those inexpert in chemical manipulation; but should any party find it otherwise, I shall be happy to reply, gratuitously, to any reasonable questions tending to elucidate the difficulty.

In conclusion, I may add that, having now for nearly a quarter of a century devoted my attention to the applications of chymistry in most of the useful arts and manufactures, both British and foreign, and in sanitation, I am in possession of many valuable processes and formulæ, hitherto wholly unknown, or but partially developed, with various improved plans of factories, laboratories, ventilation, &c., which the limits of this work will not permit me to describe in its pages, but on which I should be happy to communicate with parties interested in the same. Persons desirous of establishing any new branch of manufacture, or of improving an existing one, or of determining the purity or value of articles of food, wines, liqueurs, medicines, &c., or of obtaining formulæ or processes which are not contained in this work, may, in like manner, have their wishes complied with, by inclosing to me samples, or the requisite information.

ARNOLD J. COOLEY.

LONDON, *February* 1, 1856.

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* Dr. Samuel Johnson's Preface to his English Dictionary

PREFACE TO THE FIFTH EDITION.

Although, in preparing a fifth edition of this work, it has been subjected to a thorough and complete revision, every endeavour has been made to carry out the original intentions of the author. The arts and sciences are, however, so continuously undergoing change that, in order to bring the information given up to the level of the knowledge of the present day, very many excisions, alterations, and additions have been rendered necessary. Thus, in the chemical portions of the work all subjects of practical importance have been retained, corrected, and added to, while those which possess only a purely scientific interest have, for the most part, been expunged; to the name of every substance of established composition a formula has been attached, and the articles on chemical doctrine have been re-written. In carrying out this part of my duty I have been most efficiently aided by my talented assistant, Mr. Edmund Neison.

The value of this Cyclopædia to the pharmaceutist will, it is hoped, be increased by the additions which have been made from the British, Indian, and United States Pharmacopœias.

The length and number of the articles on the recognition and treatment of disease have been reduced, as it was thought that those of previous editions might, in many instances, be productive of more harm than benefit to those for whom such information was compiled, namely, emigrants and others not within the reach of the surgeon or physician.

Every article on excisable or duty-bearing commodities has been carefully revised or re-written by my able and experienced friend, Mr. William Harkness, of the Inland Revenue Department.

In the previous editions the use of different types was not only extensively, but apparently, indiscriminately indulged in, consequently the advantage to be derived from their legitimate employment was considerably diminished, and the mental and mechanical processes involved in the reading of such pages were rendered uselessly irksome. In the present edition this objectionable practice has been discontinued, Roman type only being adopted, except in special cases warranting a departure from this rule.

In conclusion, I have to express my obligations to the gentlemen whose names appear on the next page, for the very valuable assistance they have cheerfully afforded me in performing the task of preparing the following sheets for publication.

RICHARD V. TUSON.

ROYAL VETERINARY COLLEGE,
CAMDEN TOWN;
June, 1872.

ABBREVIATIONS, ETC., USED IN THIS WORK.

THESE, for the most part, consist of the first syllable, or the initial letter or letters of the words they stand for. As *Prep.*, preparation; *Pur.*, purity; *Purif.*, purification; *Obs.*, observations; *Var.*, varieties, &c.—Ph., stands for *pharmacopœia;* B. P., for *British Pharmacopœia*, Ind. Ph., for *Indian Pharmacopœia*, Cod. for *codex.*—L., E., D., P., U. S., &c., associated with the last two abbreviations, are the initial letters of the cities and countries which produced the respective works; as, London, Edinburgh, Dublin, Paris, United States, &c. When no dates are given, the last editions of the pharmacopœias are referred to.

lb., *oz.*, *dr.*, respectively represent the *pound, ounce*, and *drachm* (⅛ *oz.*), AVOIRDUPOIS WEIGHT. This is the only weight employed in the British and last Dublin Pharmacopœias.

lb., oz., dr., and gr., refer to the *pound, ounce, drachm*, and *grain*, APOTHECARIES' or TROY WEIGHT.

The word '*drop*' in all cases indicates a measured drop or minim.

The *names of individuals* which appear in this work are those to whom the immediately attached information or formula is usually attributed, or on whose recommendation or authority it has been selected.

′ denotes the *accented vowel* or *syllable*.

″ „ that the following consonant coalesces with the preceding letter in utterance.

† „ that the name or the definition to which it is attached is '*obsolete*.'

* „ „ „ „ „ '*obsolescent*,' little used, or objectionable.

‡ „ that the name or the definition to which it is attached is '*colloquial*,' or popular, or used only in trade.

§ „ that the name or the definition to which it is attached is '*vulgar*.'

Abbreviations in general use (*continued*):—

M.I.B.A., Member of the Institute of British Architects.

M.R.C.P., Member of the Royal College of Physicians.

M.R.C.S., Member of the Royal College of Surgeons.

M.R.C.V.S., Member of the Royal College of Veterinary Surgeons.

M.R.I., Member of the Royal Institution.

M.R.I.A., Member of the Royal Irish Academy.

MS., Manuscript.

MSS., Manuscripts.

Mus.Doc., Doctor of Music.

N.B., Mark well.

Nem. con., Without opposition.

O.H.M.S., On Her Majesty's Service.

Op. cit., The work quoted.

Per cent. (often expressed by the sign $\frac{0}{0}$ or %), By the hundred.

Ph.D., Doctor of Philosophy.

P.M., Afternoon.

Prox., The next (month).

P.S., Postscript.

Q.C., Queen's Counsel.

Qy. (?), Query, Question.

R.A., Royal Academician.—Royal Artillery.

R.E., Royal Engineers.

R.H.A., Royal Horse Artillery.

R.M., Royal Marines.

R.N., Royal Navy.

Tr., Translator.

Ult., The last (month).

v. or vide, See.

W.S., Writer to the Signet.

&, *ampersand*, and.

&c., et cetera, And so on.

2. **Abbreviations used in Prescriptions**:—

A. aa., *ana* (Greek) of each. Equally by weight or measure.

Abdom., *abdomen*, the abdomen, the belly.

Abs. febr., *absente febre*, fever being absent.

Ad 2 vic., *ad secundam vicem*, to the second time; or *ad duas vices*, for two times.

Ad gr. acid., *ad gratam aciditatem*, to an agreeable acidity.

Ad def. animi, *ad defectionem animi*, to fainting.

Ad del. an., *ad deliquium animi*, to fainting.

Ad libit., *ad libitum*, at pleasure.

Add., *adde*, or *addantur*, add, or let them be added; *addendus*, to be added.

Adjac., *adjacens*, adjacent.

Admov., *admove*, *admoveatur*, *admoveantur*, apply, let it be applied, let them be applied.

Ads. febre, *adstante febre*, while the fever is present.

Alter. hor., *alternis horis*, every other hour.

Alvo adstr., *alvo adstrictâ*, when the bowels are confined.

Aq. astr., *aqua astricta*, frozen water.

Aq. bull., *aqua bulliens*, boiling water.

Aq. com., *aqua communis*, common water.

Aq. fluv., *aqua fluviatilis*, river water.

Aq. mar., *aqua marina*, sea water.

Abbreviations used in Prescriptions (*continued*):—

Aq. niv., *aqua nivalis*, snow water.

Aq. pluv., *aqua pluviatilis*, or *pluvialis*, rain water.

Aq. ferv., *aqua fervens*, hot water.

Aq. font., *aqua fontana*, or *aqua fontis*, spring water.

Bis ind., *bis indies*, twice a day.

Bib., *bibe*, drink.

BB., *Bbds.*, *Barbadensis*, Barbadoes, as *aloë Barbadensis*.

B.M., *balneum mariæ*, or *balneum maris*, a warm-water bath.

B. P., or *B. Ph.*, British Pharmacopœia.

But., *butyrum*, butter.

B.V., *balneum vaporis*, a vapour bath.

Cærul., *cæruleus*, blue.

Cap., *capiat*, let him (or her) take.

Calom., *calomelas*, calomel, subchloride of mercury.

C. C., *cornu cervi*, hartshorn; it may also signify *cucurbitula cruenta*, the cupping-glass with scarificator.

C.C.U., *cornu cervi ustum*, burnt hartshorn.

Cochleat., *cochleatim*, by spoonfuls.

Coch. ampl., *cochleare amplum*, a large (or table) spoonful; about half a fluid ounce.

Coch. infant., *cochleare infantis*, a child's (or tea) spoonful.

Coch. magn., *cochleare magnum*, a large spoonful.

Coch. med., *cochleare medium*,
Coch. mod., *cochleare modicum*,
} a middling or moderate spoonful; that is, a dessert-spoonful — about two fluid drachms.

Coch. parv., *cochleare parvum*, a small (or tea) spoonful; it contains about one fluid drachm.

Col., *cola*, strain.

Col., *colatus*, strained.

Colet., *coletur*, *colat.*, *colatur*, let it be strained; *colaturæ*, to the strained liquor.

Colent., *colentur*, let them be strained.

Color., *coloretur*, let it be coloured.

Comp., *compositus*, compounded.

Cong., *congius*, a gallon.

Cons., *conserva*, conserve; also (*imperat. of conservo*) keep.

Cont. rem., or *med.*, *continuentur remedia*, or *medicamenta*, let the remedies, or the medicines, be continued.

Coq., *coque*, boil; *coquantur*, let them be boiled.

Coq. ad med. consumpt., *coque* or *coquatur ad medietatis consumptionem*, boil, or let it be boiled to the consumption of one half.

Coq. S. A., *coque secundum artem*, boil according to art.

Coq. in S. A., *coque in sufficiente quantitate aquæ*, boil in a sufficient quantity of water.

Cort., *cortex*, bark.

C. v., *cras vespere*, to-morrow evening.

C. m. s., *cras mane sumendus*, to be taken to-morrow morning.

C. n., *cras nocte*, to-morrow night.

Crast., *crastinus*, for to-morrow.

Abbreviations used in Prescriptions (*continued*):—

Cuj., *cujus*, of which.

Cujusl., *cujuslibet*, of any.

Cyath. theæ, *cyatho theæ*, in a cup of tea.

Cyath., *cyathus*, vel *C. vinar.*, *cyathus vinarius*, a wine-glass; from an ounce and half to two ounces and half.

Deaur. pil., *deaurentur pilulæ*, let the pills be gilt.

Deb. spiss., *debitur spissitudo*, due consistence.

Dec., *decanta*, pour off.

Decub. hor., *decubitûs horâ*, at the hour of going to bed, or at bedtime.

De d. in d., *de die in diem*, from day to day.

Deglut., *deglutiatur*, let it be swallowed.

Dej. alv., *dejectiones alvi*, stools.

Det., *detur*, let it be given.

Dieb. alt., *diebus alternis*, every other day.

Dieb. tert., *diebus tertiis*, every third day.

Dil., *dilue*, *dilutus*, dilute (thin), diluted.

Diluc., *diluculo*, at break of day.

Dim., *dimidius*, one half.

D. in 2 plo., *detur in duplo*, let it be given in twice the quantity.

D. in p. æq., *dividatur in partes æquales*, let it be divided in equal parts.

D. P., *directione propria*, with a proper direction.

Donec alv. bis dej., *donec alvus bis dejecerit*, until the bowels have been twice opened.

Donec alv. sol. fuer., *donec alvus soluta fuerit*, until the bowels have been loosened.

Donec dol. neph. exulav., *donec dolor nephriticus exulaverit*, until the nephritic pain has been removed.

D., *dosis*, a dose.

Eburn., *eburneus*, made of ivory.

Ed., *edulcorata*, edulcorated.

Ejusd., *ejusdem*, of the same.

Elect., *electuarium*, an electuary.

Enem., *enema*, a clyster.

Exhib., *exhibeatur*, let it be administered.

Ext. sup. alut. moll., *extende super alutam mollem*, spread upon soft leather.

F., *fac*, make; *fiat*, *fiant*, let it be made, let them be made.

F. pil., *fiant pilulæ*, let pills be made.

Fasc., *fasciculus*, a bundle.

Feb. dur., *febre durante*, during the fever.

Fem. intern., *femoribus internis*, to the inside of the thighs.

F. venæs., *fiat venæsectio*, let venesection be performed.

F. H., *fiat haustus*, let a draught be made.

Fict., *fictilis*, earthen.

Fil., *filtrum*, a filter.

Fist. arm., *fistula armata*, a clyster-pipe and bladder fitted for use.

Fl., *fluidus*, fluid.

F. L. A., *fiat lege artis*, let it be made by the rules of art.

F. M., *fiat mistura*, let a mixture be made.

F. S. A., *fiat secundum artem*, let it be made according to art.

Abbreviations used in Prescriptions (*continued*):—

Gel. quav., *gelatina quavis*, in any jelly.

G. G. G., *gummi guttæ gambæ*, gamboge.

Gr., *granum*, a grain; *grana*, grains.

Gr. vj pond., *grana sex pondere*, six grains by weight.

Gtt., *gutta*, a drop; *guttæ*, drops.

Gtt. quibusd., *guttis quibusdam*, with some drops.

Guttat., *guttatim*, by drops.

Har. pil. sum. iij, *harum pilularum sumantur tres*, of these pills let three be taken.

H. D., or *hor. decub.*, *horâ decubitûs*, at bedtime.

H. P., *haustus purgans*, purging draught.

H. S., *horâ somni*, at the hour of going to sleep.

Hor. un. spatio, *horæ unius spatio*, at the expiration of one hour.

Hor. interm., *horis intermediis*, in the intermediate hours.

Hor. 11mâ mat., *horâ undecimâ matutinâ*, at 11 o'clock in the morning.

Ind., *indies*, daily.

In pulm., *in pulmento*, in gruel.

Ind. Ph., Indian Pharmacopœia.

Inf., *infunde*, infuse.

Inj. enem., *injiciatur enema*, let a clyster be thrown up.

Jul., *julepus*, *julapium*, a julep.

Kal. ppt., *kali præparatum*, prepared kali (*potassæ carbonas*).

Lat. dol., *lateri dolenti*, to the affected side.

M., *misce*, mix; *mensurâ*, by measure; *manipulus*, a handful; *minimum*, a minim.

Mane pr., *mane primo*, early in the morning.

Man., *manipulus*, a handful.

Min., *minimum*, a minim, the 60th part of a drachm measure.

M. P., *massa pilularum*, a pill mass.

M. R., *mistura*, a mixture.

Mic. pan., *mica panis*, crumb of bread.

Mitt., *mitte*, send; *mittantur*, let them be sent.

Mitt. sang. ad ℥xij, *mitte sanguinem ad ℥xij*, take blood to twelve ounces.

Mod. præscr., *modo præscripto*, in the manner directed.

Mor. dict., *more dicto*, in the way ordered.

Mor. sol., *more solito*, in the usual way.

Ne tr. s. num., *ne tradas sine nummo*, do not deliver it without the money.

N. M., *nux moschata*, a nutmeg.

No., *numero*, in number.

O., *octarius*, a pint.

Ol. lini s. i., *oleum lini sine ligné*, cold-drawn linseed oil.

Omn. hor., *omni horâ*, every hour.

Omn. bid., *omni biduo*, every two days.

Omn. bih., *omni bihorio*, every two hours.

O. M., or *omn. man.*, *omni mane*, every morning.

O. N., or *omn. noct.*, *omni nocte*, every night.

Abbreviations used in Prescriptions (*continued*):—

Omn. quadr. hor., *omni quadrante horæ*, every quarter of an hour.

O. O. O., *oleum olivæ optimum*, best olive oil.

Ov., *ovum*, an egg.

Oz., the ounce avoirdupois.

P. æ., *part. æqual.*, *partes æquales*, equal parts.

P. d., *per deliquium*, by deliquescence.

Past., *pastillus*, a pastil, or ball of paste.

P., *pondere*, by weight.

Ph. D., *Pharmacopœia Dubliniensis.*

Ph. E., *Pharmacopœia Edinensis.*

Ph. L., *Pharmacopœia Londinensis.*

Ph. U.S., *Pharmacopœia of the United States.*

Part. vic., *partitis vicibus*, in divided doses.

Per. op. emet., *peractâ operatione emetici*, the operation of the emetic being over.

Pocul., *poculum*, a cup.

Pocill., *pocillum*, a small cup.

Post sing. sed. liq., *post singulas sedes liquidas*, after every loose stool.

Ppt., *præparata*, prepared.

P. r. n., *pro re nata*, occasionally.

P. rat. ætat., *pro ratione ætatis*, according to the age.

Pug., *pugillus*, a pinch, a gripe between the thumb and the two first fingers.

Pulv., *pulvis*, *pulverizatus*, a powder, pulverised.

Q. l., *quantum lubet*, } as much as you
Q. p., *quantum placet* } please.

Q. s., *quantum sufficiat*, as much as may suffice.

Quor., *quorum*, of which.

Q. V., *quantum vis*, as much as you will.

Red. in pulv., *redactus in pulverem*, reduced to powder.

Redig. in pulv., *redigatur in pulverem*, let it be reduced into powder.

Reg. umbil., *regio umbilici*, the umbilical region.

Repet., *repetatur*, or *repetantur*, let it, or them, be repeated.

S. A., *secundum artem*, according to art.

Scat., *scatula*, a box.

S. N., *secundum naturam*, according to nature.

Semidr., *semidrachma*, half a drachm.

Semih., *semihora*, half an hour.

Sesunc., *sesuncia*, half an ounce.

Sesquih., *sesquihora*, an hour and a half.

Si n. val., *si non valeat*, if it does not answer.

Si op. sit, *si opus sit*, if it be necessary.

Si vir. perm., *si vires permittant*, if the strength allow it.

Signat., *signatura*, a label.

Sign. n. pr., *signetur nomine proprio*, let it be written upon, let it be signed with the proper name (not the trade name).

Sing., *singulorum*, of each.

S. S. S., *stratum super stratum*, layer upon layer.

Abbreviations used in Prescriptions (*continued*):—

Ss., *semi*, a half.

St., *stet*, let it stand; *stent*, let them stand.

Sub fin. coct., *sub finem coctionis*, towards the end of boiling, when the boiling is nearly finished.

Sum. tal., *sumat talem*, let the patient take one such as this.

Summ., *summitates*, the summits or tops.

Sum., *sume*, *sumat*, *sumatur*, *sumantur*, take, let him or her take, let it be taken, let them be taken.

S. V., *spiritus vini*, spirit of wine.

S. V. R., *spiritus vini rectificatus*, rectified spirit of wine.

S. V. T., *spiritus vini tenuis*, proof spirit.

Tabel., *tabella*, a lozenge.

Temp. dext., *tempori dextro*, to the right temple.

T. O., *tinctura opii*, tincture of opium.

T. O. C., *tinctura opii camphorata*, camphorated tincture of opium.

Tra., *tinctura*, tincture.

Ult. præscr., *ultimo præscriptus*, last prescribed.

U.S. Ph., United States' Pharmacopœia.

V. O. S., *vitello ovi solutus*, dissolved in the yolk of an egg.

Vom. urg., *vomitione urgente*, the vomiting being troublesome.

V. S. B., *venæsectio brachii*, bleeding from the arm.

Zz., *zingiber*, ginger.

See FORMULÆ, PRESCRIPTIONS, SYMBOLS, &c.

ABDO'MEN. [Eng., Fr., L.] In *anatomy*, the belly, or lower belly; the great cavity of the body extending from the thorax, or chest, to the bottom of the pelvis. It contains the stomach, intestines, liver, spleen, kidneys, bladder, &c.; and in the female, the uterus, ovaria, &c.

AB'ERNE'THY MEDICINES. These originally consisted of a calomel pill, and subsequently of a mercurial or 'blue' pill, to be taken over-night, followed by an aromatised black draught in the morning. The quantity of either of the former, for an adult, was about 3 gr. to 3½ gr., increased a little in bulk by the addition of some liquorice powder; that of the latter, from 1 to 1½ fl. oz. As, however, when frequently taken, these pills sometimes occasioned salivation, which proved prejudicial to their sale, a little compound extract of colocynth (*Ph. L.*, 1836) was introduced into their composition, by which this objection was obviated. Ultimately, their composition was settled at 3 gr. of *mercurial pill*, and 2 gr. of *compound extract of colocynth*; and these proportions are still followed as the best by those who prepare and sell them. Persons who object to *black draught*, will find a dose of *castor oil*, or of any other mild purgative medicine that may be more agreeable to them, equally efficacious.

—, the deviation of the rays of light
ne true focus, when inflected by a lens
rulum. This arises from a difference
physical nature of the rays, from the
of the lenses or specula, or from the
of the materials of which the media
ed are composed. See ACHROMATISM,
&c.

ration of mind. Mental alienation or
ring; insanity. A term frequently ap-
in *familiar language*, to a mild form of
nt insanity or dementia, which is more
occasional or continued, trifling or
according to circumstances. The
s, nervous, slothful, and those who are
d in sedentary occupations and spend
f their time in ill-ventilated apartments,
indulge in irregular or vicious habits,
as 'fast livers,' are the most liable to
fection. It also frequently arises from
ered physical health.

at., &c. Change of scene, out-door
e, agreeable company, pleasing and con-
mental occupation, and due attention
t, clothing, ventilation, &c., with the
us use of some mild aperient medicine
pid bathing, will generally alleviate,
equently effect a cure. For the *pre-*
of its accession, or its recurrence, care
be taken to promote the general health,
o, where necessary, to elevate the spirits
divert the mind.

UTION. [Eng., Fr.] *Syn.* ABLU'TIO, L.
neral sense, washing, cleansing, or puri-
by water.

tion. In *hygiène* and *the toilet*, a
g of the whole body, or any part of it.
lue of frequent and copious affusions of
ter to the surface of the body is well

proved, that poison, already communicated, has been by cleanliness removed, before it could actually produce any bad effects. I here allude, in particular, to frequent washing, bathing, rinsing the mouth, combing and brushing the hair, and often changing the linen, clothing, and bedding." (Hufeland.) Such are the immediate effects of neglected ablution of the skin; the further consequences are of an equally serious character. The blood being deprived of one of its sources of oxygen, and one of the outlets for its carbon, the functions of nutrition become imperfect, and the animal temperature lessened. The matters which would be thrown out of the system in the form of perspiration are retained, and must be eliminated by other channels. The lungs, the kidneys, the liver, and the bowels, are each, in their turns, overtasked to perform the functions of another organ. The oppressed viscera suffer from exhaustion, and incipient disease soon follows. Their particular offices are languidly performed, the equilibrium of health is disturbed, and skin diseases, or consumption, diarrhœa, dropsy, liver-complaints, visceral obesity, or some other serious diseases of the vital organs, ensue. When it is added, that no *dirty* or *imperfectly washed skin* can *long continue healthy*, and *ceasing to be healthy* must also *cease to be agreeable* and *beautiful*, the argument in favour of the daily use of pure water to the whole surface of the body, when possible, will surely be complete.

Ablution. In *medicine*, the washing the body, *externally*, as by bathing; or *internally*, by diluting drinks. In ancient medicine, according to Galen, internal ablution was accomplished by the use of profuse libations of in any other of the lower animals. Abortion is often induced by shocks and injuries, feeding on ergotised grasses, but more commonly by causes which are less obvious. Thus, bad smells, pasturing on flooded meadows, rich and stimulating food, and even association with other cows while aborting, are among the exciting causes of this malady. The premonitory signs are an irritable excited state of the animal, a discharge from the vagina, looseness and fulness of the external organs of generation, and, occasionally, sudden enlargement of the udder. These symptoms may continue for several days, and, if noticed before straining or other signs of calving have appeared, the animal should be copiously bled and placed in a comfortable loose-box, kept as quiet as possible, moderately supplied with soft laxative food, and, if the bowels be costive, with a pound or two of treacle daily. Powerful purgatives are too irritant, and must, therefore, be studiously avoided. Two ounces of laudanum, with the same quantity of sweet spirits of nitre, should be given twice a day until all danger is over. To prevent the continuance and spread of the evil, place the cow by herself as soon as she aborts; remove and bury the fœtus beyond the reach of other cows; feed off the cow, if practicable, but if she be again bulled, it ought not to be for several weeks, and until the period of *heat* is passing off; remove all disagreeable smells, and see that the remainder of the herd are moderately fed and carefully watched, so that the earliest symptoms of abortion may be noticed.

ABRA'SION. [Eng., Fr.] *Syn.* ABRA'SIO, L. The rubbing or wearing down of surfaces by friction. In the *arts*, the reduction or figuration of materials by the use of an abrasive tool, or grinder, of which the effective portion is an exact counterpart of the form to be produced.

Abrasion. In *numismatics*, the 'wear and tear,' or waste of the substance of coins, in the pocket and circulation. It forms a large item in the expense of a metallic currency. The means employed to obviate, or to reduce it, consist in either alloying the metal to render it tougher and harder, or raising the borders so as to lessen the surface exposed to friction. In well-formed coin both methods are adopted.

Abrasion. In *pathology* and *surgery*—1. A superficial removal or injury of the skin by fretting or friction.

Treat., &c. When the injured surface is large, or exposed, it should be protected from dirt and further injury, by applying a piece of *lint* or soft *linen rag*, covered with *spermaceti cerate*, or some other simple ointment; over which a piece of strapping, or bandage of any sort, may be placed, to keep it on. In many cases, a piece of common *sticking-plaster* will be found quite sufficient.

2. A very superficial ulceration or excoriation of the intestinal or other mucous membrane. *Treat.* Aperients of castor oil, demulcents, and a light nutritious diet. See EXCORIATIONS.

ABRUS PRECATORIUS. (Ind. Ph.) Indian Liquorice Plant. *Habitat.* Tropical portions of both hemispheres. *Officinal part.* The root (*Abri Radix, Indian Liquorice*). Occurs in pieces of various lengths, from ½ to 1 inch in diameter; pale brown externally, yellowish internally; inodorous, taste sweetish and mucilaginous, much resembling officinal liquorice root. *Properties and uses.* Similar to those of liquorice, for which it forms an excellent substitute. *Preparation.* EXTRACT OF ABRUS (*Extractum Abri*). Prepared as Extractum Glycyrrhizæ.

ABSINTHE (-sŏn[*g*]t'). [Fr.] *Syn.* WERMUTH, G. See ABSINTHIUM and LIQUEURS.

ABSINTHIN. $C_{16}H_{22}O_5$. The bitter principle of wormwood (*Artemisia absinthium*). A hard crystalline solid, having an intensely bitter taste and acid properties; slightly soluble in water, very soluble in alcohol, less so in ether. Its physiological effects resemble those of extract of wormwood. *Dose.* ½ gr. to 2 gr., or more; in dyspepsia; as a stomachic, to promote the appetite, &c.; as a substitute for quinine in intermittents; and in worms.

ABSINTH'IUM. [L.] *Syns.* ABSINTHE, Fr.; WERMUTH, G.

ABSOLUTE. *Syns.* ABSOLUTUS, L.; ABSOLU, Fr.; UNDEBINGT, G. In *chemistry*, pure, unmixed; as *absolute alcohol*, pure spirit of wine, *i. e.* free from water.

ABSORBED' (-sorbd'). *Syn.* CHILLED; ABSORBÉ, Fr. In *painting*, a term, among French connoisseurs, to represent that state of a picture in which the oil has sunk into the canvas or ground, leaving the colours 'flat,' and the touches indistinct. The *remedy* consists in rubbing the surface of the picture, previously well cleaned, with a *soft sponge* dipped in a little *drying oil*, and after some days, varnishing it; when it should be kept in a warm room until perfectly dry.

ABSORB'ENT. *Syn.* ABSORB'ENS, L.; ABSORBANT, Fr.; ABSORBIREND, Ger. Imbibing; that imbibes or sucks up; variously applied in science and art. (See *below*.)

Absorbent Ground. In *painting*, a picture-ground prepared wholly or chiefly in *distemper* or *water colour*, in order that the redundant oil in the colours subsequently applied, may be immediately 'absorbed,' by which expedition is permitted, and brilliancy imparted to them.

Absorbent Surfaces. In the *arts*, these are usually rendered non-absorbent, preliminary to their being *bronzed*, *gilded*, *painted*, or *varnished*, by giving them one, or more, coats of thin *size*, so as to destroy their porosity; care being taken to allow each coat to become thoroughly dry before the application of the next one; and also, finally, to remove any unabsorbed excess of size from the surface, by means of a *sponge* dipped in *warm water*. This applies to ALABASTER, PAPER, WOOD, PLASTER CASTS, &c.; and to WALLS and CEILINGS which are not exposed to the weather, and which there is not time to prepare with drying oil. See BRONZING, MAPS, VARNISHING, &c.

Absorption and consequent *adherence* in POROUS MOULDS, as those of plaster, are usually prevented by thoroughly saturating the pores of the mould with melted *tallow*, or a *mixture of tallow* and *bees' wax;* or for DELICATE OBJECTS or the ELECTROTYPE, with *white wax*. The 'dry moulds' are either heated before the application of these substances, or they are boiled in them; any portion that may finally remain unabsorbed, being carefully removed with cotton-wool or a soft rag. *Another method*, is to wash the moulds over two or three times with *drying oil*, or to boil them in it; after which they must be exposed to the air for some days, to dry and harden. Before being used for PLASTER, COMPOSITION, &c., the surface of these prepared moulds require to be *slightly* moistened with *sweet oil*.

Plaster moulds are generally prepared for SULPHUR, WAX, and GUTTA PERCHA CASTS, by simply placing them (upright) with the back immersed in a little *water*, contained in any shallow vessel, as a saucer or plate; and letting them remain there until moisture begins to appear on the surface. The materials to be cast, or moulded, should then be used at the lowest possible temperature, to prevent the formation of air-bubbles.

The *adherence* of WAX or mixtures containing it, and of GUTTA PERCHA, is best *prevented* by moistening the surface of the mould (whether of plaster, metal, or gutta percha), immediately before use, with *soft soap* reduced to the consistence of thin cream with *water*. See CASTS, MOULDS, ELECTROTYPE, &c.

ABSORB'ENTS. In *anatomy* and *physiology*, two distinct sets of small, delicate, transparent vessels, which imbibe or suck up fluid substances, and convey them to the blood. They are termed LACTEALS OR LYMPHATICS; the former take up the chyme from the alimentary canal, the latter pervade almost every part of the body in which they absorb lymph.

Absorbents. In *botany* and *vegetable physiology*, the origins of the different vessels constituting the vascular tissue, as they are found in the root, where they imbibe or suck up the nutritive fluids from the soil. See PLANTS and VEGETABLES.

Absorbents. In *agriculture* and *chemistry*, substances which possess the power of withdrawing moisture from the atmosphere; as *soils, argillaceous earths*, &c. Also (but less frequently) substances which neutralise acids; as *chalk, lime*, and *magnesia*. Absorbents differ from 'deliquescent salts'; the *latter*, attract moisture and dissolve in it; whilst the *former*, merely suck it into their pores, as a sponge does water. See ABSORPTION.

Absorbents. *Syn.* ABSORBEN'TIA, L. In *medicine* and *pharmacy*, substances which remove acidity from the stomach and bowels. Of these the principal are—*magnesia, carbonate* and *bicarbonate of magnesia, prepared chalk*, and the *carbonates* and *bicarbonates of potash, soda*, and *ammonia*. The first four are popularly called EARTHY ABSORBENTS; and the others, ALKALINE ABSORBENTS. See ALKALINES and ANTACIDS.

ABSORP'TION. [Eng., Fr.] *Syn.* ABSORP'TIO, L.; EINSAUGUNG, Ger. The act or the power of absorbing, in various applications. (See *below*.)

Absorption. In *agriculture*, the power possessed by soils of absorbing moisture from the atmosphere. The more a soil is divided by labour and vegetation, the greater is its absorbent power, and, consequently, its fertility. Indeed, the latter chiefly depends on its capacity for imbibing moisture, and may be illustrated by reference to recent and disintegrated lava. (Leslie.) The finely divided state, most penetrable by the delicate fibres of plants, appears to derive its superior power of acting on atmospheric vapour from the augmentation of its surface and the multiplication of its points of contact. (Ure.) This method of increasing the fertility of a soil is well known to scientific farmers, and seldom neglected by them. (Loudon.) That soil must be regarded as the most fertile which possesses this power in the greatest degree. *Garden-mould* has the highest absorbent power of any mineral substance. (Leslie.)

Process of ascertaining the ABSORBENT POWER OF SOILS, *and other substances*. Thoroughly dry the article by the suitable application of a heat not exceeding 212° Fahr., continued for several hours, and transfer it, while still warm, into a *clean dry phial* furnished with a perfectly tight ground-glass stopper. When cold, quickly and cautiously introduce it, along with a delicate 'hygrometer,' into a large *wide-mouthed glass bottle*, the atmosphere of which has been previously rendered as damp as possible, by suspending a piece of moistened rag or filtering paper in it. It must now be kept closed for some hours, when the hygrometer will indicate the degree of dryness of the enclosed air, and, consequently, the 'absorbent power' of the substance examined.

Obs. Experiments of this nature are only relatively correct, and must be performed under *exactly* similar circumstances, to furnish reliable comparative results. The whole process, in each case, must be as similar as careful manipulation can possibly make them. With this reserve, they will be found invaluable to the agriculturist.

Absorption. In *chemistry*, the passage of gases and vapours into liquid and solid substances. Thus, water absorbs the oxygen of the air, lime absorbs water, charcoal absorbs ammoniacal and other gases.

Absorption. In *medicine* and *toxicology*, see Medicines and Poisons.

Absorption. In *perfumery*, see Enfleurage.

Absorption. In *physics*, see Heat, Light, Refrigeration, &c.

Absorption. In *physiology* (animal and vegetable), the function of sucking, or taking up, of appropriate substances, by the 'absorbent vessels.' It is one of the chief vital functions, the primary object of which is to convey to the circulatory organs the proper supply of the materials necessary for the support and growth of the body; and subsequently, to remove and convey to these organs its effete and useless portions, in order to their ultimate elimination from the system.

Absorption. In *surgery*, the natural process by which tumours and their contents, morbid growths, and, sometimes, even healthy glands, &c., are gradually taken up and disappear, by the action of the 'absorbents.'

Absorption (of Surfaces, Moulds, &c.). See Absorbent Surfaces.

ABSTERG'ENTS. *Syn.* Abstergen'tia, L. In *medicine* and *pharmacy*, substances which cleanse or clear away foulness from the surface of the body or sores; as *soap*, *lotions*, &c. See Detergent, which has a nearly similar meaning, and is in more general use.

AC'ARI (-rī). [L.; prim. Gr.] *Syn.* Acar'idans; Acar'ides (-dēz); Acarid'iæ (-e-ē). In *entomology*, a division of arachnidans, including the *mite* and *tick*. All the species are either microscopic or extremely minute, and possess such tenacity of life, as to resist for some time the action of boiling water, and to live with comparative impunity in alcohol. Leuwenhoek had one that lived eleven weeks glued on its back to the point of a needle, without food. The following are well known—ACARUS AUTUMNA'LIS, the *harvest-bug* or *wheal-worm*; A. DOMES'TICUS, the *domestic tick*; A. DYSENTE'RIÆ, the *dysentery-tick*; A. FARI'NÆ, the *meal mite*; A. RI''CINUS (rĭc-), the *dog-tick*; A. SAC'CHARI, the *sugar-mite*; A. SCABIE'I, the *itch-insect*; A. SI''RO, the *cheese-mite*.

The *irritation* of the skin, *caused by these vermin*, may be relieved by a lotion of equal parts of *sal volatile* and *water*; and *they may be destroyed* by *tobacco water*, or a *lotion* or *ointment of stavesacre*. See Itch, Mange, Parasites, Pediculi, Scab, &c.

ACCIDENT'AL COLOURS. See Colours (Complementary).

ACCLI'MATE, or ACCLI'MATISE. In *botany* and *zoology*, to inure a plant or animal to a climate to which it is not indigenous. When so inured it is said to be ACCLIMATED. In *medicine*, to habituate the body to a foreign climate, so that it may not be peculiarly liable to its endemic diseases; or to become so habituated. Thus, a person who has resided several years at New Orleans without an attack of yellow fever, or having had an attack has satisfactorily recovered, is said to be ACCLI'MATISED.

ACCOM'PANIMENTS. In *cookery* and *housekeeping*, see Trimmings.

ACCUMULA'TION. [Eng., Fr.] *Syn.* Accumula'tio, L. In *medicine*, a term applied when the effects of the *first* dose of any substance still continue when the *second* is administered (ACCUMULATION OF ACTION); or when several doses of insoluble substances remain inactive in the system until their energy is developed by chemical influence (ACCUMULATION OF DOSES). *See* Medicines, Poisons, &c.

ACEPH'ALANS. *Syn.* Aceph'ala, Cuv. In *malacology*, a class of aquatic mollusca, having no apparent head, but a mouth between the folds of their mantle. Several of them, as the *oyster*, *cockle*, *mussel*, *scallop*, &c., are consumed for food.

AC'ERATE (ăs'-). *Syn.* Ac'eras, L. See Aceric acid.

ACERB'ITY. *Syn.* Acerb'itas, L.; Acerbité, Fr.; Herbigkeit, Ger. In *chemistry*, &c., sourness, with bitterness and astringency, or harshness. See Cider, Fruits, Wine, &c.

ACER'IDES. Plasters that do not contain wax.

ACES'CENT. *Syns.* Aces'cens, L.; Acescent, Aigrelet, Fr.; Säurlich, Ger. In *chemistry*, &c., growing sour; slightly tart or acid; having a tendency to sourness, or to run into the acetic fermentation, as *wine*, *beer*, *malt-wort*, &c. Hence, ACES'CENCE or ACES'CENCY (*acescen'tia*, L.; *acescense*, *aigreur*, Fr.; *säurlichkeit*, Ger.), the tendency to become slightly acid, or the quality of being so. See Acetification, Malt-liquors, Wine, Wort, &c.

ACETA''RIOUS (-tāre'-e-ŭs). Used for salads (as plants); relating to salads (which *see*).

AC'ETATE (ăs'-). *Syn.* Ace'tas, L.; Acetate, Fr.; Essigsäure salze, Ger. In *chemistry*, a salt consisting of $C_2H_3O_2$ (sometimes called the acid-radical of the acetates) with hydrogen, a metal, or a compound basic radical; *e.g.*,

Hydrogen acetate (acetic acid) $HC_2H_3O_2$
Potassium acetate . . . . $KC_2H_3O_2$
Lead (plumbic) acetate . . . $Pb(C_2H_3O_2)_2$
Ammonium acetate . . . . $NH_4C_2H_3O_2$

Salts of acetic acid with the alkaloids are likewise termed acetates; *e.g.*,

Morphia acetate . $C_{17}H_{19}NO_3 . C_2H_4O_2$

Prep. That of the COMMERCIAL ACETATES, and of many others, is noticed under the respective metals. In general, they may all be formed by direct solution of the *carbonate*, *hydrate* or *oxide of the metal* whose acetate it is desired to form, in *dilute acetic acid*; or from a *solution of an acetate* and of another *salt of the metal*, by double decomposition. In either case, the resulting solution must be carefully evaporated by a gentle heat, and, when possible, crystallised.

Prop., &c. All the neutral acetates, except those of molybdenum and tungsten, are more or less soluble in water, several so much so as to be uncrystallisable; many dissolve in alcohol; they suffer decomposition at a dull red heat, and by distillation, at that temperature, yield ACETONE and water, or ACETONE and ACETIC ACID, and leave a carbonaceous residuum; at a full red-heat, those of potassium, sodium, barium, strontium, calcium, and magnesium, are converted into carbonates, whilst the other metallic acetates leave behind the pure metal, or its oxide. The aqueous solutions of the *alkaline acetates* soon turn mouldy and suffer decomposition. No more of them should, therefore, be dissolved at once than is required for immediate use.

Char., tests, &c. The acetates are known —1. By evolving fumes of *acetic acid*, recognisable by its peculiar and characteristic odour, on the addition of strong sulphuric acid:—2. By evolving the vapour of *acetic ether* (known by its peculiar and agreeable odour) when heated with a mixture of about equal parts of concentrated sulphuric acid and alcohol.

ACETATED (as′-). In *chemistry* and *pharmacy*, combined or impregnated with acetic acid or vinegar.

ACETIC. *Syn.* ACE′TICUS, L.; ACÉTIQUE, Fr. Of or relating to vinegar; made with acetic acid, as *perfumes*, &c. (See *below*.)

ACETIC ACID. $HC_2H_3O_2$. *Syn.* PYROLIG′NEOUS ACID (*pure*); ACID OF VINEGAR; ACIDUM ACE′TICUM, L.; ACIDE ACÉTIQUE, Fr.; ACIDO ACETICO, It.; ESSIGSÄURE, Ger.; AZIJNZUUR, Dut.; EISEL, Sax. When free from water it crystallizes on cooling, and is distinguished as—ACETIC HYDRATE, HY′DRATED ACETIC ACID, MONOHY′DRATED A. A., GLA′CIAL A. A., MONOHYDRATED A. A., ACE′TUM GLACIA′LE, ACIDUM ACE′TICUM G., L., &c. The sour principle of vinegar.

Var. Commercial acetic acid is found under the form of the *pure acid* of the chemist and pharmaceutist (*glacial* and *dilute*), and of *vinegar*, of which there are several varieties, which are noticed under their respective heads.

Sources. Fermented liquors; the vinegars of commerce; alcoholic liquors; wood, from which it is obtained, as pyroligneous acid, by distillation; the commercial acetates of soda, potassa, lime, lead, copper, &c. The PURE ACETIC ACID of the *chemist* and of *commerce*, is almost wholly obtained from the ACETATES, *either by the action of a strong acid*, which seizes on the base, setting the acid free; or, by *dry distillation*, in which the high degree of heat employed separates the acetic acid from the base in the form of vapour. It is also obtained by the oxidation of alcohol.

Prep. The following are the principal processes at present adopted to obtain pure acetic acid:—

I. *From* the *Acetates* in the *moist way*:—

a. From ACETATE OF SODA:—

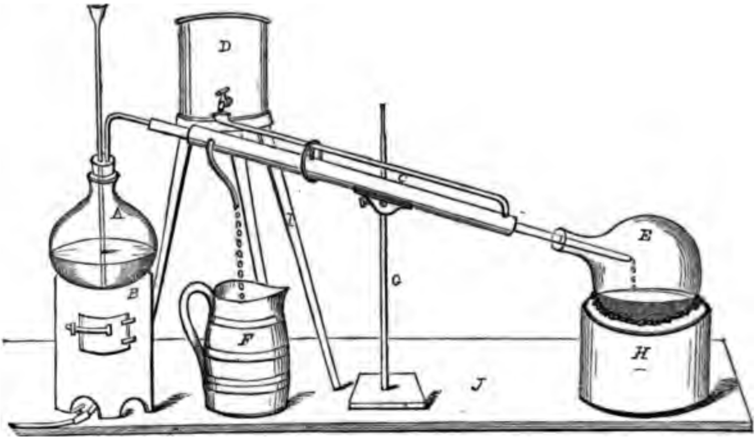
1. Commercial *acetate of soda* (i. e., the 'pure acetate' of the pyroligneous acid works), in crystals, is put into the body of a stout copper still, and a deep cavity being made in the centre of the mass, about 35% of *sulphuric acid* of a sp. gr. of not less than 1·84 is poured in; the walls of the cavity are then thrown in upon the acid, and the whole briskly agitated, for a very short time, with a large wooden spatula; the head of the still is next luted on, and the distillation conducted at a gentle heat, the receiver being changed as soon as the distillate begins to acquire a slight empyreumatic odour. The *product*, when the process is well managed, is an almost colourless acid of the sp. gr. of fully 1·05, containing about 40% of *glacial acid*, or between 34% and 35% of *anhydrous acid*. Any trace of colour or empyreuma is removed by agitation with some well-washed and recently ignited *vegetable charcoal*, or with a very small quantity of recently ignited *purified animal charcoal*, and subsequently passing it through a prepared calico bag-filter; or by allowing it to stand, for about a fortnight, in barrels containing some beech-wood chips; after which it is ready for sale, either as the ordinary ACETIC ACID or pure PYROLIGNEOUS ACID of commerce, or (on dilution, &c.) as vinegar.

2. The *acid* of sp. gr. 1·05 (obtained as above) is distilled with *fused chloride of calcium*, the distillate being run into a refrigerator; the crystals that form are drained at a temperature below 40° or 45° Fahr., and after removal to a warmer temperature, where they liquefy, and agitation with a little *peroxide of lead*, are submitted to a second distillation, as before; and this is repeated until the whole of the acid crystallises at 51° Fahr. The *product* is the GLACIAL ACETIC ACID of commerce.

Obs. The above are the processes usually adopted, on the large scale, in this country.

3. (M. Mollerat's process—*without distillation*.) Pure commercial *acetate of soda*, in coarse powder, is placed in a hard glazed stoneware or glass pan or receiver set in a cool situation, and 35% or 36% of *concentrated sulphuric acid*, of the sp. gr. 1·843, added, in such a manner that the acid may flow *under* the powder, and little heat be generated by the operation; the whole is then allowed to remain in contact (covered) for some hours, when crystalline grains of sulphate of soda are found covering the bottom and sides of the vessel, and HYDRATED ACETIC ACID, partly liquid and partly in crystals, the upper portion. The temperature being now slightly raised to a point just sufficient to cause the liquefaction of the crystals of acetic acid (*i. e.*, to from 62° to 65° Fahr.), the fluid is poured off, and a very small quantity of *pure acetate of lime* added *to it gradually*, until it ceases to yield

any trace of 'free sulphuric acid' on evaporation. After sufficient repose it is carefully decanted for use. An excellent *commercial* STRONG ACETIC ACID is thus obtained, *without distillation*, owing to the insolubility of sulphate of soda in acetic acid; and from which GLACIAL ACID may be procured by refrigeration. If, however, the process be badly managed, or the proportions of the ingredients be not carefully observed, the product will be contaminated with either a little sulphuric acid or saline matter. It is also important to the success of this process, that it be performed in a *cool apartment*, and in *well-cooled vessels*. *Perfectly pure acetic acid* may easily be obtained by rectification from this acid. The above plan of superseding a troublesome distillation is one of the greatest improvements yet introduced into the manufacture of acetic acid.



(*C.*) A Liebig's Condenser.
(The other *reference letters* are self-explanatory.)

4. (Liebig's process.) Pure *acetate of soda*, thoroughly dried and finely powdered, 3 parts, is placed in a capacious retort, and pure *concentrated sulphuric acid*, 9·7 parts, poured over it through the tubulature. One eighth of the acetic acid passes over by the heat developed by the reaction of the ingredients. The heat of a sand bath is next applied and continued until the contents of the retort become quite liquid. The distillate, carefully rectified, yields two parts of pure acid, containing only 20 per cent. of water. On exposing the latter portion which comes over in a closed vessel to a temperature below 40° Fahr., crystals of *hydrated acetic acid* are deposited. The weaker, or liquid portion, being poured off, the crystals are again melted and re-crystallised by cooling. The crystals of the last operation, separated from the liquid, and carefully drained in a cool and closed vessel, are *perfectly pure* HYDRATED ACETIC ACID.

Obs. The above is an excellent process for obtaining a chemically pure acid. The excess of sulphuric acid left from the process may be recovered by distillation; or the whole residuum may be employed in a second distillation with fresh acetate.

Although a retort is recommended by Liebig for the distillation, and is usually adopted, on the small scale, for the purpose, a flask closed by a cork perforated by two tubes, as exhibited in the *engr.*, will be found more convenient and safe; as the product is thus less likely to be contaminated by the 'spirting' of the ingredients over the brim of the vessel. The heat of a diffused gas-flame, may also be often advantageously substituted for a sand bath.

b. From ACETATE OF POTASH :—

1. *Acetate of potash* (fused and powdered) is placed in a still, or other suitable vessel, and 50% of the strongest *sulphuric acid* ('oil of vitriol' of fully 1·84 sp. gr.) being added, the mixture is distilled to dryness, as before. The product is 50 to 51% of the weight of the acetate employed, with a sp. gr. of about 1·0735 to 1·074, containing about 66% of *anhydrous acetic acid*, or nearly 80% of ordinary *glacial acid*. By rectification from a little *dried acetate of lead* a perfectly pure acid of almost any strength may be obtained. The ingredients are nearly in equiv. proportions.

c. From ACETATE OF LEAD :—

1. (Ure.) Take of *dried acetate of lead*, 4 parts; *strongest oil of vitriol*, 1 part. Distil slowly to dryness. Nearly equal to the last.

2. (Liebig.) *Acetate of lead*, 3 parts; *sulphuric acid*, 8 parts; as before.

3. (Dollfuss' *Concentrated Acetic Acid.*) Take of *dried acetate of lead*, 12 oz.; *sulphuric acid*, 6 oz.; distil 7 ounces.

d. From ACETATE OF LIME:—

1. (Christl.) Raw *acetate* or *pyrolignate of lime* (prepared by Völckel's process), 100 parts, is mixed with *hydrochloric acid* (20° Baumé, or sp. gr. 1·1515), 120 parts; and after 12 hours, distilled in a copper vessel, with a gradually applied heat. The *product* is 100 parts or *lbs.* of *acetic acid* of 8° Baumé (sp. gr. 1·0556), containing about 47% of hydrated acid, only slightly coloured and empyreumatic, fit for various manufacturing purposes. The advantage of this process is the low price of hydrochloric acid, and the product not being contaminated with sulphuric or sulphurous acid.

Obs. It will be found that *pyrolignate of lime* generally contains 60% to 70% of neutral acetate; but should it contain either more or less, a proportionate quantity must be employed. When the proper proportions are used the distillate gives only a scarcely perceptible turbid cloud when tested with nitrate of silver. If the hydrochloric acid used has the sp. gr. 1·16, a less quantity being employed, the product will have the sp. gr. of 1·058 to 1·061, and will then contain from 48 to 51% of the *monohydrate*, or 41 or 42% of *anhydrous acetic acid*. The resin sometimes found floating on the mixed ingredients should be carefully removed, by skimming, before distillation.

As acid of the above strength is rarely required, and as the distillation is more easily conducted when the ingredients are less concentrated, a little water may be conveniently added either before or towards the end of the distillation. Hence the following proportions have been recommended:—

2. (Völckel.) *Acetate of lime* (as last), 100 parts; *hydrochloric acid* (sp. gr. 1·16), 90 to 95 parts; *water*, 25 parts; mix, and proceed as before. *Prod.* 96 to 98 parts of an excellent acid, well adapted to trading purposes, having a sp. gr. about 1·050, and containing nearly 40% of *hydrated acetic acid*. It has been correctly remarked, that the acetic acid produced with hydrochloric acid, is always of better quality than that produced with sulphuric acid; being not only less coloured, but also entirely free from sulphurous acid. The distillation uniformly proceeds with ease and regularity, and the whole of the acetic acid passes over between 212° and 248° Fahr.; by which the danger of contamination with other products, resulting from a high degree of heat, is obviated.

3. An Acetic acid sufficiently strong and pure for many ordinary purposes may be obtained without distillation, by pouring *strong sulphuric acid*, 60 parts, diluted with *water*, 5 parts, on *well-dried acetate of lime*, 100 parts; digesting, with occasional agitation in a close vessel, decanting the clear liquid, and straining the remainder.

II. *From* the *Acetates* by *dry distillation* with a *sulphate*:—

a. From ACETATE OF LEAD:—

1. *Acetate of lead* (dried), 5 parts; and *sulphate of iron* (gently calcined), 2 parts; are separately powdered; and after thorough mixture, carefully distilled, by the heat of a sand bath, into a well-cooled receiver. An economical process for a strong acid, under certain circumstances; but one now seldom adopted.

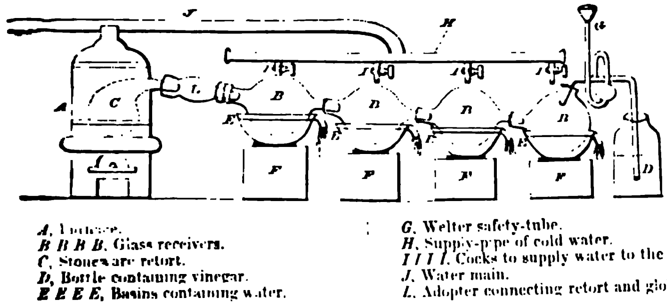
2. (Bardollier's *Strong Acetous acid.*) Dried *acetate of lead*, 10 *oz.*; *calcined green vitriol*, 12 *oz.*; as the last.

b. From the ACETATES OF COPPER:—By substituting *acetate* or *diacetate of copper*, in equiv. proportions, or better with excess of the sulphate. Seldom used.

c. From ACETATE OF POTASH, as the last.

III. From the *Acetates per se*:—

a. From ACETATE OF COPPER:—AROMATIC V.†; SPIRIT OF VERDIGRIS†; SPIRITUS VEN'ERIS†, L.; ESPRIT DE VENUS, Fr.; ACIDUM ACE'TICUM, Ph. L. 1787.) *Process.* Carefully dry *crystallised verdigris* (diacetate of copper) by a very gentle heat, and introduce it into a large stoneware retort (see *engr.*), the bottom of which has been previously coated with a mixture of *clay* and *horse-dung*, to render it more capable of standing *the fire. Next place* it in a suitable fur-



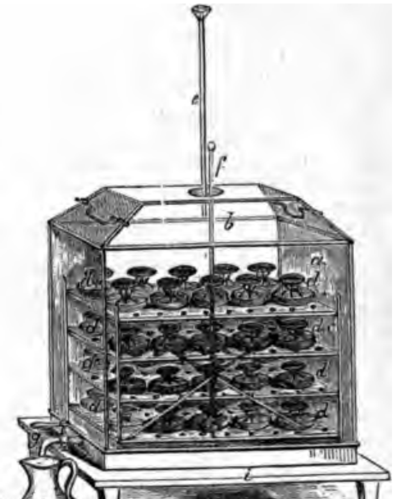
A, Furnace.
B B B B, Glass receivers.
C, Stoneware retort.
D, Bottle containing vinegar.
E E E E, Basins containing water.
F F F F, Supports for basins.
G, Welter safety-tube.
H, Supply-pipe of cold water.
I I I I, Cocks to supply water to the basins.
J, Water main.
L, Adopter connecting retort and globes.

nace, and connect it, by an adapter, with 3 or 4 double tubulated globes, the last of which must be furnished with a vertical tubulature, to which a double *Welter's safety-tube* should be adapted; the other end being immersed in a basin half-filled with *distilled vinegar* or *water*, while the funnel portion communicates with the atmosphere. Then place each globe in a basin of water, kept cool by a stream constantly passing through it; and cover the upper portion with cloths kept continually wet with *cold water*. After 15 or 20 hours, fire may be applied, and must be so regulated that the drops follow each other with considerable rapidity from the end of the adapter, whilst the bubbles of air cause no inconvenience at the other end of the apparatus. If otherwise, the fire must be damped a little. The operation should be continued, and the fire gradually increased, until vapour ceases to come over, known by the globes gradually cooling, notwithstanding the heat of the furnace. The operation being concluded, the whole may be allowed to cool, and the acid collected preparatory to rectification. This may be effected in a similarly arranged apparatus, except that it must be wholly of glass; and the retort should not be much more than half-filled. The operation must now be very carefully conducted, and discontinued before *barely* the whole of the acid has distilled over; as the last portion is apt to injure the flavour and colour of the rest. The first portions which come over are very weak, and should be kept separate, until the sp. gr. reaches to about 1·072, when the receiver should be changed, and the product collected in separate portions, as noticed below.

Obs. Good diacetate of copper yields, by careful management, at a temperature of 400° to 560° Fahr., fully one half its weight of a greenish-coloured acid, of the sp. gr. of about 1·061, containing above 50% of *hydrated acetic acid*, or 43% of *anhydrous acid*. 20 *lbs.* of the ordinary acetate yields 9¾ *lbs.* of this rough acid, leaving a residuum of about 6¼ *lbs.* of *metallic copper* mixed with a little *charcoal*, in the retort; the remainder (nearly $\frac{3}{10}$ths of the acid in the acetate) being decomposed by the heat, and lost. This 9¾ *lbs.* of crude acid yields by rectification, and dividing the products, ½ *lb.* of *acid* of the sp. gr. 1·023; 3 *lbs.* of the sp. gr. 1·042; and 6 *lbs.* of the sp. gr. 1·065; exclusive of a little *acetone* which comes over with it. In the first distillation, the strongest acid is found in the third receiver, and the weakest in the first. The acid obtained in this way is always accompanied with a little fragrant *pyro-acetic spirit;* which renders it preferable for aromatic vinegar and perfumery. It dissolves camphor, resins, and essential oils with facility. This is one of the oldest methods of obtaining glacial acetic acid, and the product is still preferred for some purposes. It is the RADICAL VINEGAR of the alchemists, and it is that which is preferred by the perfumers. Well-dried *acetate of lead*, or of *iron*, as well as several other acetates, may be substituted for acetate of copper in the above process; but are less economical and convenient. In all cases, great care must be taken to avoid *over-firing*, as thereby the quantity obtained is lessened, and the quality injured. The residuum of the distillation is *pyrophoric*, and frequently *inflames spontaneously*, on exposure to the air. Due caution must be therefore observed regarding it.

IV. *From Wood*, by *dry distillation*. See PYROLIGNEOUS ACID. The preparation of the 'purified acid,' by converting it into an acetate, and subsequent distillation with a strong acid, is noticed *above*, and under the ACETATES OF SODA, LIME, and POTASH.

V. *From Alcohol.* (ALCOHOL VINEGAR, GERMAN ACETIC ACID.) In a *bell-glass*, or an oblong *glass case*, perforated shelves are arranged, a few inches apart, one above another, on which are placed a number of small flat dishes of porcelain, earthenware, or wood. These dishes are filled with *spirit of wine* or *dilute alcohol;* and over each is suspended a watch-glass or capsule containing a portion of *platinum-black;* the whole being arranged so that the platinum-black and the surface of the alcohol are not more than 1½ to 2 inches apart. Strips of *porous paper* are next so hung in the case, that their bottom edges are immersed in the spirit, to promote evaporation; and lastly, the apparatus, loosely covered, is set in a light place at a temperature of from 70° to 90° Fahr.—the sunshine, when convenient. In a short time the temperature of the platinum rises, and the formation of *acetic acid* begins; and the condensed vapour trickles

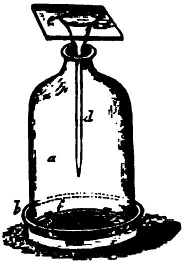


ides of the glass and collects at the
the case, whence it is removed once
day. (See *engr.*) The product of
3 cubic feet content, with 7 or 8
num-powder, is capable of producing
ell managed, nearly 1·31 *lb.* of HY-
ETIC ACID from 1 *lb.* of *absolute al-*
lbs. of *platinum-powder* and 300 *lbs.*
will, in like manner, furnish a daily
nearly 350 *lbs.* of PURE ACID, and of
igths in proportion. Theoretically,
t should be 130 parts of the hydrated
ery 100 parts of *alcohol* consumed;
s never *quite* obtained in practice,
small portion of the alcohol mixing
newly formed acid, and escaping de-
n; and from another small portion
e alcohol, and of the newly formed
eing carried off by the air that per-
e apparatus. The platinum-powder
waste, and the most *inferior* spirit
ally be employed.

In this process, the alcohol (as in
s of acetification) is first converted
yd; and this, as rapidly as formed,
ygen and passes into hydrated acetic
e simultaneous formation of aldehyd
e oxygenation of that already formed,
tected by its odour.

)uring the mutual action of the
black and the *vapour of alcohol*, the
re increases, and continues to do so
he oxygen contained in the air in-
the case is consumed, when the ace-
stops. On opening the case for a
e, to admit of a fresh supply of air,
tion recommences, thus showing its
ce on the oxygen of the atmosphere.
transmutation, 100 grains of *alcohol*
l grains (equal to 200 cubic inches) of
r about 1000 cubic inches of atmo-
r. To render the process continuous
l, a fresh supply of air must, there-
constantly provided. This may be
by either having a loosely covered
at the top of the case, and se-
h smaller ones near its lower part;
preferably) by means of two small
s passing through the lid or cover, one
terminates just below the point of in-
hilst the other divides into branches
ch to within a short distance from
m, as shown in the *engr.* In this
y slow current of fresh air will always
p in the apparatus.

tice, we find, that by loosely spread-
latinum-black on pieces of *platinum-*
d supporting these on small tripods
glass or porcelain (or even wood), the
sses and their troublesome suspension
lispensed with; as also may be the
porous paper, provided a tempera-
ot less than 90° Fahr. be maintained
se or acetifier, which may easily be
the application of artificial heat in
se of sunshine. On the large scale, a case of wood with a glass roof, or even a well-seasoned cask or vat may be employed, in which case the temperature of the apparatus must be kept up either by means of steam-pipes or flues, or by the supply of warm air. On the *small scale*, a hand bell-glass placed on a dish, with a single watch-glass or piece of platinum-gauze, and a single capsule containing alcohol, may be used, provided the bell-glass be supported on three very small wedges, to admit of a supply of air. A modification of this is sometimes employed, in which the *alcohol* is supplied, in drops, to the *platinum-black*, by means of a long, tubular funnel passing through the mouth of the bell-glass, and having its lower extremity drawn to a very fine point, as shown in the *engr.* To ensure success, the platinum-black should be either fresh-prepared, or recently washed and very gently heated, before placing it in the acetifier. 'Spongy platinum,' though ordered by many chemical compilers, does not answer well for this process.



By the above elegant and economical process, perfectly *pure acetic acid* of considerable strength may be produced from even impure alcohol; but it is impossible in this way to obtain a concentrated acid without a subsequent operation, because the action of platinum-black on absolute alcohol, or even on strong alcohol, is so violent that the platinum soon begins to glow, and inflammation ensues. Unfortunately the revenue laws of this country, until lately, stood in the way of the adoption of this beautiful process, unless *duty-paid alcohol* or *methylated spirit* be employed; but there is no statute that prevents an individual employing pure spirit, of any strength, on the small scale, for private consumption. In Germany, and in the United States of America, vinegar is manufactured on this plan, and from the low price of crude alcohol there, it will no doubt prove ultimately to be the *cheapest source* of both *pure acetic acid* and *culinary vinegars.*

VI. *Miscellaneous Formulæ:—*

1. An *excellent acetic acid*, of considerable strength, may be made by soaking fresh burnt and perfectly *dry charcoal* in *common vinegar*, and then subjecting it to distillation. The water comes over first, and on increasing the heat, the acid follows. Vinegar-bottoms and waste vinegar may be used.

2. By exposing *vinegar*, or *dilute acetic acid*, to the air in very cold weather, or to freezing mixtures, the water separates in the form of ice, and the strong acetic acid may be obtained by draining it into suitable glass vessels, observing to do so at a temperature suffi-

ciently low to keep the water solid. Said to answer well in cold climates.

3. *Acetic acid* containing 20% of water may be deprived of a good deal of its superfluous water by standing over *dry sulphate of soda.* (Liebig.) It may then be used either with or without distillation.

4. *Acetic acid,* of ordinary strength, may be concentrated to any degree, by rectification once, or oftener, from *dry acetate of potash* or *soda,* rejecting the first and last portions. The same acetate may be used repeatedly. The temperature need not exceed 400°, and must not rise above 570° Fahr.

ACETIC ACID. (B. P.) *Syn.* ACIDUM ACETICUM. Water mixed with 33% of hydrated acetic acid. Prepared by distilling acetate of soda with sulphuric acid. Colourless sour liquid. Sp. gr. 1·044.

Prop. Pure hydrated acetic acid is a thin, colourless liquid above 62° Fahr.; at 50° to 55° it crystallises in large, brilliant, colourless, transparent needles and plates, and even at 60° if a crystal of the acid be dropped in; at 40° it is a solid crystalline mass. Sp. gr.—*liquid,* 1·063 (Mollerat) to 1·0635 (Mohr);[1]—*crystallised,* 1·135 at 55° Fahr. (Ure). *Odour,* intensely pungent when concentrated, but grateful, fragrant, and refreshing, when diffused; *taste,* intensely sour and acrid, becoming agreeable and refreshing, on sufficient dilution with water; volatile; inflammable, burning with a white flame; vapour of boiling acid highly combustible; dissolves camphor, resins, gum resins, volatile oils, gelatin, gliadin, coagulated albumen, and fibrin (as muscle or the crassamentum of the blood); it coagulates casein, but not liquid albumen (as the serum of the blood and white of egg); miscible with alcohol, ether, and water in all proportions; boils at 248° Fahr.;[2] and is decomposed at a red heat. Its salts are called ACETATES (which *see*).

Char., Tests, &c.—1. Free acetic acid *reddens litmus paper,* like the other acids; and may be readily recognised by its *odour* and *volatility*:—2. Sesquichloride of iron being added, and the acid then nearly saturated with ammonia, the fluid acquires a *deep dark-red colour.*

Estim. See ACETIMETRY. *Organic mixtures* that cannot be thus tested, or from which the acid cannot be obtained by simple distillation, may be neutralised, if acid, with carbonate of lime, boiled for a few minutes, cooled, filtered, the lime precipitated with dilute sulphuric acid, and the whole submitted to distillation, when the acid contents of the distillate may be estimated as above.

Pur. By heat, it escapes (entirely) in vapour; nothing is precipitated on the addition of either hydrosulphuric acid, nitrate of silver, or chloride of barium. Sometimes it is contaminated with sulphurous acid, which may be recognised by putting a fluid drachm of the acid, mixed with an ounce of distilled water and half a drachm of pure hydrochloric acid, also a few pieces of granulated zinc, into a flask. While effervescence continues suspend a slip of white blotting-paper, moistened with solution of subacetate of lead, in the upper part of the flask above the liquid, for about five minutes. The paper should not be discoloured, and thus indicate the absence of sulphurous acid.

Adult. The acetic acid of the shops is chiefly adulterated with water. Sulphurous acid and lead are accidental contaminations; that of the latter often reaches 2%, making the acid poisonous.

Phys. eff., &c. In its *concentrated state* it is a corrosive and an acrid poison. Taken *internally,* it acts by dissolving the animal tissues, and by thus destroying the organisation, causes death, like the other acids. In the *dilute form* it acts as a stimulant, rubefacient, alterative, refrigerant, and escharotic. Its action, as a *condiment,* is noticed under VINEGAR.

Uses. Acetic acid is much employed by the *chemist* and *pharmaceutist,* in the manufacture of various preparations, and in analysis; by the *perfumer,* in the composition of several of his most refreshing and agreeable scents; and in *medicine,* as an antiseptic, stimulant, rubefacient, alterative, refrigerant, and escharotic. *Acetic acid* (B. P.) applied by means of a piece of rag tied to the end of a small stick, is a nearly certain cure for RINGWORM and SCALDHEAD—one or two applications generally effecting a cure, and the severe smarting it causes is only of short duration; as a *caustic,* it removes WARTS and CORNS; a piece of lint or blotting paper wetted with it and applied to the skin, (evaporation being prevented,) forms a useful EXTEMPORANEOUS BLISTER. It was once employed as a disinfectant; but is now only used as a *fumigation,* to disguise the unpleasant smell of the sick-room and crowded assemblies. It is a popular refreshing scent in FAINTINGS, ASPHYXIA, and NERVOUS HEADACHE; and is a valuable *rubefacient, astringent,* and *local stimulant.* It is also used as a rubefacient and caustic in *veterinary practice.*

In *the arts,* the commercial acid (pure *pyroligneous acid*) is used by the *engraver* to etch his plates; as an antiseptic in *pickling* and *preserving* animal and vegetable substances used as food, and anatomical preparations; in *dyeing* and *calico printing,* and in the manufacture of *medicated vinegars* and other pharmaceutical preparations.

In the *dilute state,* its properties and appli-

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[1] 1·064—H. M. Witt (Ure's "*Dict. of Arts, M., & M.,*" 5th ed.); 1·063 to 1·065—Muspratt ("*Chemistry, Theor. & Prac.,*" p. 2); 1·06296—Pereira (4th ed.); 1·0629—Brande; 1·062—Ure; 1·057—Berzelius ("*Jahr. ber.,*" xvi, 192):—variations evidently arising from difference of purity in the acid examined, or from difference of temperature. The sp. gr. 1·080, with other numbers given by Prof. Lehmann ("*Chemistry,*" Day's Transl.), is propably a misprint.

[2] This is the boiling-point given by the best authorities, and confirmed by Gerhardt ("*Chimie Organique,*" i, 718). Ure made it 230° (an error corrected in 5th ed.), Lehmann says 243·140, and others give it at 235°, 240°, &c. An acid of about 80% (sp. gr. 1·073 to 1·0748), its maximum density, boils at 219° to 220° Fahr.

e similar to those of ordinary vinegar,
oticed under that head.
ng from acetic acid is rare. When
ed, it is capable, by its corrosive and
tion, of perforating the coats of the
and digestive canal; and it colours
s of these organs by the chemical
xerts upon the blood. Vinegar in an
quantity acts in a similar way; but
ter degree. The *treatment* and *an-*
e similar to those directed in cases of
by the other acids.
Essise, &c. See VINEGAR.
ommentary. Acetic acid, *on the large*
rincipally prepared from 'acetate of
ich yields by a comparatively inex-
nd not a difficult operation, an acid
y strong and pure for commercial
without the necessity of rectification.
ocess shallow vessels of wood, or of
rmed without rivets or solder (except
lder') in those parts exposed to the
the acid, are generally employed for
se of the *distillation*. A coil of *drawn*
pe, heated by steam having a pressure
40 *lb.* to the inch, traverses the
the apparatus, to impart the neces-
. The *refrigeratory* consists of well-
rthenware, Berlin ware, or glass
nd the *adopter pipe* is also of the
erials. *Another common form* which
ll more convenient, is a stout copper
ished with a cast-iron jacket to hold
sure steam; the usual refrigeratory
ployed. In a *few* instances, the space
the still and jacket is filled with sand,
, or fusible metal; in which case the
is set in brickwork, and heated by
ire. *Stills* of earthenware are also
y employed; and even worms and
s of silver, or silvered copper, are
s used, and with advantage. With
worm, the product is always contami-
h a little of that metal; the efforts
anufacturer to the contrary, by the
of air, and by rejecting the first and
ons of the distillate, only lessening
preventing this evil. A *lute* (if any)
of 'linseed meal' and 'water,' with
t a little powdered 'plaster of paris,'
mployed; but flat bands and short
well-seasoned 'vulcanised Indian rub-
infinitely more convenient and effica-
he ingredients being placed in the
well but hastily stirred together with
a spatula, the head is luted on, and
llation soon afterwards commenced.
f care now should be to increase the
adually,' as the distillation proceeds;
n a steam-heat is not used, to carefully
er-firing, particularly towards the
the operation. A little *acetic ether* is
y some manufacturers. In this way
acid of the sp. gr. 1·050, is obtained
3 lbs. of 'acetate of soda' employed.
ectification be had recourse to, the ad-

dition of about 2 or 3% of *bichromate of potash*, *per-oxide of manganese*, or *red oxide of lead*, will remove empyreuma, if present. The first of these substances is the most effective; the power of the others being in the order in which they are printed. In distilling the weaker acids and vinegars, it is found useful to add from 25 to 30% of *chloride of sodium*, which, by raising the boiling-point of the liquid, allows the acid the more freely to pass over (Stein); but this addition proves disadvantageous when any sulphuric acid is present, in which case *sulphate of soda* may be employed instead. If this addition be not made, the whole of the acid cannot be obtained without distillation to dryness, and the generation of empyreuma.

On the small scale, glass retorts are usually directed to be used, but glass alembics or flasks are more convenient and safe, as already noticed. In the preparation of the *pure acid*, care should be taken that the acetate of soda does not contain common salt, as the carbonate of soda prepared by calcination, and frequently used to form the acetate, is generally contaminated with it, and yields up its hydrochloric acid or chlorine during the process of distillation, thus vitiating the product. In all the methods given, the *product* becomes *more concentrated* in proportion to the *dryness* of the acetate and the strength of the oil of vitriol or muriatic acid employed. By using the one *dry*, and the other *concentrated*, glacial acid may always be obtained by *collecting separately* the last two fifths that come over, and submitting this to refrigeration.

According to Melsens, pure GLACIAL ACETIC ACID is most advantageously obtained by distilling pure and dry *acetate of potash* with an excess of strong and moderately pure *acetic acid*, rejecting that which first passes over.

Acetate of soda may be safely dried at a temperature of 400° to 450°, provided care be taken to avoid ignition from contact with sparks. A less heat is, however, quite sufficient to drive off the *whole* of its water of crystallisation. It is known to be dry by its assuming the appearance of a smooth oily liquid whilst hot. If, whilst heated, it emits fumes, it is suffering decomposition. The same applies to the other commercial acetates. Crystallised *acetate of soda* loses about ⅖ths of its weight by thorough drying.

When *acetate of soda* and *sulphuric acid* are the ingredients employed in the production of 'acetic acid,' SULPHATE OF SODA is formed, which, in the large way, the chemist returns to the manufacturer of acetate of soda (*i. e.*, to the pyroligneous acid maker), who employs it in the decomposition of fresh acetate or pyrolignite of lime. In this way, the same soda-salt is employed over and over again, acting merely as the vehicle for the separation of the crude acetic acid in the solid form, and its easy and cheap transportation from *one point to another*. This ingenious method of mutual assistance resulting from the application of chemical science to provide for the wants of everyday life, offers some explanation of the extraordinarily low price at which acetic acid may now be purchased.

The *acetic acid* of commerce (pure *pyroligneous acid*), is almost wholly obtained from the acetates of soda and lime. The principal supply of crude acetate (*pyrolignite*) of soda is from America, Norway, and Sweden; but much is also obtained from our home manufactories. See Acetification, Acetimetry, Fermentation, Pyroligneous Acid, Sodium (Acetate of), Vinegar, &c.

More recently, acetic acid has been obtained by decomposing with hydrochloric acid the double salt of chloride of calcium and acetate of lime, mentioned by Fritzsche ('Ann. de Poggend,' xxviii, 123). For this purpose, solutions of acetate of lime and chloride of calcium are mixed and evaporated, the combined salts readily crystallising in large needles. These are freed from the mother-liquor and distilled with common muriatic acid.

The acid furnished by this method requires redistillation, and is, moreover, contaminated with some of the fatty products always present in the crude pyrolignite.

Anhydrous Acetic Acid. *Syn.* Acetic Anhydride. Acetic acid deprived of the elements of water.

Acetic Acid. Water. Acetic Anhydride.

$$2C_2H_4O_2 - H_2O = C_4H_6O_3.$$

Aromat'ic Acetic Acid. *Syn.* Aromatic vinegar; A. spirit of v.; Acidum ace'ticum aromat'icum, L.—*Prep.* 1. (Ph. E. 1839.) *Dried rosemary* and *origanum*, of each, 1 oz.; *lavender flowers*, ½ oz.; *bruised cloves*, ½ dr.; *acetic acid* (sp. gr. 1·068), 1½ pint; macerate for 7 days, express, and filter. A fragrant and refreshing perfume. Omitted in Ph. E. 1841 and P. B. 1867.

2. (Ph. E. 1817.) As the last, but using *distilled vinegar* instead of the strong acid of the Pharmacopœia. Inferior.

3. (P. Cod. 1839.) *Camphor*, 2 oz.; *oil of* lavender, 10 gr.; *oil of cinnamon*, 20 gr.; *oil of cloves*, 30 gr.; *concentrated acetic acid*, 1 pint. Very fragrant and refreshing.

4. (Ph. Bor. 1847; Cod. Med. Hamb. 1845.) *Oil of cloves*, 1 dr.; *oils of lavender* and *citron*, of each, 2 scrup.; *oils of bergamot* and *thyme*, of each, 1 scrup.; *oil of cinnamon*, 10 drops; *strongest acetic acid*, 1 oz.; mix. Limpid; yellow-brown; highly fragrant and refreshing. See Acetic Acid (Camphorated), and Vinegar (Aromatic).

Beaufoy's Acetic Acid. A superior commercial acetic acid (*i.e.*, purified pyroligneous acid), having a sp. gr. of about 1·044; or containing about 28% of real *acetic acid*, or 32 to 33% of the *hydrated acid*. Same strength, &c., as Acetic Acid P. B.

Cam'phorated Acetic Acid. *Syn.* Camphorated vinegar; Acidum ace'ticum camphora'tum, L.—*Prep.* 1. (Ph. E. 1841.) *Camphor*, ½ oz.; pulverise it by means of a few drops of *spirit of wine*, and then dissolve it in *acetic acid* (Ph. E.), 6½ fl. oz.

2. (Ph. D. 1850.) *Camphor*, 1 *oz.*; *rectified spirit*, 1 *fl. dr.*; pulverise, and dissolve in *strong acetic acid* ('acid. acet. forte' *Ph. D.*), 10 *fl. oz.*

Obs. This preparation is intended as a substitute for the 'aromatic acetic acid' of the shops and previous pharmacopœias. It is also useful as an embrocation, in rheumatism and neuralgia; as an extemporaneous vesicant and counter-irritant; and as a fumigation in fevers, &c.

Dilute' Acetic Acid. *Syn.* Acidum aceticum dilu'tum, L. *Acetic acid*, 1 pint; *distilled water*, 7 pints; mix. Sp. gr. 1·006. One fluid ounce corresponds to 16 grains of anhydrous acid (3·63 per cent.).

Glacial Acetic Acid. *Syn.* Acidum aceticum glaciale. *Acetate of soda*, 20 *oz.*, is liquefied by a gentle heat, stirred till it becomes pulverulent, and then further heated until it fuses; it is at once removed from the fire, and, when cool, the mass is broken up, placed in a 3-pint stoppered retort connected with a Liebig's condenser, and then treated with *sulphuric acid*, 8 fl. oz. When the distillation slackens, heat is to be applied, and the process continued until 6 fl. oz. of acetic acid have passed over. If a little of the product strikes a blue colour when mixed with a solution of *iodate of potassium* containing *mucilage of starch*, the whole product must be agitated with perfectly dry *black oxide of manganese*, ¼ *oz.*, and redistilled. Sp. gr. 1·065; contains 85% of anhydrous acid.

ACETIC ANHYDRIDE. See Anhydrous Acetic Acid.

ACETICA. [L.] Medicated vinegars.

ACETIFICATION. *Syn.* Acetificatio, L.; Acetification, Fr.; Essigmachen, Einsaüern, Ger. In *chemistry*, the act or process of converting into vinegar; also the state of undergoing such conversion.

Acetic acid is produced either by the partial dehydrogenation and subsequent oxidation of bodies containing its elements, or by their destructive distillation. The *first* is effected—by their exposure, in a finely divided state, to the action of air or atmospheric oxygen, as in the 'quick-process' of making vinegar; or—by submitting them, in combination with ferments, to contact with a free supply of atmospheric air, as in the old 'field-process' of making vinegar; or—by exposure to the direct action of chemical or mechanical oxidizing agents, as condensed air ('platinum-black process'), chromic and nitric acid, &c. In general, it is *alcohol* more or less dilute, particularly as it exists in fermented liquors, which is thus converted into acetic acid. In the *second process* ('destructive distillation'), *wood* is the substance usually employed, and heat is the agent which develops the acid.

The conversion of alcohol into acetic acid is not immediate and direct. The atmospheric oxygen first oxidises two atoms of its hydrogen, ALDEHYD and water being formed; and this aldehyd uniting with one atom of oxygen produces one molecule of ACETIC ACID. The changes are represented in the following equations:—

Alcohol. Oxygen. Aldehyd. Water.

$$1.\ C_2H_6O + O = C_2H_4O + H_2O$$

Aldehyd. Oxygen. Acetic Acid.

$$2.\ C_2H_4O + O = HC_2H_3O_2$$

After the first formation of aldehyd, the two processes, unless artificially checked, go on simultaneously, as long as any undecomposed alcohol is present.

The conversion of alcohol into acetic acid, although greatly accelerated by the presence of nitrogenised organic matter (according to Mulder, of a fungus—the *Mycoderma Vini* or Vinegar Plant), is rather a case of eremacausis (slow combustion) than of fermentation. Acetification effects *combination*, as shown by the foregoing equations, whereas fermentation resolves complex bodies into simpler one, *e.g.* sugar into alcohol and carbonic anhydride. Moreover, the presence of ferments is not essential to the change, since pure alcohol becomes acetified when exposed to the oxidising agents already named.

Another remarkable distinction between acetification and fermentation is, that the former requires the continued presence of atmospheric oxygen; whilst the vinous fermentation, after being once established, proceeds perfectly without it.

Pure alcohol does not acetify by itself, although it readily oxidises when present in liquids containing vegetable matter; and this, under like circumstances, occurs with greater rapidity in weak solutions than in stronger ones, because of the greater proportion of extraneous vegetable matter present in them. This is the reason why solutions of nearly pure sugar, solutions of coarse moist sugar, grape-juice, and malt-worts, when fermented, commonly suffer acetification with an increasing celerity corresponding to the order in which their names are here given; and the same applies to other liquids susceptible of this change.

During the oxidation of the alcohol of vegetable solutions, some of the other organic matters present also suffer change. A white gelatinous mass (MOTHER OF VINEGAR)[1] is commonly deposited; but this is a secondary result of the process, and not, as formerly supposed, one essential to it. In ordinary cases *acetification* occurs only at or near the surface of the liquid; which accounts for the length of time required for the operation under the old process of 'fielding;' and the shorter time in which it is accomplished by the improved process of Mr. Ham. It proceeds favorably at temperatures ranging from 60° to 90° Fahr.; and most rapidly at 95° Fahr. (Liebig). In the 'quick process' of making vinegar a temperature of 90° to 92° is generally aimed at; but it often rises to 100°, or even to 105°, Fahr. As the temperature falls acetification proceeds more slowly, and at 46° to 50° Fahr. it ceases altogether (Liebig).

Aldehyd (see *above*) is an exceedingly volatile substance, and easily dissipated by a slight heat. It is, therefore, of the highest importance to duly regulate the temperature, as well as the supply of air, during acetification. In the 'quick process' of making vinegar the loss from this cause is always considerable, and often very great. This *loss* may be *lessened* by passing the heated air, as it escapes from the 'acetifier,' through a porcelain or silvered copper worm or refrigerator, set in a chamber containing water of a temperature not higher than 40° to 45° Fahr.; the connection being made at the *lower* end of the worm, whilst the upper end is open to the air. On the *small scale*, as in the platinum-black process, the loss may be almost entirely prevented by causing the upper air-tube to pass through a vessel containing ice or a freezing mixture; or by uniting it with the lower end of a Liebig's condenser.

In liquors undergoing the vinous fermentation, a portion of the newly formed alcohol is invariably acetified whenever the temperature rises above 51° Fahr.; and at a higher temperature, this proceeds with a rapidity often highly injurious to the quality of the liquor. In this way there is frequently a useless loss of the alcohol, which is rendered more apparent by the incipient, and sometimes the actual, souring of the liquor.

ACETIM'ETRY. *Syn.* ACETOM'ETRY; ACÉTOMÉTRIE, Fr.; ACETIME'TRIA, &c., L. The art or process of determining the quantity of pure acetic acid in vinegar, or in any other liquid. The plans generally adopted for this purpose are—

I. From the *saturating power* of the *acid*, as in the common methods of acidimetry:—

1. The molecular weight of commercially pure *bicarbonate of potash*, in crystals, being 100, whilst that of absolute acetic acid is 60, it is evident that every ten grains of the 'bicarbonate' will exactly equal 6 grains of the 'acid.' To apply this practically, we have only to *exactly* neutralise 100 gr. of the *vinegar* or *solution* under examination with the *bicarbonate*, observing the usual precautions; then, as 10 is to 6, so is the number of *grains* used, to the *per-centage strength* required. In this, as in other like cases, it is convenient to form a *test-solution* with the bicarbonate, by dissolving it in sufficient water to fill the 100 divisions

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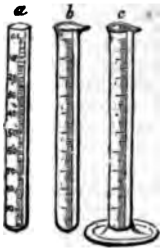
[1] It has generally been asserted that this substance contains vibriones, and other low forms of organised life; but Mulder describes it, under the name *mycoderma aceti*, as a plant of the order 'fungi.' It is formed at the expense of the constituents of the vinegar, and often causes whole vats of it to pass into water

of any simple form of 'acidimeter,' as *a*, *b*, or *c*; when the quantity of the solution, and, consequently, of the salt used, may be read off at once from the graduated portion of the tube. Still greater accuracy may be obtained by dissolving the *bicarbonate* in exactly 1000 grs. of *distilled water* contained in a 'Schuster's alkalimeter,' previously very carefully weighed; in which case *each* grain of the *test-solution* will indicate 1/10th of a grain, or 0·1% of *absolute acetic acid*, whilst every 10 grains will be equal to 1 grain, or 1%.



The *test-solution* may also be prepared from *bicarbonate of soda*, or from the *carbonates of soda* or *potash*, care being taken that the quantity of the salt dissolved be in proportion to its molecular weight.

2. (Brande.) A small piece of white marble, clean and dry, is weighed, and then suspended by a silk thread in a weighed sample (say 100 or 1000 grs.) of the vinegar or acid under examination; the action being promoted by occasionally stirring the liquid with a glass rod, until the whole of the acid is saturated, as shown by no further action on the marble being observable on close inspection. The marble is then withdrawn, washed in distilled water, dried, and weighed. The *loss in weight* which it has sustained will be nearly equal to the acetic acid present, or strictly, as 50 (*marble*) to 60 (*absolute acetic acid*). The only *precautions* required are, to avoid striking the piece of marble with the rod whilst stirring the solution, or causing loss of substance in it after its withdrawal; and to allow ample time for the action of the acid on it. If the sample consists of strong acid, it should be diluted with twice or thrice its weight of water before suspending the marble in it.

3. (Ure.) 100 grains of the sample under examination is slightly reddened with *tincture of litmus*, and ammonia of the sp. gr. 0·992 is added drop by drop (from an acetimeter holding 1000 water-gr. measure, divided into 100 divisions) until precise neutralisation is effected, indicated by the blue colour of the litmus being restored. The number of the divisions of the acetimeter used, multiplied by 60, and the *first two right-hand figures* of the *product* cut off as *decimals*, gives a number which represents the exact quantity of *absolute acetic acid* in the sample. In practice, it is found more convenient to keep the test-ammonia ready tinged with litmus.

The mode of estimating the per-centage of acetic acid in beers, when finding their original gravities, is a slight modification of the above. A *test-solution* of ammonia is prepared of such a strength that a given bulk of it will exactly neutralise one per cent. of *absolute acetic acid* in an equal bulk of beer, so that, if 10 grains of the solution are sufficient to n lise the acid in 1000 fluid grains of bee beer contains one tenth per cent. of ac solution of ammonia, diluted with di water until it has the sp. gr. ·9986 at 60 the exact strength required.

An acetimeter holding 1000 grain graduated downwards to 100 equal div is filled to 0 of the scale with the *test-nia*, which is then added, drop by dr 1000 measured grains of the beer, unti tralisation takes place. Every division acetimeter (corresponding to ten fluid g so emptied, indicates ·01 per cent. of acid in the beer. The progress of th tralisation is tested from time to time slip of reddened litmus paper, which sho suffered to become faintly blue before c to add the ammonia. By this meth exact per-centage of absolute acetic a any sample may be accurately deter The only precaution necessary is to be c that the 'test-ammonia' has the requi gr. (·9986). Test-solutions may also b pared with *pure* potash or *pure* soda.

II. From the *specific gravity* of the after it has been *neutralised* with *hyd lime*:—

Common *hydrate of lime* (freshly lime), in powder, is added gradually to th ple under examination, until it is *satu* when the sp. gr. of the resulting *clear so* of *acetate of lime* is taken by Taylor's METER. This instrument is so adjust graduated as to float at the mark on the called 'proof,' in a solution containing *absolute acetic acid* (No. 24 *vinegar*). vinegars *stronger than proof* small weigh provided, each of which indicates an addi 5 per cent. To ascertain the per-cent real acid, 5% must therefore be added acetimeter number. Thus, without loaded, the instrument, floating at the ' mark,' indicates a vinegar of 5%; wit weight, a vinegar of 10%; with *two* we 15%, and so on. According to this *sys notation*, each 5% is called a 'vinegar. acid of 10% is said to contain *two* vin one of 15%, *three* vinegars, &c. It is also mon to speak of the degrees of the aceti as *proof* or *over-proof*. Thus, No. 24 gar is said to be proof; one of 5 aceti degrees, 5 over-proof; one of 10 degre over-proof, &c. For malt and wine vin which contain gluten and mucilage, thi thod is not strictly accurate, as a porti these substances escapes precipitatio the lime, and consequently alters the s gravity. A small weight marked ' generally supplied with the acetimete trying such vinegars.

III. From the *specific gravity*:—

The sp. gr. of the *sample* (carefully mined by any of the usual methods) is s in one of the following *Tables*, when th responding *per-centage* content of *acetic acid* is at once seen.

This method furnishes reliable results only with pure, or nearly pure solutions which do not contain much above 50% of glacial acid, or which have a sp. gr. not higher than 1·062. It is also more to be depended on for *weak* solutions than strong ones. By carefully diluting a *strong acid* with an *equal weight*, or twice or *thrice* its weight of *water*, and allowing the mixture to again acquire its normal temperature, the sp. gr. may be taken as a guide in all cases in which great accuracy is not required. When such dilution is made it only becomes necessary to multiply the indication furnished in the *Tables* by 2, 3, or 4, as the case may be. As, however, authorities are not agreed as to the precise sp. gr. of the monohydrate or glacial acid, and of its solutions, extreme accuracy must not be expected by this method.

TABLE I.—*Adapted to the Specific Gravities of common vinegar.* By Messrs. J. and P. TAYLOR.

sp. gr.			per cent.
1·0085	contains of *anhydrous* or *real acetic acid*		5
1·0170	"	"	10
1·0257	"	"	15
1·0320	"	"	20
1·0470	"	"	30
1·0580	"	"	40

TABLE II.—*Exhibiting the quantity of* ABSOLUTE *or* GLACIAL ACETIC ACID ($HC_2H_3O_2$), in *acetic acid of successive strengths.* By Mr. COOLEY.

Absolute Acetic Acid, per cent.	Sp. Gr.	Absolute Acetic Acid, per cent.	Sp. Gr.	Absolute Acetic Acid, per cent.	Sp. Gr.	Absolute Acetic Acid, per cent.	Sp. Gr.
Pure acid, or 100	1·0630	75	1·0731	49	1·0593	23	1·0320
		74	1·0732	48	1·0582	22	1·0311
99	1·0648	73	1·0728	47	1·0568	21	1·0292
98	1·0663	72	1·0721	46	1·0557	20	1·0275
97	1·0677	71	1·0718	45	1·0553	19	1·0264
96	1·0685	70	1·0713	44	1·0544	18	1·0253
95	1·0696	69	1·0711	43	1·0535	17	1·0241
94	1·0704	68	1·0708	42	1·0525	16	1·0229
93	1·0708	67	1·0702	41	1·0518	15	1·0218
92	1·0715	66	1·0701	40	1·0513	14	1·0200
91	1·0721	65	1·0693	39	1·0502	13	1·0183
90	1·0726	64	1·0692	38	1·0492	12	1·0172
89	1·0729	63	1·0685	37	1·0482	11	1·0161
88	1·0730	62	1·0679	36	1·0473	10	1·0150
87	1·0731	61	1·0675	35	1·0460	9	1·0131
86	1·0732	60	1·0672	34	1·0449	8	1·0121
85	1·0733	59	1·0665	33	1·0439	7	1·0102
84	1·0734	58	1·0662	32	1·0425	6	1·0085
83	1·07343	57	1·0653	31	1·0413	5	1·0071
82	1·0735	56	1·0645	30	1·0402	4	1·0057
81	1·0738	55	1·0641	29	1·0392	3	1·0042
80	1·0743	54	1·0632	28	1·0380	2	1·0025
79	1·0742	53	1·0628	27	1·0364	1	1·0012
78	1·0740	52	1·0616	26	1·0352	*Pure water.*	1·0000
77	1·0739	51	1·0610	25	1·0341		
76	1·0736	50	1·0602	24	1·0330		

Concluding remarks. Before applying the above processes, account should be taken of any *mineral acid* which may be present in the sample, such being not unfrequently added to vinegar to impart artificial strength; and in those depending on the sp. gr., gum, gluten, &c., must also be allowed for. The methods depending on the saturating power of the acid will be found appropriate to acetic acid of all strengths, when unadulterated with the mineral acids. The *method based* on the *sp. gr.* is also very convenient, and is sufficiently accurate for distilled vinegars and for pure acids of moderate strength.

It is found that the *decimal fraction* of the sp. gr. of pure or nearly pure *vinegar*, is doubled by its conversion into acetate of lime. Thus, 1·0085 in *vinegar* becomes 1·0170 when converted into a solution of acetate of lime. In *malt vinegar*, however, 0·005 may be deducted from the sp. gr. for mucilage and gluten. The *quantity* of *foreign matter* present in *vinegar* may therefore be approximatively ascertained, by deducting the *decimal* of the sp. gr. of the *solution of acetate of lime* from *double* that of the *decimal part* of the sp. gr. of the *vinegar*. Thus:—the sp. gr. of a *sample* of *vinegar* being 1·014, and *after satu-*

ration with hydrate of calcium 1·023, the sp. gr. of the *pure* vinegar would be 1·009, and that due to foreign matter ·005. For—

$$\cdot028-\cdot023=\cdot005$$

and—

$$1\cdot014-\cdot005=1\cdot009$$

The reason why *proof-vinegar* is called, in commerce, No. 24, is that 1 *fl. oz.* of it requires exactly 24 gr. of pure *anhydrous carbonate of soda* to neutralise it. *Weaker vinegars* are represented in the same 'notation' by the Nos. 22, 20, 18, &c., according to their respective strengths estimated by their saturating power.

ACÉTOLATS. [Fr.] *Syn.* ESPRITS ACÉTIQUES. In *French pharmacy*, medicated vinegars obtained by distillation.

ACÉTOLÉS. [Fr.] In *French pharmacy*, medicated vinegars obtained by maceration.

ACETOUS FERMENTATION. See ACETIFICATION.

ACETUM. [L.] Vinegar.

ACETYL. *Syn.* ACETYLE. A name originally given to a hypothetical body, having the formula C_2H_3, and regarded by Berzelius as the radical of the acetates and their congeners. The *acetyl* of Gerhardt (C_2H_3O) is, however, according to that chemist, the true radical of the acetates. Williamson, in order to remove the confusion of terms occasioned by the application of the same name two compounds of different composition, proposed the title of *othyl* for the radical C_2H_3O.

ACHAR. See PICKLES.

ACHILLE'INE (-kĭl-). A peculiar bitter principle obtained from *achillĕ'a millefo''lium* (Linn.), or yarrow.

A'CHOR (-kŏr). [Gr.] See SCALD-HEAD.

ACHROMAT'IC (ăk-ro-). *Syn.* ACHROMATIQUE. Fr. In *optics*, devoid of colour; bodies that transmit light without decomposition, and consequently, without the formation of coloured rings or fringes; applied to compound lenses, prisms, &c., and to instruments fitted with them.

ACHRO'MATISM. *Syn.* ACHROMATISME, Fr. In *optics*, the state of being achromatic; the absence of coloured fringes in the images of objects seen through a lens or prism.

Light is not homogeneous, but decomposable by refraction, absorption, or reflection, into coloured rays of unequal refrangibility. A ray of white light, in passing through a glass prism, is entirely separated into the coloured rays forming the '*prismatic spectrum*;' and when it passes through a lens, an analogous resolution into coloured rays still occurs, though not so readily observed, and that to an extent often incompatible with distinct vision. Now, if a *convex lens* be regarded as a number of prisms united by their bases round a common centre, and a *concave lens*, as a similar number of prisms with their apices in contact, the action of lenticular and prismatic glasses on light will be reduce
common principle. A beam of light
on a simple converging lens not only
refraction at the spherical surface (SPH
ABERRATION), but the different coloure
of which it is composed, from the cause
tioned, being unequally bent or ref
diverge from their original course (CHR
ABERRATION), forming as many foci
axis of the lens as there are colours,
separately, instead of together, on the
object which receives them. Hence ar
coloured fringes or halos that surround
viewed through ordinary glasses, and
form the great impediments to the co
tion of *perfect* lenses. This effect, li
refractive power and focal distance,
in degree in different diaphanou
stances.

The *correction* of the *chromatic abe*
of *lenses* is commonly effected by com
two, or more, made of materials pos
different 'dispersive' powers. Thus, th
trum formed by *flint glass* is longer th
formed by *crown glass*, for the same de
When the two are combined, so as to
compound lens, the one tends to corr
'dispersion' of the other. On this pr
ACHROMATIC GLASSES are generally for
this country. A *convex* lens of *crown*
combined with a weaker *concave* lens
glass, the latter counteracting the dispe
the former, without materially interferi
its refractive power. The resulting
nation is not absolutely achromatic
sufficiently so for all ordinary purpose
cording to Dr. Blair, a compound le
fectly achromatic for the intermediate,
as for the extreme rays, may be made
fining certain fluids, as *hydrochloric a*
tween two lenses of *crown glass*. In o
produce nearly perfect achromatism in
ject-glasses of telescopes, microscopes, ca
&c., a *concave* lens of *flint glass* is con
placed between two *convex* lenses of *c*
plate glass, the adjacent surfaces be
mented with the purest *Canada bal*
prevent the loss of light by reflection
many surfaces.

Obs. The production of perfect achro
in lenses is a subject not less fraugh
difficulty than with practical importa
the astronomer, the mariner, the micro
and the photographer; and it has he
gaged the attention of the leading ma
ticians and artists of Europe up to the
time. All the larger object-glasses lately
factured are said to consist of only *two*
the resulting achromatism proving suffi
exact for all useful purposes. Those of
production have come chiefly from the
shops of Dollond, of London, and the o
of Bavaria and Switzerland. The *achro*
of *prisms* depends upon the same pri
and it is effected in the same way as
lenses.

up the solution to *exactly* 1000 parts by measure (*i.e.*, 1000 'water-grains' or grammes), so as to accurately fill the 100 divisions of an *acidimeter;* when the *quantity*, in grains or grammes, of the *sample tested*, bears the same proportion to the *equivalent number* of the *acid* under examination, that the *number* of *acidimeter divisions* of the *test-liquor* consumed bear to the *per-centage of acid sought*. Thus:—suppose 50 gr. of a sample of *sulphuric acid*, take 25 *acidimeter divisions* (300 parts or water-grains measure) of the *test-liquid* to neutralise it, what is its content of real acid?

The equivalent of sulphuric acid is 49 (half its atomic weight); so, by the rule of proportion,

$$50 : 49 :: 25 : 24\tfrac{1}{2}$$

It therefore contains 24½ parts of real sulphuric acid, in 50.

If the 1000 parts or grain-measures, instead of the number of the acidimeter divisions, be taken for the calculation, it will, of course, be necessary to point off the first right-hand figure of the result as a decimal. Thus; repeating the above example—

$$50 : 49 :: 250 : 24{\cdot}5$$

Or, since the *equivalent* of the *test-liquid* is 100, it will bear the same proportion to the *equiv.* of the *acid examined*, as the *number* of the *acidimeter divisions* of the test-liquid consumed in neutralising 100 gr., do to the *per-centage* sought. Thus:—50 gr. of *hydrochloric acid* take 45 *acidimeter divisions* to effect neutralisation, what is its real strength? —The *equiv.* of hydrochloric acid is 36·5: therefore—

$$100 : 36{\cdot}5 :: 45 : 16{\cdot}425\S$$

and, since only 50 gr. (instead of 100 gr.) were examined,—

$$16{\cdot}425 \times 2 = 32{\cdot}85\S$$

Some operators prefer employing 100 gr. instead of the *equivalent* weights of the given tests in making their *test-solutions*, in which case *each* gr. or 1000th part represents $\frac{1}{10}$th, and *each* acidimeter degree 1 gr. of the alkali or carbonate employed; when a similar proportion will obtain to that first above given.

In *technical analysis* it is more convenient if the *number* of *acidimeter divisions* of the 'test-liquid' consumed express the per-centage strength of the acid, *without* further calculation. For this purpose the *number* of *grains* of the *acid* taken for the assay should correspond to the *equivalent number* of such acid (see *Table* I., below); or to some convenient aliquot part of it, as the ½, ¼, ⅕, or $\frac{1}{10}$th; the per-centage answer, in the last case, being doubled, quadrupled, &c., according to the aliquot part taken. The reason of this is obvious.

For the test-solutions, ammonia, and the dry and crystallised carbonates and bicarbonates of potash and soda, are used, and are made by dissolving in water their constituents except ammonia, of which 1000 grains, or one litre, of solution of specific gravity 0·992 contains exactly one equivalent.

53 grains (or grammes) of pure anhydrous carbonate of soda, prepared by gradually heating to redness the crystallised salt, constitute one equivalent (half the atomic weight), and 69 grains (or grammes) of pure dry carbonate of potash. Of the crystallised salt 143 grains of carbonate of soda will be required, and 84 grains (grammes) of the crystallised bicarbonate of soda, and 100 of the crystallised bicarbonate of potash. Occasionally solutions containing in one thousand parts, 50 of pure carbonate of lime or chalk, or 28 of pure caustic lime, are used.

Besides these, a process known as Kiefer's is practised, and an *ammoniacal solution of oxide of copper* is employed as the 'test-liquor;' and the 'point of neutralisation' is known by the turbidity observed as soon as the free acid present is completely saturated.

The *normal solution* or *test-liquor* is prepared by adding to an aqueous solution of *sulphate of copper*, pure *ammonia water*, until the precipitate, which at first forms, is *just* redissolved, carefully avoiding excess. Or better, by adding a rather strong solution of *sulphate of copper*, to a quantity of a rather strong *solution* of *ammonia* containing exactly 17 gr., or one equiv. of *pure ammonia*, as long as the precipitate which forms is redissolved on agitation; the resulting liquid being afterwards diluted with pure *distilled water*, until it accurately measures 1000 water-grains, or fills 100 divisions of an acidimeter, at 60° Fahr. In either case, the strength of the resulting 'test-solution' must be carefully determined by means of *standard sulphuric acid*, and adjusted, if necessary.

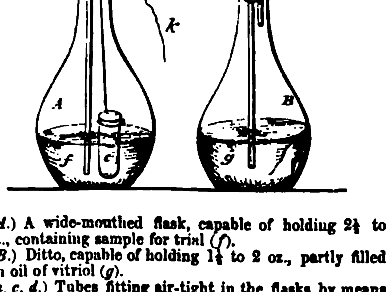
This method answers well with all the stronger acids (*excepting* oxalic acid), even when dilute; and it has the advantage of not being affected by the presence of a neutral metallic salt with an acid reaction, as sulphate of copper, or of zinc.

Besides this process a solution of lime in sugar may be used, as proposed by M. Peligot, and made as follows:—

Pure caustic lime is carefully slaked by sprinkling with water, and 50 grains (or grammes), made up by water to a milky solution, and 100 grains of pure sugar candy dissolved in 1000 grains of water, are added, and the whole well shaken. It is allowed to settle in a closed bottle, and the clear solution poured off and diluted, until 1000 grains neutralise exactly 100 grains of pure hydrochloric acid of sp. gr. 1·1812. Of course it only answers with acids whose calcium salts are readily soluble in water.

examination is capable of expelling from pure bicarbonate of soda (or of potash), which is estimated by the *loss of weight* in the acidimeter, or apparatus, after the gas, rendered perfectly dry by passing through sulphuric acid, has escaped into the air.

Oper. A determined amount of the *acid under examination* is accurately weighed into the flask *A* (see *engr.*); and if it be a concentrated acid, or a solid, it is mixed with or dissolved in 6 or 8 times its weight of *water*. The little glass tube (*e*) is then nearly filled to the brim with *pure bicarbonate of soda*, in powder, and a fine silken thread is tied round the neck of the tube, by means of which it can be lowered down into the flask (*A*), so as to remain perpendicularly suspended when the cork is placed in the latter; the cord being held between the cork and the mouth of the flask. The flask (*B*) is next about half filled with *oil of vitriol*, and the tubes being arranged in their places, as represented in the *engr.*; and time having been allowed for the mixture of acid and water to *cool completely*, after the increase of heat caused by mixing, the whole apparatus is very accurately weighed. The cork in the flask (*A*) is then slightly loosened, so as to allow the *little tube* containing the *bicarbonate of soda* to fall into the *acid*, and is again *instantly* fixed AIR-TIGHT in its place. The evolution of carbonic acid now commences, and continues until the acid in the flask (*A*) is neutralised. When this takes place, which is easily seen by no bubbles being emitted on shaking the apparatus, the flask *A* is put into hot water (120° to 130° Fahr.), and kept there, with occasional agitation, until the renewed evolution of gas has completely ceased. The little wax stopper is then taken off the tube (*a*), the apparatus taken out of the hot water, wiped dry, and suction applied, by means of a *perforated cork*, or a small *India-rubber tube*, and the mouth, to the end of the tube (*d*), until the sucked air no longer tastes of carbonic acid. The whole is then allowed to become *quite cold*, when it is replaced in the balance (the other scale still containing the original weights), and weights added to restore the equilibrium.



(*A*.) A wide-mouthed flask, capable of holding 2½ to 3 oz., containing sample for trial (*f*).
(*B*.) Ditto, capable of holding 1½ to 2 oz., partly filled with oil of vitriol (*g*).
(*a*, *c*, *d*.) Tubes fitting air-tight in the flasks by means of the corks (*i*) and (*j*).
(*b*.) Piece of wax fitting air-tight on the end of (*a*).
(*e*.) Small tube capable of holding about 1 drachm of powdered *bicarbonate of soda* or *potash*.
(*h*.) Open end of the tube (*d*).
(*k*.) Silk cord fastened to the tube (*e*).

The loss of weight represents the exact quantity of dry carbonic anhydride, or anhydrous carbonic acid gas, that has been expelled from the bicarbonate of soda, by the action of the acid in the sample examined.

The quantity of *real acid* it contained is then deduced by the following calculation:—*One equivalent* of *gaseous carbonic anhydride*, or *anhydrous carbonic acid* (= 44) bears the same proportion to *one equivalent* of the *acid* in question, as the *amount* of the *carbonic anhydride expelled* does to the *amount* of the *acid* sought. Thus, suppose a *dilute sulphuric acid* expels 3 gr. of *carbonic anhydride*, the arrangement is—

44 : 49 :: 3 : 3·349

Consequently the sample operated on contained 3·5 (nearly) grains of true sulphuric acid.

Instead of the above calculation, we may multiply the *weights* of the *respective acids* required to *expel* 1 gr. *of carbonic acid* (as exhibited in the *following* table) by the *number of gr.* of *dry carbonic acid* evolved during the above operation. The *product* represents the *per-centage strength*, when 100 gr. of the acid have been examined. When only 50, 25, 20, or 10 gr. have been tested, this product must, of course, be doubled, quadrupled, &c., as the case may be.

TABLE II.

	Multipliers.
Acetic acid (anhydrous)	1·159
„ „ (hydrated or glacial) .	1·364
Citric acid (crystallised) . . .	1·523
Hydrochloric acid (dry or gaseous)	·829
„ „ (sp. gr. 1·16) .	2·478
Nitric acid (anhydrous)	1·227
„ „ (sp. gr. 1·5)	1·523
„ „ (sp. gr. 1·42). . . .	2·045
Oxalic acid (crystallised) . . .	1·432
Sulphuric acid (anhydrous). . .	·909
„ „ (sp. gr. 1·8485) .	1·114
Tartaric acid (anhydrous) . . .	1·500
„ „ (crystallised) . . .	1·705

Even this easy calculation may be avoided, in *technical analysis*, by simply taking for the assay, such a *weight* of the *respective acids* as is capable of disengaging *exactly* 10 gr. of *dry carbonic acid* from the *bicarbonate*. In this case, the *loss of weight* in grains, from the operation, multiplied by 10, at once indicates the exact *per-centage strength* sought.

cial *oil of vitriol*, of a sp. gr. of 1·845, exactly saturate 100 gr. of *dried carbonate of soda*. An acid requiring only 35, 50, or any other number of grains of the *carbonate* to saturate it, is in like manner termed of so many degrees strong; the number of grains representing in each case an equal number of degrees. This method originated with the French chemists, and though only conventional, and principally confined to commercial purposes, is especially adapted to practical men but little conversant with chemistry, yet very ready in retaining or calculating anything on the centesimal scale, from its similarity to monetary language and reckoning.

ACID'ITY. *Syn.* Acid'itas, L.; Acidité, Fr.; Säure, Ger. In *chemistry*, the state of being acid. In *physiology*, &c., the impression given to the organs of taste by tart or acid substances. Sourness. See Fermentation, Malt-liquors, Wines, &c.

Gas'tric Acidity. Acidity of the stomach; a common and well-known symptom of weak or disordered digestion.

Treat., *&c.* Small doses of *absorbents* or *antacids*, three or four times daily, to which some tonic bitter, as *calumba*, *cascarilla*, *chamomile*, *gentian*, or *orange-peel*, may be added. Stomachic stimulants, as *capsicum*, *ginger*, *mustard*, or *wine*, &c., taken with, or after, meals, are also useful. The *diet* should be light and nutritious; and acescent vegetables, over-ripe fruit, and weak new beer or other liquors, avoided as much as possible. The *bowels* should be kept regular, but not open, by the *occasional* use of mild aperients; as *rhubarb*, *aloes*, *castor oil*, *senna*, or *mercurial pill*, or compounds containing them. Excessive looseness or diarrhœa may be checked by a few doses of *carbonate of soda*, *chalk-mixture*, or *astringents*.

In infancy this affection is usually accompanied by restlessness, continual crying, drawing up of the legs forcibly towards the body, hiccups, vomiting, diarrhœa, sour eructations, griping pains, green stools, and debility; often followed, when the irritation is considerable, by convulsions. The *treatment* consists in relieving the bowels of all offending matter by a few doses of *rhubarb-and-magnesia*. The looseness or *diarrhœa* may be checked by a few small doses of *carbonate of soda* or *chalk-mixture*; or better, in an infant which is fed, by *lime-water* (1 or 2 fl. oz.) mixed with as much milk. Two or three drops of *caraway*, *cinnamon*, *dill*, or *peppermint water*, on sugar (not with the food), will tend to promote the expulsion, and prevent the undue generation of gases. The flatulence usually disappears with the acidity. The *occasional* administration of 1 to 3 gr. of *quicksilver-with-chalk* ('gray powder'), will frequently remove the complaint, and prevent its recurrence, when all other means fail. The *diet* of both nurse and infant should be carefully regulated. See Antacids, Dyspepsia, &c.

ACIDULÆ. [L. pl.] In *medicine*, mineral waters rich in carbonic acid.

ACIDULATED. *Syn.* Acidulatus, L.; Acidulé, Fr. Blended or flavoured with an acid; made slightly sour. See Kali (Acidulated), Drops, Lozenges, &c. In *chemistry*, the addition of an acid to a neutral or alkaline liquid until it reddens blue litmus paper.

ACIDUM. [L.] An acid.

ACOLOGY. *Syn.* In *medicine*, the doctrine of, or a discourse on, remedies, or the *materia medica*.

AC'ONITE (-nīte). *Syn.* Acon'itum, L.; Aconit, Fr.; Akonitum, Eisenhut, Sturmhut, Ger. Monkshood; wolfsbane. In *botany*, a genus of exogenous plants. *Nat. ord.*, Ranunculaceæ; *Sex. syst.*, Polyandria Trigynia. They are characterised by showy purple or yellow helmet-shaped *flowers* growing in panicles, deeply cut *leaves*, and perennial (usually) tap-shaped or tapering *roots*. The whole plant is highly poisonous, the roots being more poisonous than the leaves. In *medicine* and *materia medica*, the plant Aconitum Napellus (which *see*).

Symptoms. Numbness and tingling in the mouth and throat, which are parched; followed by giddiness, dimness of sight, and (sometimes) delirium, but seldom complete coma; there is numbness and tingling of the limbs, a loss of power in the legs, (in some cases) frothing at the mouth, severe abdominal pains, nausea, vomiting, and diarrhœa; tremors or twitchings of the voluntary muscles, (sometimes) convulsions (in animals, but not in man); sharp cries; pupil (*generally*) dilated, very rarely contracted; pulse, fitful and sinking; skin, cold and livid; difficulty of breathing; general prostration; loss of sensation or feeling; insensibility, general trembling, fainting, and sudden death. The eyes are often glaring; and, in some cases, the patient is completely paralysed, yet retains consciousness to the last. The case generally proves fatal in from 1 to 8 hours. If it last beyond this period there is hope of recovery. (Fleming.)

Treatment. See Alkaloids.

ACONITE LEAVES (B. Ph.). *Syn.* Aconiti folia, L. The fresh leaves and flowering tops of *aconitum napellus*, Linn., gathered when about one third of the flowers are expanded, from plants cultivated in Britain.

Char. Leaves smooth, palmate, divided into five deeply cut wedge-shaped segments; exciting slowly, when chewed, a sensation of tingling. Flowers numerous, irregular, deep blue, in dense racemes.

Prep. Extractum aconiti.

ACONITE ROOT (B. Ph.). *Syn.* Aconiti radix, L. The dried root of *aconitum napellus*. Imported from Germany, or cultivated in Britain, and collected in the winter or early spring before the leaves have appeared.

Char. Usually from one to three inches long,

: than the finger at the crown, ta-
ckish-brown, internally whitish. A
tion, cautiously chewed, causes pro-
gling and numbness.
conitia, the active principle; Lini-
coniti, 1 ounce to 1 fluid ounce;
coniti, 54½ grains to 1 fluid ounce.

I FOLIA. See Aconite Leaves.

I RADIX. See Aconite Root.

IA. $C_{30}H_{47}O_7N$. (B. P.) *Syn.* Aco-
An alkaloid obtained from aconite.

te root, in coarse powder, 14 pounds.
ied spirit . .
led water . .
on of ammonia .
ether . . . .
d sulphuric acid
} of each a sufficiency.

on the aconite root three gallons of
mix them well, and heat until ebul-
nences; then cool and macerate for
Transfer the whole to a displace-
ratus, and percolate, adding more
en requisite, until the root is ex-
Distil off the greater part of the
n the tincture, and evaporate the
over a water bath until the whole
ohol has been dissipated. Mix the
xtract thoroughly with twice its
boiling distilled water, and when it
. to the temperature of the atmo-
er through paper. To the filtered
solution of ammonia in slight excess,
them gently over a water bath.
he precipitate on a filter, and dry it.
s to coarse powder, and macerate it
ve portions of the pure ether with
gitation. Decant the several pro-
, and distil off the ether until the
dry. Dissolve the dry extract in
lled water acidulated with the sul-
l; and, when the solution is cold,
it by the cautious addition of solu-
nmonia diluted with four times its
tilled water. Wash the precipitate
with a small quantity of cold dis-
er, and dry it by slight pressure
lds of filtering paper.
ers and Tests. A white, usually
, solid, soluble in 150 parts of cold,
hot water, and much more soluble
and in ether; strongly alkaline to
itmus, neutralising acids, and preci-
m them by the caustic alkalies, but
bonate of ammonia or the bicarbo-
oda or potash. It melts with heat,
with a smoky flame, leaving no resi-
burned with free access of air.
bed on the skin it causes a tingling
followed by prolonged numbness. It
ctive poison.

IC ACID. (Identical with *Pyroci-*
) An acid extracted by Peschier
itum napellus, and by Braconnot
tum fluviatile. It exists in these
dy in the form of aconitate of calcium.

Properties. A white, colourless, semicrystalline mass.

ACONITINA. See Aconitia.

ACONITINE. See Aconitia.

ACONI'TUM. [L.] Aconite. The pharmacopœial name of *aconitum napellus* (see *below*).

Aconitum Ferox. (Ind. P.) *Habitat.* Temperate and sub-Alpine Himalaya, at 10,000 to 14,000 feet elevation, from Gurhwal to Sikkim.

Officinal part. The dried root (*Aconiti ferocis Radix*), in common with those of other Himalayan species, viz., *aconitum napellus*, *a. palmatum*, and *a. luridum*, constitutes the drug well known in the bazaars of Upper India under the Hindostani name of *Bish* or *Bikh*.

It occurs in the form of tuberous roots of a more or less conical form, from two to three inches in length, and from half an inch to one inch in thickness at their upper end. They have usually a shrunken appearance, and are covered with a dark shrivelled bark; fracture shining and resinous; sometimes waxy, varying in colour from pale to deep brown. Some specimens are white and spongy; and these, it is asserted, are superior in activity to the more compact kinds. Inodorous; taste at first slightly bitter, leaving a peculiar sense of numbness on the tongue and fauces. Active principle, *aconitia*.

Medical properties and uses. Similar to those of *aconitum napellus* of Europe. *Preparations.* This root may be advantageously used for the manufacture of aconitia, the proportion of this alkaloid being much larger than in the European drug; and also for the preparation of Linimentum Aconiti. From its greater activity, however, it is unsuited for the preparation of this tincture, which is intended for internal use.

Aconitum Heterophyllum. (Ind. P.) *Habitat.* Western temperate Himalaya, at 8000 to 13,000 feet elevation; from Indus to Kumaon. *Officinal part.* The dried root (*Aconiti heterophylli Radix*). Ovoid tuberous roots, tapering downwards to a point, from one to one and a half inches or more in length, and from three eighths to half an inch in thickness. The surface, which is covered with a thin greyish epidermis, is slightly wrinkled longitudinally, and marked here and there with root scars. It is inodorous, and of a bitter taste, devoid of acridity. Does not contain aconitia. It may be readily distinguished from other roots sold in the bazaars under the same vernacular name (Atis) by its characteristic bitterness. *Properties.* Tonic and antiperiodic. It may be administered internally with safety, as it contains no poisonous principle. *Therapeutic uses.* In convalescence after debilitating diseases, and in intermittent and other paroxysmal fevers, it has been found an efficient remedy. *Doses.* Tonic, 5 to 10 grains thrice daily; antiperiodic, 20 to 30 grains of the powdered root every three or four hours, irrespective of the presence of pyrexia.

Aconitum Napell'us. [Linn.] *Syn.* ACONI'TUM, Ph. L., E., & D.; ACONIT NAPÈL, CHAPERON DE MOINE, Fr.; EISENHUT, BLAUER-STURMHUT, Ger. Early blue wolfsbane, or deadly aconite. *Hab.* Various parts of Europe; grows wild in England, flowering in June and July. The *fresh and dried leaves* (ACONITI FO''LIUM), Ph. L. & E. The *root* (ACONITI RA'DIX), Ph. L. & D. This is the species of aconite ordered in the pharmacopœias, and commonly used in medicine. When chewed it imparts a sensation of acrimony, followed by a pungent heat of the lips, gums, palate, and fauces, which is succeeded by a general tremor and chilliness. The juice applied to a wound or the unsound skin, affects the whole nervous system. Even by remaining long in the hand, or on the bosom, it produces unpleasant symptoms. Fatal cases of poisoning, by eating the root in mistake for horseradish, have been common of late years.

The *leaves* should be gathered as soon as the flowers appear. The *root* should be taken up in autumn. When the whole plant is employed, it should be gathered as soon as the flowers begin to open. The strength (richness in aconitia) varies considerably with the time of the year. 1 *oz.* of the 'fresh root' contains ¼ to ¾ gr. of aconitia; 1 *lb.* of the dried English root contains from 12 to 36 gr. (Herapath). The *leaves* possess the greatest activity just before flowering; the *root*, after it. The root is at all times fully *six* times as strong as the leaves or herb. The wild plant contains much more aconitia than that which is cultivated. The herb, and all its preparations, lose their efficacy if long kept. The powder, more particularly, cannot be relied on.

Properties, Antidotes, &c. See ACONITE.

Tests, &c. See ACONITE.

Uses, &c. In *small doses* aconite is narcotic, powerfully diaphoretic, and sometimes diuretic; in *larger ones*, the symptoms are similar to those produced by *aconitia*. It acts as a powerful sedative on the heart's action, and destroys sensibility without disturbing the mental faculties. It has been given in chronic rheumatism, gout, paralysis, scirrhus, scrofula, cancers, venereal nodes, epilepsy, amaurosis, intermittents, &c.; but its exhibition requires the greatest possible caution. As a *topical benumber* it has been used with great advantage in painful affections depending on increased sensibility of the nerves. Externally, it "is most valuable for the cure of neuralgic and rheumatic pains. In *neuralgia*, no remedy, I believe, will be found equal to it. One application of the tincture produces some amelioration; and after a few times' use, it frequently happens that the patient is cured. In some cases, the benefit appears almost magical. In others, however, it entirely fails to give permanent relief." "I do not think that in any (case) it proves injurious." "When it succeeds, it gives more or less relief at the *first* application. When the disease depends on inflammation, aconite will be found, I think, an unavailing remedy." "In *rheumatic pains*, unaccompanied with local swelling or redness, aconite is frequently of very great service." (Pereira, iii, 691.) *Dose*, of the *powder*, 1 to 2 gr., gradually increased to 6 or 8. Dr. Stoerk was the first who gave wolfsbane internally, about the year 1762. It has since been successfully employed in Germany in cases of chronic rheumatism, gout, &c., some of which were of long standing and had resisted every other remedy. In England it has been less extensively used.

Aconitum Panicula'tum. Panicled wolfsbane; a species formerly ordered in the Ph. L.; and, with *a. napellus*, also in the Ph. U. S. It is less active than the officinal species.

A'CORN. *Syn.* GLANS QUER'CUS, L. The seed or fruit of the oak. In the early ages of the world, acorns probably formed one of the principal articles of the food of man. (Ovid, *Met.*, i, 106; Virgil, *Georg.*, i, 8; &c.) In modern times, during periods of scarcity, they have been consumed as food on the Continent. Besides starch, they contain a peculiar species of sugar, which crystallises in prisms, and is unfermentable; they also contain tannic and gallic acids. Mannite and dulcose are the substances which it most nearly resembles. (M. Dessaignes.) During the autumn, acorns are said to be sometimes poisonous to cattle and sheep. Supposed cases of so-called acorn poisoning are best treated by withdrawing the supply of acorns, or removing the animals from the pastures on which the acorns fall, and by the administration of aperients, alkalies, and stimulants.

AC'ORUS CAL'AMUS. See SWEET FLAG.

ACOTYLE'DONS (-ko-te-lē'-). *Syn.* ACOTYLE'DONES (-dŏn-ēz; L., prim., Gr.), Jussieu; ACOTYLÉDONS, Fr.; OHNE SAMENLAPPEN, Ger. In *botany*, plants whose seeds are not furnished with distinct cotyledons or seed-lobes. *Acotyledonous plants* form one of the two great divisions of the vegetable kingdom, according to the natural system. They are remarkable by increasing chiefly in length, by additions to their end; and not by additions to the outside, as in Exogens; or to the inside, as in Endogens. They are also termed ASEX'UAL and FLOWERLESS PLANTS, and answer to the CRYPTOGAMIA of the Linnean system. See ACROGENS, CELLULARES, THALLOGENS, &c.

ACOUS'TICS (-kow'-). The science of audition and sound; that branch of *physics* which treats of their causes, nature, and phenomena. The doctrine of the production and transmission of sound is termed DIACOUS'TICS; that of reflected sound CATACOUS'TICS.

Acoustics. In *medicine*, remedies employed to relieve deafness.

AC'RID. *Syn.* AC'ER, AC'RIS, L.; ACRE (âcre), Fr.; BEISSEND, SCHARF, Ger. In *chemistry* and *medicine*, sharp, pungent, acrimonious. Acrid arts. Attempts have since been made to convert the dead bodies of cattle (carrion) into adipocere, for the purposes of the candle-maker and the soap-boiler, but without success. Besides, dead animal matter can be worked up more profitably than in making artificial adipocere.

Hatchettine or *rock-fat*, is sometimes called 'adipocere'; and *bog-butter* is a substance nearly similar to it.

AD'JECTIVE. *Syn.* Adjecti'vus, L.; Adjectif, Fr. In *dyeing*, depending on another, or on something else; applied to those *colours* which require a base or mordant to render them permanent. See Dyeing.

AD'JUVANT. [Eng., Fr.] *Syn.* Ad'juvans, L.; Aidant, &c., Fr. Assistant; helping. (As a substantive—) In *prescriptions*, see Prescribing (Art of).

Æ (ē). [L.] For words sometimes written with this initial diphthong, and not found below, look under E.

ÆGI'RINON (-jī'-). [Gr.] See Ointment.

ÆGYPTI'ACUM† (-jĭp-tī'-). [Lat.] *Syn.* Unguen'tum ægyptiacum, L. Oxymel or liniment of verdigris. The name originated with Hippocrates, who is said to have learned its composition in Egypt.

ÆOL'IPILE (-pīle). A hollow ball of metal, having a slender neck with a very small orifice, contrived to exhibit the conversion of *water* into *steam* by the action of heat, and to account for the natural production of winds. It was known to the ancients, is mentioned by Vitruvius, and was studied by Descartes and others. It has been used in *surgery* to produce *eschars*, in the same cases as moxas; the effect of the steam being limited by means of a piece of perforated pasteboard. When filled with alcohol, and the jet of vapour inflamed, it is sometimes employed as a blowpipe. M. Soyer used an apparatus of this kind to supply the heat in his portable furnace. The liquid, however, which he employed, was camphine.

A'ER (ā'-ĕr). [L., prim. Gr.] Air.

A'ERATED (ā'-ĕr-rāte-ĕd). In *chemistry*, &c., impregnated with *carbonic acid*. See Alkali, Lemonade, Waters, &c.

AE''RIAL (ā-ēre'-e-ăl). Belonging to the *air* or atmosphere; produced by, consisting of, depending on, or partaking of the nature of the *air*.

AERIFICA'TION (ā-ĕr-e-). *Syn.* Aërifica'tio, L.; Aérification, Gazéification, Fr. In *chemistry*, the conversion of a body into gas.

A'ERIFORM (ā'-ĕr-) *Syn.* Aëriform'is, L.; Aériforme, Gazéiforme, Fr.; Luftformig, &c., Ger. In *chemistry*, air-like, gaseous.

AEROL'OGY. *Syn.* Aërolo'gia, L.; Aérologie, Fr., Ger. In *physics*, a discourse or treatise of the *air*. In *physiology* and *hygiène*, the doctrine of the air, more especially with regard to its salubrity and action on organised beings.

AEROM'ETER. *Syn.* Aërome'trum, L.; Aéromètre, Fr. An instrument used in aërometry.

AEROM'ETRY. *Syn.* Aërome'tria, L.; Aérométrie, Fr.; Luftmesskunst, &c., Ger. In *chemistry* and *physics*, the art of measuring *gases*, and of determining their densities.

AERONAU'TICS. *Syn.* Aéronautique, Fr. The art of sailing in, or of navigating the *air*. See Balloons.

AEROPHO'BIA. [L.] *Syn.* Aérophobie, Fr. In *pathology*, a dread of *air* (wind); a common symptom in hydrophobia, and occasionally present in hysteria and phrenitis.

AEROSTAT'ICS. *Syn.* Aérostat'ica, L.; Aérostatique, Fr. That branch of *pneumatics* which treats of *air*, and other elastic fluids, in a state of rest.

AEROSTA'TION. [Eng., Fr.] *Syn.* Aërosta'tio, L. The art of weighing the air; aërial suspension and navigation. See Balloons.

ÆRU'GO (ē-). [L.] The rust of brass, bronze, or copper; verdigris.

ÆSCULIN. $C_{21}H_{24}O_{13}$. A crystalline fluorescent substance existing in the bark of the horse-chestnut (*æsculus hippocastanum*) and of other trees of the genera *Æsculus* and *Paria*. In the above-named sources Æsculin is associated with another fluorescent body called *Pariin*.

Æ'THER. See Ether.

ÆTHE''REA (-thērē-). [L. pl.] Ethers.

ÆSTHET'ICS (ēz-). *Syn.* Æsthet'ica, L. Medicines or agents which affect sensation. See Anæsthetics and Hyperæsthetics.

Æ'THIOPS. See Ethiops.

AFFEC'TION. [Eng., Fr.] *Syn.* Affec'tio, L. In *pathology*, a term nearly synonymous with disease.

AFFINITY. *Syn.* Chemical affinity; Affinitas, L.; Affinité, Fr.; Verwandtschaft, Ger. If oil and water be shaken together they produce no change upon one another, as is proved by their separating into two layers with their properties unaltered, when the mixture is allowed to remain at rest for a short time. Such bodies are said, in chemical language, to have *no affinity* for one another. If iodine and metallic mercury be rubbed together in a mortar they will unite in *definite proportions by weight*, and form a combination possessing *properties totally distinct from those of its constituents.* Thus, iodine is a greyish, metallic-looking solid, convertible into a violet vapour by heat, perceptibly soluble in water, and capable of producing a blue compound with starch. Mercury is a metallic, silvery looking liquid. The product of their union (*biniodide of mercury*) is a scarlet powder, destitute of metallic lustre, convertible into vapour by heat, without the production of violet fumes, insoluble in water, and incapable of developing a blue colour with starch. Again, the greenish-yellow and intensely poisonous gas, chlorine,

finite proportions by weight with
x-like, and highly poisonous metal
produce the white crystalline solid
odium (common salt), a compound
pt in very large quantities, is not
isonous, but actually beneficial to

mbinations are called *chemical*
and the force which binds their
together is distinguished from
tractive forces by the term *affinity*
ffinity. (See MIXTURE.) Bodies
ffinity are also said to have *united*

in most cases exerted between
ubstances, in which respect it
dhesion; but bodies united by
g. ink to paper, paint to wood, &c.,
united by affinity, suffer no change
n.
is exerted at immeasurable dis-
efore substances to be submitted to
must be brought into (apparently)
act. This condition is frequently
the vaporisation, fusion, or solution
ore of the bodies to be submitted
.
instances substances which have no
one another at ordinary tempera-
est this power when heated.
r *chemical union* takes place, heat
y evolved; conversely, the decom-
a chemical compound is always
d by an apparent loss of heat or
f temperature.
he most striking phenomena cha-
of, and accompanying, chemical
development of heat, change of
nd union in definite or constant
by weight.
N. In *chemistry*, the washing of a
&c., for the purpose of removing
tters. In *medicine*, affusion is of
:—
s, which consist in washing a part
with a sponge or rag soaked in a

sions, which consist in throwing
rop by drop, like rain, upon the

r baths, which consist in allowing
of small streams of water to fall
ht upon the surface of the body.
r fall from a considerable height,
hen termed *douche* by the French.
DAMP. *Syn.* CHOKE-DAMP. Car-
as resulting from explosions of air
mp (light carbonetted hydrogen) in

PAINS. Those following child-
only remedy is *patience*; they
er, be frequently alleviated by
of *morphia* or *liquor opii sedativus*.
the and warm fomentations are
useful, particularly if assisted by
but sufficient pressure on the

abdomen, by means of a broad bandage. They seldom follow with severity the first birth.

AFT'ER-WASH (-wŏsh). In the *art of the distiller*, the liquor in the still after the spirit has been drawn over.

AG'ARIC. [Eng., Fr.] *Syn.* AGAR'ICUM, AGAR'ICUS, L.; BLÄTTERSCHWAMM, PILZ, SCHWAMM, Ger. In *botany*, a genus of *fungi*, of numerous species, embracing the mushrooms and champignons. Of these plants, some are edible; others poisonous. The term is also commonly applied to the *boletus* found on oaks (TOUCHWOOD), and on larches (MALE AGARIC).

Fly-agaric. *Syn.* FLY MUSH'ROOM; AGAR'ICUS MUSCA"RIA, Linn.; AMANI'TA M. One of the most narcotic and poisonous of our fungi, producing, in *small doses*, intoxication and a pleasing species of delirium; for which purpose it is commonly employed in Kamschatka. (Hooker.) It possesses the singular property of imparting an intoxicating quality to the urine, which continues for a long time after taking it. This secretion is, therefore, commonly saved by the natives during a scarcity of the fungus. "Thus, with a few *amanitæ*, a party of drunkards may keep up their debauch for a week;" and the intoxication so produced is capable of "being propagated through five or six individuals." (Langsdorff.) Water in which it has been boiled is poisonous; but the *boiled* fungus itself is inert. The liquid from it is used as a FLY-POISON; whence the name *mushroom* is derived. It may be known by its rich orange-red colour in autumn.

AG'ATE (-āte, -ĕt‡). [Eng., Fr.] *Syn.* ACHA'TES (-kă'-tēz), L. A semi-pellucid uncrystallised species of *quartz*, remarkable for its hardness, variety of colour, and susceptibility of receiving a high polish. It is an aggregate of various siliceous minerals, of which chalcedony appears generally to be the base. Carnelian, jasper, amethyst, and other similar minerals, often enter into its composition. The colours are often delicately arranged in stripes, bands, or clouds. Those which take an angular form, as the *Scotch pebble*, are called FORTIFICATION AGATES. It is the least valuable of the precious stones, and is chiefly made into rings, seals, beads, burnishers, &c., on account of its hardness. Its *powder* is used for cleansing and polishing iron, brass, &c., and to sharpen edge-tools.

AG'NAIL. See WHITLOW.

AGRYPNOT'ICS (-grĭp-). *Syn.* ANTHYPNOT'ICS (-hĭp-); AGRYPNOT'ICA, ANTHYPNOT'ICA, L. In *medicine* and *pharmacology*, agents or substances which prevent sleep; as *tea, coffee, digitalis, vinegar*, &c.

A'GUE (-gū). See FEVER (Intermittent).

Ague-cake. The popular name of a tumour felt under the false ribs on the left side, formed by enlargement and induration of the spleen, following protracted ague; also, sometimes, of indurations of the liver following ague.

Ague-drop. See Quack Medicines.

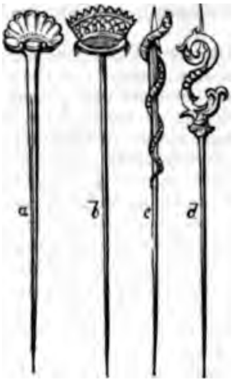
Ague-salt (-sŏlt). Disulphate of quinine.

Ague-tree. Sassafras.

Ague-weed. The herb *thorough-wort* ('Eupato″rium perfolia′tum,' Linn.).

AIG′REMORE (ĕg′r-mor). [Fr.] Pulverised *charcoal* in the state it is used to make gunpowder.

AIGUILLETTE (Attelette). [Fr.] In *cookery*, a term applied to several small dishes, from the articles of which they consist being mounted on *silver needles*, or *skewers*, with ornamental handles or tops. (See *engr.*) They form one of the varieties of the 'hors-d'œuvres' of Soyer; and are commonly served on a napkin. The *skewers* should be about four inches long, and of the thickness of an ordinary packing needle. The person eating what is served on them, takes the head of the skewer between the thumb and fingers of the left hand, and picks it off with his fork. Those noticed by Soyer are—



Attelettes from Soyer.

Aiguillettes à l'Éperlan (*smelts*);
Aiguillettes aux Huitres (*oysters*);
Aiguillettes de Filets de Sole (*soles*);
Aiguillettes de Homard (*lobsters*);
Aiguillettes de Langue de Bœuf (*ox-tongue*);
Aiguillettes de Ris de Veau (*sweetbread of veal*);
Aiguillettes de Volaille à la Jolie Fille (*fowl*);—

all of which are prepared in a nearly similar manner, merely varying the sauces, &c., to suit the article and palate. See Attelettes, Hors-d'œuvres, &c.

AIL′MENT. Pain, indisposition; disease. Its use is generally restricted to the non-acute, and milder forms of disease.

AIR. [Eng., Fr.] *Syn.* Aer, L. (from ἀήρ, Gr.); Luft, Ger.; Atmospheric Air; The Atmosphere. This name was formerly given to any aëriform body; thus, by the ol mists ammoniacal gas was called alkali oxygen,—dephlogisticated, vital, or en air; carbonic anhydride (carbonic acid air; hydrogen, inflammable air; heavy netted hydrogen (olefiant gas), heavy mable air; nitrogen,—mephitic, phlogis or nitrous air. At the present time tl air is usually restricted to the gaseou lope surrounding the solid and liquid our globe.

Atmospheric Air (or simply, The Air' air chiefly consists of a *mechanical mi* four volumes of nitrogen and one vo oxygen, or more accurately—

	By volume.		By
Nitrogen	79·1	...	7
Oxygen............	20·9	...	2
	100		10

The chief functions of the oxygen maintain respiration and support com while the office of the nitrogen is to di oxygen and control its energy.

Besides nitrogen and oxygen, aque pour, carbonic anhydride, ammonia, an acid are met with in the atmosphere, especially during and after thunder st

Vapour of water is essential to the tion of animals and plants, in order t organs concerned in this operation kept in a soft and moist condition.

Carbonic anhydride is evolved duri bustion, putrefaction, and fermentatio also a product of the respiration of and highly poisonous to them, eve diluted with large proportions of ai gas is, however, greedily absorbed by which decompose it; they assimilate t bon and return the oxygen to the atm ready to be again consumed in suppor life of the animal world.

Ammonia is derived from the putr of animal and vegetable substances from atmospheric ammoniacal compou plants obtain much of the nitrogen essential to the formation of many their structure.

Nitric acid, like ammonia, is absor its nitrogen assimilated, by plants.

In addition to the gases and vapours enumerated, as well as others which minute quantity, or which are of oc sional occurrence, Pasteur and other gators have discovered in the air livin which are capable of exciting put and fermentation, and which are co in some instances, to engender disea they are injected into the blood of In fact, the spread of infectious *e. g.*, smallpox, typhus fever, cattle &c., is attributed to the presence atmosphere of the germs of such These germs are believed to be living which develope and multiply at the

issues of the larger animals into whose
they have found entrance.

[Ar.] An *inseparable article* equiva-
the English *the*. It is found in
chemical and other words derived
e Arabic; as, *alchemy*, *alcohol*, *alembic*,
e, &c.

BASTER. *Syn.* ALBÂTRE, Fr.; ALA-
, ALABASTRI'TES, ALABAS'TRUM, L. A
ite species of calcareous and of gypseous
used by sculptors. There are several
, all of which may be ranged under
ds:—

ALCA"REOUS ALABASTER; ORIENT'AL A.;
TER. A sub-variety of carbonate of
, formed by the deposition of calcareous
s in the caverns of limestone rocks. It
liated, fibrous, or granular structure, and
soft, rich, semi-translucent whiteness,
ly agreeably variegated with undulating
r stripes of various shades of yellow,
brown. This variety is that most es-
by sculptors, and for the manufacture
aster ornaments. The ancients used it
tment and perfume boxes. At the
f San Filippo (Tuscany), the process
formation may be examined by the ob-
The natural spring of boiling water
arbonate of lime in solution by means
uretted hydrogen, which, escaping into
leaves the lime as a precipitate, which
lually deposited in a concrete form.
ex. Brogniart.)

YP'SEOUS *or* COMMON ALABASTER; GYP-
A natural hydrated sulphate of calcium,
ing a little carbonate of calcium. That
e quarries of the Paris basin contains
12$\frac{1}{2}$ of the latter substance. When cal-
r roasted, and powdered, it forms the
ce known under the name of PLASTER
RIS. The more compact, fine-grained
ns of this variety are, like the pre-
one, sculptured into almost numberless
of ornament and utility, such as vases,
tands, statuettes, &c. The inferior
nly are manufactured into the '*plaster*
is' of the shops. The best specimens are
d from the lower beds of the gypsum
s, and are white, and granular, not un-
rrara marble. It takes a high polish;
m its softness and liability to become
ured, articles formed of it require more
treatment than even those of 'cal-
s alabaster.'

baster is WROUGHT, TURNED, and
SED. in a nearly similar manner to the
varieties of marble. The tools resemble
mployed for the like operations in ivory
ass. Machinery is now often applied to
rpose.

baster is POLISHED, first with *pumice*
and then with a paste or pap made of
, *soap*, and *milk* or *water*; and lastly
y *flannel*. A better method, however, is
it first with *dried shave-grass* (equise-
nd afterwards with *finely powdered* and *sifted slaked lime* formed into a paste with *water*. The surface is then 'finished off' by friction with *finely powdered talc* or *French chalk*, until a satiny lustre is produced, or with *putty powder*, in a similar way to marble.

Alabaster is ENGRAVED with tools resembling those employed for other soft minerals. It is ETCHED by covering every part of the surface, except that to be acted on, with a solution of *white wax* in *oil of turpentine* (1 to 4,) thickened with a little *finely powdered white lead*, and subsequent immersion in *water* acidulated with *acetic acid* or *hydrochloric acid*, for the calcareous variety; and in *spring water*, for 20 to 50 hours (according to the effect desired), for the gypseous variety. The varnish is washed off with *oil of turpentine*, and the etched parts carefully brushed over with *finely powdered gypsum*.

Alabaster is JOINED and REPAIRED by means of *white of egg*, or *rice glue*, thickened with *finely powdered quicklime*; or by a paste of newly baked and *finely powdered gypsum*, mixed up with the least possible quantity of *water*.

Calcareous alabaster is usually CLEANED with a brush and warm *soap-and-water*, or with *tepid water* to which a few grains of *carbonate of soda* or of *ammonia* has been added; followed in either case by rinsing in *clean water*. Delicate objects in *gypseous alabaster* can only be safely cleaned with *benzol*, or with *pure oil of turpentine*. If necessary, the surface must be repolished. GREASE SPOTS may be removed from either variety with a little *benzol* or *oil of turpentine*.

Alabaster is occasionally STAINED or COLOURED, and, for the calcareous variety, in a similar way to marble, except that heat is not employed; and for the gypseous variety, in the manner noticed under PLASTER OF PARIS. The gypseous variety is also BRONZED and HARDENED in a similar way to that adopted for casts in the latter substance.

Obs. Gypseous alabaster is dissolved by water; and the beauty of both varieties is almost irrecoverably destroyed by grease, coloured oils, varnishes, smoke, &c. It is, therefore, unfitted for garden ornaments, or other objects exposed to the rain or weather, unless it be painted or bronzed; and is even then very perishable. Contact with acids, alkalies, and ammoniacal and sulphurous fumes, also injure, and, if prolonged, destroy it. Even an uncorked phial of smelling-salts placed on a mantel-piece beside an alabaster vase, will soon destroy its beauty. Thus, all delicate objects in alabaster should be protected by a glass shade.

Orient'al Alabaster (Factitious). *Figures*, *basso relievos*, &c., of considerable hardness and beauty, may be formed by imitating the process adopted at the Baths of San Filippo, before referred to.

Proc., &c. Moulds of *sulphur* are placed either vertically or obliquely in an open tub or cistern, having a freely perforated bottom. Surmounting the whole are two or more pieces of wood in the form of a cross or star. The *sulphurous calcareous water*, falling on this cross, is scattered into spray or streamlets, and losing the gaseous portion which holds the lime in solution, deposits it in the form of ORIENTAL ALABASTER on the surface of the moulds. In from 1 to 4 months, according to the nature of the article, a sufficiently thick deposit is obtained. The object is then removed from the mould, and trimmed and polished. It is found that the more *vertical* the position of the mould, the finer is the grain of the resulting deposit. The water of the Spring of San Filippo may be exactly and easily imitated by the chemist; and the whole process offers a new and valuable ornamental art for the amusement and profit of the ingenious and enterprising.

ALAMODE' (ăl-ăh-mōdé.) [Fr., *à la mode*.] According to the prevailing mode or fashion. In *cookery*, applied to several dishes, but more particularly to one of beef (ALAMODE BEEF), commonly shortened by the lower class of Londoners into "*alamode*." See BEEF, STEWS, &c.

ALAN'TINE. [Eng., Fr., Ger.] *Syn.* ALANTI'NA, L. A substance identical with inulin, found in the roots of *garden angelica* ('angelica archangelica,' Linn.).

ALBA'TA. [L., Eng.] A name given to several alloys resembling silver. See ALLOYS, GERMAN SILVER, &c.

ALBU'MEN. [Eng., L.] *Syn.* ALBUMIN; ALBUMINE, Fr.; EIWEISS, EIWEISSTOFF, Ger. Literally, the white of egg; a peculiar nitrogenous substance which enters largely into the composition of animal bodies. It abounds in the blood, muscles, bones, coagulable lymph, vitreous and crystalline humour of the eye, fluid of dropsy, &c. The white of egg consists of nearly pure albumen dissolved in water.

A substance identical with albumen is found in many vegetables. It enters largely into the composition of all the emulsive seeds. According to Seguin, it exists in considerable quantity in all those vegetables and fruits that afford a vinous liquor without the addition of yeast.

Prep. The white of egg and the serum of blood, when strained through muslin, furnish albumen, in solution, in a sufficiently pure state for all the ordinary purposes of the arts. Pure SOLID ALBUMEN may be prepared as follows:—

1. Agitate strained white of egg with 10 or 12 times its bulk of alcohol, collect the precipitated flocculi on a muslin filter, and suffer it to dry at a temperature not exceeding 120° Fahr.

2. Add a little water to white of egg, mix, filter, exactly neutralise with acetic acid, and then largely dilute with pure cold water; the precipitate which falls may be collected on a filter and washed. Strained serum of blood may be used instead of white of egg, in both the above forms.

Comp., *&c.* The following is the composition of albumen according to Lieberkühn:—

Carbon	53·3
Hydrogen	7·1
Nitrogen	15·7
Oxygen	22·1
Sulphur	1·8
	100·

Chatin found iodine in the white of e
it also contains chloride, sulphate, p
phate, and carbonate of sodium, phosph
of calcium, and traces of potassium in
but, unlike the sulphur, none of these s
stances form a constituent part of pure alb
men, though probably always present in wh
of egg.

Prop. Pure solid albumen (unaltered
heat) is nearly colourless, inodorous, and tas
less; scarcely soluble in water, but read
so in water containing an exceedingly sm
quantity of caustic soda or potash, and in
strong solution of nitrate of potassium. Wh
dried by a gentle heat it shrinks into a tran
lucent horny mass; and when exposed to
sufficient temperature, yields the usual amm
niacal odour and products of animal matt
Its solution (as white of egg) is solidified
coagulated by a heat of from 145° to 16
Fahr., forming a white, opaque mass; wh
very dilute, on boiling (only) it separates
fine light flocks. When thus coagulated, it
insoluble in water at a less temperature th
302° Fahr. (Wöhler and Vögel), unless alk
lised. Ordinary solutions of albumen give pr
cipitates with sulphuric, hydrochloric, nitri
and metaphosphoric acids, with tannin a
astringent solutions, and with most of t
metallic salts; but are not affected by eith
acetic acid or tribasic (common) phosphor
acid. Alcohol, in quantity, also precipitat
albumen. Strong oil of vitriol turns
black in the cold, but on applying a gent
heat, a gorgeous, red-coloured liquid is pr
duced. Strong hydrochloric acid gives
deep violet-blue solution. White of egg
serum exposed in a thin stratum to the a
dries up into a pale, yellow, gum-like su
stance, and in this state may be kept for a
length of time, retaining its property of r
dissolving when immersed in slightly war
water.

Tests.—1. Both heat and alcohol (or stron
spirit) coagulate it:—2. A solution of perchl
ride of mercury dropped into a fluid contai
ing albumen occasions a white precipitate:-
3. Subacetate of lead acts in the same wa
Either of the last two will render turbid
solution containing only the 1-2000th part
fresh white of egg, or the 1-10,000th part
dry albumen:—4. Tannin and tincture of gal
give yellow, pitchy precipitates:—5. If d
caustic potash or soda be triturated wit
either liquid or solid albumen, ammoniac
fumes are evolved, and the mixture on ca
cination yields ferrocyanide of potassium:-
6. Its coagulability by heat, and its inc

antimony used by Oriental ladies to paint their eyebrows. In course of time this term was applied to other fine powders, and ultimately to highly rectified spirits.

Hist., &c. Although the art of distillation was probably known at a comparatively early age of the world, the preparation of pure rectified spirit is a discovery of modern times. It was not until the 13th century, that Raymond Lully first showed the way to concentrate spirit by means of *carbonate of potash;* after which date pure concentrated spirit gradually rose into note as an article of trade and commerce in Europe. In the 16th century its distillation was in common practice in these countries. (Burns.) By means of *chloride of calcium*, Dr. Black obtained alcohol of sp. gr. 0·800 (*about* A.D. 1760); and Richter afterwards procured it of a sp. gr. so low as 0·796 at 60° Fahr. (Crell's 'Annals,' 1796.) Lavoisier first demonstrated the composition of alcohol (*about* 1780). Its analysis was subsequently perfected by M. Saussure, jun., and confirmed by MM. Dumas and Boullay, and Gay-Lussac; and by many others since.

Nat. hist. Alcohol is peculiar to the organic kingdom, being exclusively produced, in the natural way, by the process of fermentation.

Sources, &c. Dilute alcohol may be procured, by the ordinary process of distillation, from all fermented liquors. When drawn from wine (as in France), it constitutes BRANDY; when from the refuse juice of the sugar-cane, it is called RUM; when from malt, grain, or molasses (as in England), it is called MALT, RAW-GRAIN or MOLASSES SPIRIT; and when from rice or palm-wine, ARRACK. Brandy, rum, Hollands, and whiskey, contain only about half their volume of alcohol; and gin much less. When distilled from any of these spirituous liquors, the alcohol contains, besides water, variable quantities of essential oils, ethers, and other flavouring matters, which, by one or more redistillations with charcoal or lime, it for the most part loses, and then becomes commercial spirit of wine. By a further rectification from chloride of calcium, lime, carbonate of potash, or any other substance having a strong affinity for water, the water is retained, and a strong spirit passes over containing not more than 10 per cent. of water. By repeating the process, and using the proper precautions, it may be obtained almost entirely free from water, and is then called absolute or anhydrous alcohol.

Preparation I. Of *Absolute Alcohol*:—

a. Alcohol (highly rectified spirit), of 85% (sp. gr. ·835 to ·822), is mixed, in a tubulated retort, with about half its weight of fresh-burnt quick-lime, in coarse powder; and the whole, after securely stopping the neck with a cork, and agitation, is allowed to repose for several days. The alcohol is then carefully distilled off, drop by drop, by the heat of a water bath, until the weight of the distillate nearly equals that of the 'anhydrous alc
in the spirit operated on. The sp. gr. o
product should be ·795 or ·796; but by
fully repeating the process with the dist
and a fresh quantity of lime, and prolo
the last digestion with the latter for se
weeks, *absolute alcohol* of the sp. gr. ·7
at 60° Fahr. may be easily obtained.

b. (Drinkwater; Fownes.) The stro
rectified spirit of wine is digested in a
pered bottle for several days, with about
its weight of anhydrous carbonate of po
in powder, frequent agitation being ha
course to; the alcohol, after repose, is
decanted, and treated with sufficient f
burnt quick-lime to absorb the whole o
spirit. After 48 hours' digestion, the s
when distilled, will have the sp. gr. ·7
60° Fahr.

c. (Liebig; Ure.) Alcohol of about 9
saturated with fused chloride of calciu
powder, and after repose for a few hours
stoppered bottle, is submitted to distill
as before. The product should nearly
the quantity of dry alcohol in the sa
Ure recommends equal weights of the
and chloride to be taken; and the proce
be stopped as soon as about half the vo
of the spirit employed has passed over, o
distillate acquires a higher sp. gr. than
at 68°, or ·796 at 60° Fahr.

d. (B. P. 1867.) Take of *rectified s*
1 pint; *carbonate of potash*, 1½ ounce; *s*
lime, 10 ounces. Put the carbonate of p
and spirit into a stoppered bottle and
them to remain in contact for two days
quently shaking the bottle. Expose the s
lime to a red heat in a covered crucibl
half an hour, then remove it from the
and, when it has cooled, immediately pu
lime into a flask or retort, and add to i
spirit from which the denser aqueous sol
of carbonate of potash, which will have fo
a distinct stratum at the bottom of the b
has been carefully and completely separ
Attach a condenser to the apparatus, and
it to remain without any external applic
of heat for twenty-four hours; then app
a gentle heat, let the spirit distil until
which has passed over shall measure 1½
ounce; reject this, and continue the distill
into a fresh receiver until nothing more p
at a temperature of 200° Fahr.

II. Of *Hydrated* or *Commercial Alcoh*

a. (ALCOHOL, Ph. L. 1836.) Take of
fied spirit (sp. gr. 0·838), 1 gal.; *chlori*
calcium, 1 lb.; proceed as above, and
7 pints and 5 fl. oz. Sp. gr. of product C
It contains about 7% of water, by *weight*
5% by *volume*.

b. (ALCOHOL, Ph. D. 1826.) *Rectified s*
1 gal.; *pearl-ashes* (dried and still hot), 3
mix, digest in a covered vessel, with fre
agitation, for seven days; then decant
clear portion, and add to it of *chloride o*
cium, 1 lb.; agitate to effect solution,

acts as a violent nervous stimulant, and, by abstracting water from the soft tissues of the stomach and primæ viæ, destroys their organisation. It is alike poisonous to *all* animals;—2 drs. will kill a dog. *All strong spirits* act in the same way, the effect being proportionate to the state of concentration and the quantity taken. On *plants*, it acts as a rapid and fatal poison.

Ant., &c. Copious internal use of tepid water, with cold affusions to the head and spine, and injection of cold water into the ears. In the absence of vomiting, a strong emetic should be given, or the stomach-pump used. *Ammonia* may be used as a stimulant, and, added to water just in sufficient quantity to flavour it, is one of the best antidotes. The head should be kept elevated, and bleeding had recourse to, if cerebral congestion threatens.

Tests in case of death. 1. The *odour* of the contents of the stomach and ejected matters, and their ready inflammability. 2. The spirit may be separated by digestion with water, filtration, the addition of carbonate of potash, and distillation.

Comp., &c. Its per-centage composition is—

	Dumas and Boullay.	Brande and Ure.	Ure, sp. gr. 0·812.
Carbon . .	52·37	52·18	47·85
Hydrogen .	13·01	13·04	12·24
Oxygen . .	34·61	34·78	39·91
	99·99	100·00	100·00

This nearly represents 2 equivalents of carbon, 3 eq. of hydrogen, and 1 of oxygen. The atom of alcohol is now regarded as a multiple of these numbers, and formed by the breaking up of one atom of *grape sugar* ($C_{12}H_{28}O_{14}$) into 4 eq. of alcohol, 8 eq. of carbonic acid, and 4 eq. of water. It was formerly regarded as a compound of 1 eq. of olefiant gas, and 1 eq. of water; but it is now generally viewed as HYDRATE OF THE OXIDE OF ETHYLE ($C_2H_5 . HO$), or a compound of ethylene and water ($C_2H_4 . H_2O$). Grape sugar alone yields alcohol; cane sugar, before it undergoes the vinous fermentation, being first converted into this substance by contact with the ferment.

Purity. The presence of water is shown by the specific gravity (see ALCOHOLOMETRY); the absence of other foreign matter by the following tests:—

1. Its *colour* and *transparency* is not affected by the addition of a little colourless oil of vitriol (Liebig), or by a solution of nitrate of silver, and subsequent exposure for some time to solar light (Vögel), unless either essential oil or organic matter be present, when it assumes a *reddish tinge*. 2. It should be *neutral* to test-papers, colourless, leave no residue on evaporation, and be miscible, in all proportions, with water and with ether. 3. Its boiling-point should never be less than 170° Fahr.; a lower temperature suggests the pres
wood spirits, or acetone, or one of the
To detect wood spirit (wood naphth
Nesler's Test. For the reverse of thi
teration—the evasion of the duty by t
troduction of spirit, under the disg
naphtha, turpentine, &c.—see those a
4. The presence of water in alcohol r
detected, not only by the sp. gr., but
white anhydrous sulphate of copper b
blue when dropped into it. 5. Pot
placed on alcohol *does not take fire,*
a considerable per-centage of water
sent.

Tests, &c. 1. It may generally be
nised by its volatility, inflammability,
taste, miscibility with water, power of
ing camphor and resins, and other q
already described. 2. If a few fibres
bestos be 'moistened' with a saturate
tion of bichromate of potash in oil of
and exposed to the smallest possible
of hot alcohol-vapour, it is almost in
turned *green,* owing to the formation o
of chromium. *In practice,* the asbest
be inserted in the neck of a retort, or
a bulbed glass-tube containing a few
the suspected solution, when the effect
as soon as distillation commences. Et
pyroxylic spirit produce a nearly sim
sult; but the 'first' of these is distin
from alcohol by its *not* being miscib
water in *all* proportions; and the 'ot
Nesler's Test; whilst both may be rea
tinguished by their peculiar and chara
odour. 3. Dissolve 3 pts. crystallised ca
of soda in 10 pts. water. To this solut
1 pt. of liquid to be tested, and heat t
160° Fahr. Lastly, add iodine in small
till it has entirely dissolved, and the liq
become colourless. If alcohol be
iodoform will make its appearance on
and sink to the bottom in the form of
low powder. As a similar result is o
with *wood spirit,* this must be prove
absent before applying this test.

The only reliable method of proving
sample is ethylic alcohol is the produ
ether, by acting on the suspected liqu
sulphuric acid. See ETHER.

Uses. In the *arts,* alcohol is used
varnish-maker, to dissolve resins; by t
fumer, to extract the odour of plants, a
solve essential oils, soaps, and other
substances; by the *pharmaceutist,* to
tinctures and other valuable medicin
the *instrument-maker,* to fill the bulbs
mometers required to measure extre
grees of cold; by the *photographer,*
preparation of collodion; by the *che*
analysis, and in the manufacture of nu
preparations; by the *anatomist* and
ist, as an antiseptic; and by the *physic*
various purposes and applications as a
It is also frequently *burnt in lamps,*
parts of the world where it is inexpe

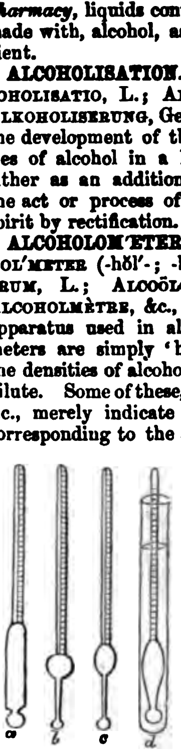
crystallisation of the salt in alcohol (Graham). They are all very unstable, being readily decomposed by water.

ALCOHOLIC. *Syn.* Alcoholicus, L.; Alcoholique, &c., Fr.; Alkoholisch, Ger. Pertaining to, containing, of the nature of, or made with, alcohol.

ALCOHOLICA. [L.] *Syn.* Alcooliques, Fr.; Weingeist-verbindungen, Ger. In *pharmacy*, liquids containing, or preparations made with, alcohol, as a characteristic ingredient.

ALCOHOLISATION. [Eng., Fr.] *Syn.* Alcoholisatio, L.; Alcoölisation, &c., Fr.; Alkoholiserung, Ger. In *chem.* and *pharm.*, the development of the characteristic properties of alcohol in a liquid, or the use of it either as an addition or a menstruum; also the act or process of obtaining alcohol from spirit by rectification.

ALCOHOLOMETER (-lŏm′-). *Syn.* Alcohol′meter (-hŏl′-; -hŏm′-‡); Alcoholome′trum, L.; Alcoölomètre, Alcoomètre, Alcoholmètre, &c., Fr. An instrument or apparatus used in alcoholometry. Alcoholometers are simply 'hydrometers' adapted to the densities of alcohol, either concentrated or dilute. Some of these, as Baumé's, Cartier's, &c., merely indicate the number of degrees corresponding to the state of concentration of the liquid. Others, of a like construction, as those of Richter (*a*), Tralles (*b*), and Gay-Lussac (*c*), have their stems so graduated as at once to indicate the *proportion per cent.* of alcohol present, either by weight, or by volume, at some standard temperature. (See *engr.*) A third class, as those of the Abbé Brossard-Vidal, Field, &c. are essentially thermometers, with scales which indicate the boiling-points of spirits of different strengths, instead of the common thermometric degrees; whilst to a fourth class belong the alcoholometer of M. Silbermann, which is based upon the known *rate of expansion* of alcoholic liquors *by heat*, expressed in alcoholometric degrees; and that of M. Geissler, which depends on the measurement of the tension of the vapour of the liquid, as indicated by the height to which it raises a small column of mercury. In Sykes' hydrometer, used by officers of the Revenue, the scale of the instrument is enormously extended by the use of movable weights, with each of which it becomes, in fact, a separate instrument, adapted to a certain range of specific gravities.



A very convenient alcoholometer for ordinary purposes (*d*) has been lately produced by some of the instrument makers. It is of the usual form, but its stem on one side exhibits the per-centage richness of the samj
alcohol by volume; and on the othe
per-centage by weight. Thus, both resul
be obtained at one trial. This instrum
sometimes called Richter's alcoholoı
in England. A further *improvement*
more recently introduced, is a similar 'd
scale' instrument, showing the degr
Sykes on one side, and carrying a
spirit-thermometer in the bulb, to
a scale is fixed ranging from 35° t
Fahr.

ALCOHOLOMETRY. *Syn.* Alcohol′i
(-hŏl′-; -hŏm′-‡); Spirit testing‡;
holme′tria, L.; Alcoölométrie, Alc
trie, &c., Fr. In *chemistry*, the art o
cess of ascertaining the richness of spi
alcohol. In *commerce*, the determinat
the quantity of spirit of a certain str
taken as a standard, present in any
sample of spirituous or fermented l
In England, this standard is called '
spirit."

Hist., *&c.* The great importance of
able *accurately* to determine the stren
spirits in the United Kingdom, on accc
the high duties levied on them, has iı
the Government authorities, at various
to investigate the subject. In 1790, th
ter was referred to Sir C. Blagden,
Secretary to the Royal Society, who
tuted an extensive series of experime
determine the *real specific gravities* of
ent mixtures of alcohol and water. T
sults of his labours and researches we
forward, with 'Gilpin's Tables,' in 17
no practical measures appear to hav
taken in consequence. In 1832 a com
of the Royal Society, at the request
Lords of the Treasury, examined into t
curacy of the *Tables*, and the constı
and application of the instrument (S
hydrometer) now used by the Revenı
cers, on which they reported favorabl
declared that they were sufficiently
for all practical and scientific purposes.
errors introduced into calculations c
strength of spirits by these *Tables*
found to be quite unimportant in practi
did not, in any one instance, amount t
in the fourth place of decimals. This n
adopts the *specific gravity* as the test
strength of spirits, and is founded c
fact that alcohol is considerably light
water, and that (with proper correcti
condensation and temperature) the
regularly increases, or decreases, accord
the relative proportions in which the t
mixed.

Several other methods of *alcoholomet*
been proposed, founded upon—the var
in temperature of the vapour of alc
different strengths—the heat evolved
admixture with water—its dilatation b
—the tension of its vapour—the insol
of carbonate of potash in alcohol—its

sample may be found, either by WEIGHT or VOLUME.

The specific gravities in this table are such as, on being referred to Gilpin's Tables, will give the expressions of proof strength, answering to whole indications of the Revenue hydrometer. Intermediate values at fifths of indications may be had by taking proportional differences between the nearest tabular numbers. Thus, to find the specific gravity that should stand opposite to Indication 70·6, we first obtain the difference between the densities standing in a line with Indications 70 and 71 respectively, and then say, as 1 : 0·6 : : ·00192 : ·00115, and ·94135 + ·00115 = ·94250, the specific gravity required.

b. With GLASS ALCOHOLOMETERS. That of Tralles, and most others of a like description, (as made in England), gave the *per-centage* strength, by VOLUME, with tolerable accuracy, at the standard temperature of 60° Fahr. Gay-Lussac's ALCOÖMÈTRE, which closely resembles that of Tralles, is adjusted for the temperature of 59° Fahr. (15° Cent.). All of these, to give at once accurate results, must, of course, be employed at the 'normal temperature' of the instrument. As, however, in practice, the experiment cannot be conveniently performed at any 'fixed' temperature, but only at that of the atmosphere, it is obvious that certain corrections are constantly required in order to obtain results of any value. Perfect accuracy requires that *Tables* for every variation of the thermometer, founded on actual experiments, should accompany each instrument; as, without them, tedious and difficult calculations are necessary, which, in the hurry of the cellar and laboratory, or by persons inexpert at figures, are not easily performed. A series of such *Tables* were prepared by Gay-Lussac, and, with his instrument, are those which are almost exclusively used in France. For rough purposes, in the absence of *Tables*, or nicer calculations, it may be useful to know, that, for *commercial spirits*, at ordinary temperatures, a variation of—

By VOLUME,

5° Fahr. is equal to (about) 1·00% of Alcohol; or (about) 1·794% of Proof spirit.
1° " " " 0·20% " " 0·359% "
5° Cent. " " 1·80% " " 3·229% "
1° " " " 0·36% " " 0·646% "

By WEIGHT,

5° Fahr. is equal to (about) 0·80% of Alcohol; or (about) 1·62% of Proof spirit.
1° " " " ·16% " " ·32% "
5° Cent. " " 1·43% " " ·29% "
1° " " " ·28% " " ·58% "

Thus, by making the proper ADDITION to the *apparent strength* per cent., when the *observed temperature* is BELOW the *normal temperature* of the instrument, or a corresponding SUBTRACTION, when it is ABOVE it, the *strength* of the sample may be determined sufficiently near for all practical purposes.

The following Table, taken from Loftus's 'Inland Revenue Officer's Manual,' will be found of great value in making these corrections, and has the merit of being easily applied.

An example will show how this Table is to be used.

Example.—If a quantity of spirit is of the sp. gr. 894 at 73°, what will be its sp. gr. at 60°?

Here the sp. gr. being between 890 and 900, we must add ·450 for each degree of temperature between 73° and 60°. The sp. gr. at 60° would, therefore, be 894 + (·450 × 13) = 899·85. *When the temperature is below 60°, the correction for each degree must be subtracted.* When, however, *very* accurate results are desired, and the necessary *Tables* are *not* accessible, the sample for trial must be brought to the normal temperature of the

TABLE II.—*Table for finding the Specific Gravity of any Spirit at 60° Fahr.; when the Specific Gravity at any other Temperature is given.*

Water taken as 1000.

Specific gravity.	Correction for each degree.	Specific gravity.	Correction for each degree.
810 to 820	± ·475	910 to 920	± ·434
820 to 830	± ·473	920 to 930	± ·424
830 to 840	± ·472	930 to 940	± ·406
840 to 850	± ·471	940 to 950	± ·381
850 to 860	± ·471	950 to 960	± ·340
860 to 870	± ·466	960 to 970	± ·269
870 to 880	± ·460	970 to 980	± ·165
880 to 890	± ·456	980 to 990	± ·090
890 to 900	± ·450	990 to 1000	± ·084
900 to 910	± ·442		

instrument, in the manner explained under HYDROMETRY.

c. From the SPECIFIC GRAVITY. The temperature having been taken by a thermometer, and the specific gravity ascertained by any of the usual methods, but preferably by means of an accurate *glass* hydrometer, it merely becomes necessary to refer to Table I, where, against the number expressing the specific gravity, the alcoholic content *per cent.*, by VOLUME, of the sample examined, will be found for 60° Fahr., subject to the corrections just referred to, when the temperature is either above or below this point.

If the *precise specific gravity* sought cannot be found in the *Table*, the *difference* between it and the next *greater* specific gravity must be taken for the numerator of a fraction, having for its denominator the difference between the greater and the next less specific gravity in the table. This fraction, added to the per-centage of alcohol in the fourth column of the table, opposite the greater sp. gr., will give the true per-centage sought. Thus, the sp. gr. ·96051 is not in the table, and the next greater number is ·96068; the former must, therefore, be deducted from the latter, and the difference (17) put as the *numerator* of the fraction, having for its *denominator* 191, the difference between ·96068 and ·95877. The fraction $(\frac{17}{191})$ ·089, so found, added to the per-centage strength opposite ·96068 in the third column, gives 33·989 as the true per-centage of alcohol in the given sample.

The per-centage by *volume* may be converted into per-centage by *weight*, by multiplying the former by ·793811, the sp. gr. of absolute alcohol, and dividing the product by the sp. gr. of the sample. The quotient is the number of pounds of alcohol in 100 pounds of the given spirit. Thus:—Suppose 1000 grains by measure of alcohol to weigh 950·92 grains, and to contain (see Table I) 40·63 per cent. by volume of absolute alcohol, what per cent. by weight does the sample contain?

·793811 × 40·63 = 32·25254093, and this product divided by ·95092 = 33·917, the true per-centage by weight of absolute alcohol in the sample.

2. Method based on the *specific gravity*, or *per-centage strength* by WEIGHT:—

The specific gravity is ascertained and the Table used in precisely the same manner as in the "method by volume," already described.

The per-centage by *weight* may be converted into per-centage by *volume*, by multiplying the former by the sp. gr. of the sample, and dividing the product by the sp. gr. of absolute alcohol. This is merely the reverse of the operation described above.

Obs. The preceding methods of *alcoholometry*, as well as all others depending on the *sp. gr.*, refer to UNSWEETENED SPIRITS only; and are inapplicable to those holding sugar in solution, or any other organic matter capable of altering the sp. gr. For *sweetened spirits*, *fermented worts*, *wine*, *beer*, &c., one or other of the following processes must be adopted:—

3. Other methods, adapted to either SWEETENED or UNSWEETENED *Spirits*, *Tinctures*, *Fermented Liquors*, &c.—

a. By DISTILLATION, as originally proposed by M. Gay-Lussac. 300 parts of the *liquor* under examination (measured in a graduated glass tube) are placed in a retort or small still, and a quantity *exactly* equal to *one third* (*i.e.*, 100 parts), carefully drawn over; a graduated glass tube[1] being used as a receiver, and the operation stopped as soon as the distillate reaches the hundredth degree. The 'alcoholic strength' of the *distilled liquor* is then ascertained by any of the usual methods, and the result divided by three, when the *per-centage* of alcohol in the original liquor is at once obtained. If, from want of attention, more than 100 parts should be distilled over, the *number* which *expresses* the *relation of the volume of the distilled product* to the *original bulk of the liquor tested*, must be employed as the *divisor*. Thus, if 106 parts of *liquor* have distilled over (instead of 100), containing 33% of alcohol, the 300 must be *divided* by 106, which gives 2·83, and the 33% by this 2·83, which gives 11·66%, the *true proportion* of *alcohol* in the original liquor. The strength at 'proof' may be calculated from this in the usual way.

To ensure accurate results, the acidity (if any) of the liquor must be neutralised with *carbonate of sodium*, prior to distillation. It is also advisable to add 8% or 10% of common salt to the liquor in the retort or still; this, by raising the boiling-point, causes the whole of the spirit to pass over into the receiver before the distillate has reached the required measure. This applies more particularly to weak liquors. With those of greater strength (as the stronger wines), it is better to distil over 150 parts, and divide the result by 2 instead of 3. To liquors stronger than 25% by volume of alcohol, or above 52% to 54% under proof, add about an equal volume of water to the liquor in the still and draw over a quantity equal to that of the sample tested; when the alcoholic strength of the distillate gives, without calculation, the *true strength* sought. To liquors stronger than 48% to 50% (14 to 12 u. p.), add thrice their *bulk* of *water*, and do not stop the process until the volume of the distillate is double that of the sample tested, when the *per-centage* obtained must also be doubled. In each case a proportionate quantity of salt is employed.

REVENUE METHOD. The following is the method adopted in the Inland Revenue and Customs Laboratories for the estimation of the per-centage of alcohol in wines, liqueurs, &c.

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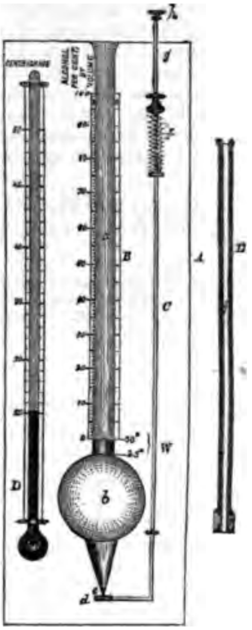
[1] Mulder, in his "*Chemistry of Wine*," recommends this receiver to be shaped like a bottle, with its neck, or tubular part, bent at right angles *above* the line of its scale; and that it should be set in the centre of a glass jar kept filled with *very cold* water.

TABLE V.—*Showing the* BOILING-POINTS *of 'under proof' spirit.* By Dr. URE.

Boiling-points. Fahr.	Per-centage strength.	Corresponding Sp. Gr.
178·5	Proof	·9200
179·75	10· U.P.	·9321
180·4	20· "	·9420
182·1	30· "	·9516
183·4	40· "	·9600
185·6	50· "	·9665
189·	60· "	·9729
191·8	70· "	·9786
196·4	80· "	·9850
202·	90· "	·9920

Obs. This method does not answer well with spirituous liquors *above* 'proof,' owing to the variations of their boiling-point being so slight as not to be easily observed with accuracy; but with liquors *under* 'proof,' and particularly with *wines*, *beer*, and other *fermented liquors*, due care being observed, it gives results closely approximating to those obtained by distillation, and sufficiently accurate for all ordinary purposes. In testing *strong* alcoholic solutions it is, therefore, proper to dilute them with twice their bulk of water; and *commercial spirits*, with an *equal* bulk of water; the results obtained being *doubled* or *tripled* as the case may be.

d. From the EXPANSION of the LIQUID when heated:—Silbermann's DILATATOMETER. The expansion of alcohol between 0° and 212° Fahr. is *triple* that of water; and between 77° and 122° Fahr., it is much greater. Between —14° and —98° Fahr., the rate of expansion is about the ·00047th part in volume for every degree of Fahrenheit's scale. The measurement of this expansion has been proposed as a new and ready method of alcoholometry, adapted to nearly all spirituous and fermented liquors. Silbermann's instrument, which is based on it (see *engr.*), simply consists of a flat brass or ivory plate (*A*), on which are fixed a mercurial thermometer (*D*) graduated from 22° to 50° Cent. (=77° to 122° Fahr.); and the DILATATOMETER (*B*), which is a glass pipette open at both ends. A valve of cork, or vulcanised Indian rubber, closes the tapering end (*c*); this valve is attached to a movable rod (*C*) which is fastened to the supporting-plate, and connected with a spring (*f*) and a handle (*g*) bearing a four-threaded screw, by which the lower orifice of the pipette can be opened or closed at will. In use, the pipette is filled with the liquor under examination, to a little *above* the *zero* point (0) on the scale. This is effected by suction, by means of a little piston of leather (*i*), which fits tightly in the long and wider limb of the pipette; the valve (*d*) being previously opened by turning the knob (*h*). proper quantity of liquor being introduced the *lower* end closed, the piston is move



and down two or three times, for the pu of drawing the air-bubbles and absorb out of the liquid, the presence of which vitiate the results of the trial. To allo piston to be withdrawn without any sho the danger of dividing the column abr the rod attached to it is made hollow thr out. In using it, the operator applies the his forefinger to the *top* of the piston-rod (order to create a vacuum as he *raises* it then withdraws it, to readmit the air wh *thrusts it down* or *removes* it from the The excess of liquid (if any) in the pip then run off until its *upper* surface is e level with the *zero* (0) of the scale, at to which it is raised by immersion in a *bath* of that temperature, as observed thermometer; which is done by very *cau* turning the rod which depresses the The whole apparatus is now again imme the *water bath*; and, held by the upper p of the plate, kept in gentle motion wi hand, until the temperature rises to 50° C., when the coefficient of expan obtained, and hence also the *propor alcohol*—the *scale* of the *instrument* be graduated, from actual experiments pre made upon mixtures of known comp as to give, at once, the *per-centage* of *alc* VOLUME (nearly).[1]

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[1] "*Comptes Rendus*," xvii, 418.

By Weight.	By Volume.		Sp. gr. at 60° F
	Bulk *before* admixture.	Bulk *after* admixture and condensation.	
Alcohol. Water.	Alcohol. Water.		
100·00 + 103·08	100·00 + 81·80	175·23	·91984
49·24 + 50·76	57·06 + 46·68	100·00	

The ***standard alcohol*** of the Revenue authorities, and that on which Gilpin's *Tables* are founded, is a spirit of the sp. gr. ·825 at 60° Fahr., which is said to contain, by *weight*, 89% of *pure alcohol* of ·796; and 92·6% of alcohol, by *volume*, which corresponds to about 62·5 o. p.

It is of great importance to the spirit-dealer to be able to estimate correctly the *number* of 'proof gallons' in any quantity of his commodities, or in the whole or any portion of his stock, as disagreeable errors frequently result from ignorance on this point. Calculations of this kind are extremely simple. Thus, when we find, by the hydrometer, that a given sample of spirit is 10% *over-proof*, it means, that 100 gallons of such spirit contain as much alcohol as 110 gallons of proof spirit. In *over-proof* spirit, the per-centage o. p. always represents the *quantity of water* which the given spirit requires to reduce it to proof. By *adding* this *per-centage* over-proof to 100, we obtain a *number*, which multiplied by any number of gallons, and divided by 100, gives the exact number of proof-gallons which is contained in any quantity of the spirit referred to. Thus:—*A puncheon of rum* gauged at 91 *galls.*, and *shown by the hydrometer to be* 21 o. p., contains—

21 o. p. of sample added to 100 . .	121
No. of gallons of rum	91
100)	11011
No. of gal. of *proof-spirit* . . .	110·11

In like manner when a spirit is said to be 11 *u. p.*, or *under-proof*, it means that 100 gal. of such spirit contains 11 gal. of *water*, and 89 gal. of 'proof spirit.' By *deducting* the *per-centage* under-proof from 100, we not only obtain the number of proof gal. contained in 100 gal. of such spirit, but, as in the last case, a *factor* which *multiplied* by any number of gal., and divided by 100, gives the exact number of 'proof gallons' contained in any quantity of the given strength. Thus:—An *ullage brandy-piece containing* 45 *gal. of spirit at* 10 *u. p.*, would have the *proof value* of—

Per cent. *u. p.* of sample 10, subtracted from 100 . . .	90
No. of gall.	45
100)	4050
Quantity of *proof spirit* . . .	40·50

Or exactly 40½ gallons.

The *strength* of *absolute alcohol* (s ·7938) is estimated at 75¼ % *over-proo* therefore contains 175¼ % of 'proof s whilst *proof spirit* (sp. gr. ·91984) co 57·06% of 'absolute alcohol;' both bei measure or volume. Thus—

$$\frac{\text{meas. of } alc. \times 175\tfrac{1}{4}}{100} = \left\{ \begin{array}{l} \text{equiv. m} \\ \text{of } pf. \text{ s} \end{array} \right.$$

And—

$$\frac{\text{meas. of } pf.\ spt. \times 57\cdot06}{100} = \left\{ \begin{array}{l} \text{equiv. m} \\ \text{of } abs. \end{array} \right.$$

From which we derive the 'constant m pliers' 1·7525 (or roughly 1¾), and ·570 plicable to any number of volumes or ga For—

$$\text{meas. of } alc. \times 1\cdot7525 = \left\{ \begin{array}{l} \text{equiv. m} \\ \text{of } pf. \text{ s} \end{array} \right.$$

and—

$$\text{meas. of } pf.\ spt. \times \cdot5706 = \left\{ \begin{array}{l} \text{equiv. m} \\ \text{of } alc \end{array} \right.$$

To ascertain *what quantity* of a *spirit* a given strength is *equiv.* to or contains 10 of *absolute alcohol*, we have only to *divi* constant number 2207·7 by the *proof-* per cent. of such spirit.[1] Thus—for a 12 *u. p.*—this would be

$$100 - 12 = 88\% \text{ of } proof\ spirit;$$

and—

$$\frac{2207\cdot7}{88} = 25\cdot1 \text{ gal. (nearly).}$$

That is, 25$\frac{1}{10}$ gal. of such spirit would co 100 *lbs.* of *absolute alcohol.*

By removing the decimal point *one* pl the RIGHT, we have the *equiv. meas* 1000 *lbs.* By removing it *one*, *two*, or places to the LEFT, we have it respective 10 *lbs.*, 1 *lb.*, and $\frac{1}{10}$ *lb.*; from which the for all other weights may be easily obtai

By *reversing* the above operation, the *sure* of *alcohol* corresponding to *any weight* of *spirit*, at any strength, may al easily found.

The WEIGHT of 1 gal. of *absolute al* being 7·938 *lbs.*; that of 1 gal. of *proof s* 9·2 *lbs.*; and that of the 'alcohol' in 1 of *proof spirit*, 4·58 *lbs.*; the weight o number of gallons or volumes of e

---

[1] This number is obtained thus:—

$$\frac{100}{\cdot79381} = 12\cdot6 \text{ (nearly),}$$

and—

$$12\cdot6 \times 175\cdot25 = 2207\cdot7.$$

	Cwts.	qrs.	lbs.
Gross weight of full cask =	13	2	27
Tare . . . . =	2	2	5
Net weight of spirit =	11	0	22

or 1254 lbs. Let us suppose the hydrom indication to be 43·0, the weight per imp gallon would be 8·903 lbs. (see Table VI), 1254 ÷ 8·903 = 140 gallons.

TABLE VI.—*Table for determining the Weight per Gallon of Spirits by Sykes' Hydrom*

Indication on Sykes' Hydrometer.	Weight per Gallon.	Indication on Sykes' Hydrometer.	Weight per Gallon.	Indication on Sykes' Hydrometer.	Weight per Gallon.	Indication on Sykes' Hydrometer.	Weight per Gallon.	Indication on Sykes' Hydrometer.	Weig per Gall
0	8·145	10		21	8·512	31		42	8·88
2	8·157	6	8·333	2	8·516	6	8·699	2	8·88
4	8·161	8	8·337	4	8·519	8	8·702	4	8·89
6	8·164	11	8·340	6	8·523	32	8·706	6	8·89
8	8·168	2	8·343	8	8·526	2	8·709	8	8·89
1	8·171	4	8·347	22	8·530	4	8·713	43	8·90
2	8·174	6	8·350	2	8·533	6	8·716	2	8·90
4	8·178	8	8·354	4	8·537	8	8·720	4	8·91
6	8·181	12	8·357	6	8·540	33	8·723	6	8·91
8	8·185	2	8·361	8	8·544	2	8·727	8	8·91
2	8·188	4	8·364	23	8·547	4	8·730	44	8·92
2	8·191	6	8·368	2	8·551	6	8·734	2	8·92
4	8·195	8	8·371	4	8·554	8	8·737	4	8·92
6	8·198	13	8·375	6	8·558	34	8·741	6	8·93
8	8·202	2	8·378	8	8·561	2	8·745	8	8·93
3	8·205	4	8·382	24	8·565	4	8·748	45	8·94
2	8·208	6	8·385	2	8·568	6	8·752	2	8·94
4	8·212	8	8·389	4	8·572	8	8·755	4	8·94
6	8·215	14	8·392	6	8·575	35	8·759	6	8·95
8	8·219	2	8·395	8	8·579	2	8·763	8	8·95
4	8·222	4	8·399	25	8·582	4	8·766	46	8·95
2	8·225	6	8·402	2	8·586	6	8·770	2	8·96
4	8·229	8	8·406	4	8·589	8	8·773	4	8·96
6	8·232	15	8·409	6	8·593	36	8·777	6	8·96
8	8·236	2	8·412	8	8·596	2	8·781	8	8·97
5	8·239	4	8·416	26	8·600	4	8·784	47	8·97
2	8·242	6	8·419	2	8·603	6	8·788	2	8·98
4	8·245	8	8·423	4	8·607	8	8·791	4	8·98
6	8·249	16	8·426	6	8·610	37	8·795	6	8·98
8	8·252	2	8·429	8	8·614	2	8·799	8	8·99
6	8·255	4	8·433	27	8·617	4	8·802	48	8·99
2	8·258	6	8·436	2	8·620	6	8·806	2	8·99
4	8·262	8	8·440	4	8·624	8	8·809	4	9·00
6	8·265	17	8·443	6	8·628	38	8·813	6	9·00
8	8·269	2	8·446	8	8·631	2	8·817	8	9·00
7	8·272	4	8·450	28	8·635	4	8·820	49	9·01
2	8·275	6	8·453	2	8·639	6	8·824	2	9·01
4	8·279	8	8·457	4	8·642	8	8·827	4	9·02
6	8·282	18	8·460	6	8·646	39	8·831	6	9·02
8	8·286	2	8·464	8	8·649	2	8·835	8	9·02
8	8·289	4	8·467	29	8·653	4	8·838	50	9·03
2	8·292	6	8·471	2	8·656	6	8·842	2	9·03
4	8·296	8	8·474	4	8·660	8	8·845	4	9·03
6	8·299	19	8·478	6	8·663	40	8·849	6	9·04
8	8·303	2	8·481	8	8·667	2	8·853	8	9·04
9	8·306	4	8·485	30	8·670	4	8·856	51	9·05
2	8·309	6	8·488	2	8·674	6	8·860	2	9·05
4	8·313	8	8·492	4	8·677	8	8·863	4	9·05
6	8·316	20	8·495	6	8·681	41	8·867	6	9·06
8	8·320	2	8·498	8	8·684	2	8·871	8	9·06
10	8·323	4	8·502	31	8·688	4	8·874	52	9·06
2	8·326	6	8·505	2	8·692	6	8·878	2	9·07
4	8·330	8	8·509	4	8·695	8	8·881	4	9·07

Methyl-alcohol (*wood-spirit*) .	$C \; H_4 \; O$
Ethyl-alcohol (*ordinary alcohol*)	$C_2 \; H_6 \; O$
Amyl-alcohol (*füsel-oil*) . .	$C_5 \; H_{12} \; O$
Capryl-alcohol	$C_8 \; H_{18} \; O$
Cetyl-alcohol	$C_{16} \; H_{34} \; O$
&c. &c.	

Alcohols. In *commerce*, pure spirits of a greater strength than about 58 *o. p.* (sp. gr. ·8335), or containing more than about 85% by WEIGHT, or 90% by VOLUME, of pure alcohol, are commonly so called.

Alcohols. In *perfumery*, rectified spirit of wine, or commercial alcohol, holding essential oils or other odorous matters in solution.

Alcohols. In *Fr. pharmacy*, alcoholic tinctures and essences.

ALCOOLATIFS (alcoölatifs). [Fr.] *Syn.* ALCOHOLATI′VA, L. In *Fr. pharmacy*, alcoholic solutions of *liniments*, *embrocations*, &c., whether made by distillation, maceration, or solution.

ALCOOLATS (alcoölats). [Fr.] In *Fr. pharmacy*, esprits; applied by Béral, Henry and Guibourt, and others, to medicated distilled spirits.

ALCOOLATURES (alcoölatures). [Fr.] *Syn.* ALCOHOLATU″RA, L. In *Fr. pharmacy*, alcoholic tinctures, elixirs, &c. M. Béral confines the term to vegetable juices preserved by alcohol.

ALCOOLES (alcoölés). [Fr.] Tinctures; the '*teintures alcoholiques*' of the Fr. Codex.

ALCOOLIQUES (alcoöliques). [Fr.] *Syn.* ALCOHOL′ICA, L. In *Fr. pharmacy*, alcoholic or spirituous solutions. (Béral.)

AL′CORNINE (-nĭn). [Eng., Fr.] *Syn.* ALCOR′NOCINE (-sĭn); ALCOR′NEUM, ALCORNI′NA, L. A crystallisable substance, apparently intermediate between fat and wax, discovered by Biltz, in *alcornoco bark*.

ALCORNO′CO. *Syn.* A.-BARK; ALCORNOQUE, Fr.; ALKORNOC, A.-RIND, Ger. The bark of an unknown tree of South America. It is astringent and bitter, and has been highly extolled as a specific in *phthisis*; but appears to possess little medicinal virtue. The bark of the young branches of the *cork-tree* (*quercus suber*), used in tanning, is also sometimes called alcornoco-bark; but possesses none of the characters of the former article.

AL′DECAY. The *galls* on the leaves of *myrobalanus chebula* (Gaertn.), a forest-tree of Bengal. Equal to the best oak-galls.

AL′DEHYD (-hīd). [*al*-(cohol)-*dehyd* (rogenatus).] C_2H_4O. *Syn.* HYDRATED OXIDE OF ACETYLE; HYDRATE OF OTHYLE*; HYDROXIDE OF O.* *Literally*, dehydrogenated alcohol. In *chemistry*, a peculiar ethereal liquid, first obtained in a pure form by Liebig, from alcohol. It is produced under various circumstances, particularly during the destructive distillation of certain organic matters, and in several processes of oxidation. The following are the most convenient methods of preparing it:—

Prep. 1. (Liebig.) *Sulphuric acid*, 3 parts; is diluted with *water*, 2 parts; and as soon as the mixture has cooled, *alcohol* of 80%, 2 parts, is *added*; and, subsequently, *peroxide of manganese (in fine powder), 3 parts*, The whole,
after agitation, is then distilled at a v
heat, from a spacious retort into
surrounded with ice, the connection
the two being perfectly air-tight.
cess is continued until frothing com
the distillate becomes acid; which
occurs when about one third (3
passed over. The distillate is nex
in a retort, with about its own weig
chloride of calcium, in powder; af
about one half only is drawn over
gentle heat (85° to 90° Fahr.), by m
water bath. This rectification is re
a precisely similar way. The last d
ANHYDROUS ALDEHYD only slightly
nated with foreign matters.

2. (Liebig.) *Aldehyd-ammonia*,
dissolved in an equal weight of *distil*
and, after being placed in a retort,
acid, 2 or 3 parts, previously dil
rather more than its own weight
water, and allowed to cool, is ad
whole is now distilled, by means o
bath, into a receiver surrounded w
(preferably) a freezing-mixture, the
ture of the bath at first being ver
the operation being stopped as soon,
before the water begins to boil. Th
is then placed in a retort connect
well-cooled receiver, as before; an
the joints are made perfectly tight,
fused chloride of calcium, in weigh
that of the liquid in the retort
through the tubulature. The heat p
the hydration of the chloride causes
lation to commence, after which it
on, by means of a water bath, at a te
ranging from 80° to 82° Fahr. Thi
tion being very carefully repeate
distillate is PURE ANHYDROUS ALDE

Prop., *&c.* Limpid, colourless,
neutral, inflammable; mixes in all
with alcohol, ether, and water; o
liar, penetrating, and, when stron
ingly suffocating, the vapour, in
producing spasmodic contraction o
rax; boils at 72° Fahr. (70°—Ure,
sp. gr. ·790 at 60°, and ·800 at 32°
gr. of vapour, 1·532; by exposure
gradually converted into acetic
speedily so under the influence of
black; heated with caustic potash
substance resembling resin (ALDEH
is formed; gently heated with pr
silver, or its solutions, *metallic silv*
sited on the inner surface of the
uniform and brilliant film, whilst AL
OF SILVER remains in solution; he
hydrocyanic acid it yields ALANINE.
even in close vessels, it passes into o
isomeric compounds (ELALDEHYDE
DEHYDE), with change of properti
hyde for experiments should, the
always recently prepared; and it mu
in a well-stopped bottle, in a very
and preferably, in ice.

with about 3 handfuls of *hops*, and 12 to 14 *lbs.* of *crushed groats*, until the whole of the soluble matter of the latter is extracted. The resulting liquor, after being run through a coarse strainer, and become lukewarm, is fermented with 2 or 3 pints of *yeast*; and, as soon as the fermentation is at its height, is either closely bunged up for 'draught,' or is at once put into strong stoneware bottles, which are then well-corked and wired.

Obs. White ale is said to be very feeding, though apt to prove laxative to those unaccustomed to its use. It is drunk in a state of effervescence or lively fermentation; the glass or cup containing it being kept in constant motion, when removed from the mouth, until the whole is consumed, in order that the thicker portion may not subside to the bottom.

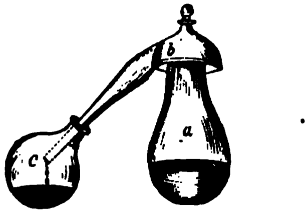
Med'icated Ales. *Syn.* BRYT'OLES; BRUTOLÉS, Fr.; CEREVIS'IÆ MEDICA'TÆ, L. In *pharmacy*, ale prepared by macerating medicinal substances in it, either at the ordinary temperature of the atmosphere, or when heated; infusions and decoctions, in which ale or beer is employed as the menstruum. The old dispensatories enumerate several medicated ales; such as CEREVISIA OXYDOR'CICA, for the eyes; C. ANTI-ARTHRIT'ICA, for the gout; C. CEPHAL'ICA, for the head; C. EPILEP'TICA, against epilepsy; &c. Preparations of this kind are now seldom ordered by the faculty, and their use is chiefly confined to the practice of empirics, and to domestic medicine. *Bark*, *rue*, *savine*, *anti-scorbutic plants*, *aromatic bitters*, and *stomachics*, are the substances most commonly administered in this way. *Ale* in which *wormwood*, *gentian*, *orange-peel*, and the like, have been steeped, taken warm early in the morning, is much esteemed as a restorative tonic by drunkards and dyspeptics. See BEER, PURL, &c.

ALE'BERRY. A beverage made by boiling *ale* with *spice*, *sugar*, and *bread-sops*; the last, commonly toasted. A domestic remedy for a cold.

ALE'GILL (*g* hard). Ale or beer flavoured or medicated by infusing the *leaves* of *ground ivy* in it; pectoral, stomachic, and nervine.

ALE'WIFE. The *clupea serrata*, an American species of herring. Its proper name is *a'loof*, although the established pronunciation and common orthography is *ale-wife*.

ALEM'BIC. *Syn.* MOORS'HEAD†; ALEM'BICUS, L.; ALAMBIC, Fr.; DESTILLIRKOLBEN, Ger. An old form of distillatory vessel usually made of glass or earthenware, but sometimes of metal. The body (*a*) which holds the [illegible] for distillation, is called the CU'CURBIT; [illegible] upper part (*b*), the HEAD or CAP'ITOL; (c) [illegible] the RECEIVER. It is still employed in [illegible] laboratory, in the distillation of articles that [illegible] apt to spurt over into the neck of the [illegible] retort, and thus vitiate the product.



ALEUROM'ETER. *Syn.* ALEUROMÈTRE, [illegible] An instrument for determining the [illegible] and quality of *gluten* in wheat-flour, [illegible] by M. Boland. It essentially consists of [illegible] hollow copper cylinder, about 6 inches [illegible] and ¾ of an inch internal diameter. This [illegible] has two principal parts; the *one*, about 2 [illegible] long, is closed at the lower end, forming a [illegible] of *cup*, into which the gluten is placed, [illegible] screws into the remainder of the cylinder. [illegible] *cup* being charged with a *sample* of *gluten*, [illegible] the upper part of the cylinder being [illegible] on, it is exposed in an oven, or (preferably) [illegible] an oil bath, to a temperature of 350 to [illegible] Fahr.[1] From the length of the tube the [illegible] occupies in swelling, as measured by a [illegible] duated scale, its quality is determined. [illegible] 'crude gluten' of good wheat-flour [illegible] four or five times its original volume, [illegible] thus treated; but that from *bad* flour does [illegible] swell, becomes viscid and semi-fluid, and [illegible] nerally gives off a disagreeable odour; [illegible] that of good flour merely suggests the smell [illegible] hot and highly baked bread.

AL'GA. (-gă). [L.] Sea-weed. A common name of *grass-wrack* ('zostera marina'—Linn.), though not one of the algæ.

AL'GÆ. (ăl'-jē). [L. pl.] *Syn.* AL'GALS; ALGÆ (DC.), AL'GALES (Lindl.), L.; ALGUES, VARECH, Fr.; ALGE, MEERGRASS, SEEGRASS, Ger. Sea-weeds. In *botany*, an order of Thallogens living in water or very moist places, nourished throughout their whole surface by the medium in which they live, having no distinct axis of vegetation, and propagated by zoöspores, coloured spores, or tetraspores. Linnæus defines them—"plants, the *roots*, *leaves*, and *stems* of which are all in one." The *algæ* consist either of simple vesicles lying in mucus, or of articulated filaments, or of lobed fronds formed of uniform cellular tissue. Those that vegetate in *salt water* are popularly called SEA-WEEDS (*fu'ci*, L.) and LA'VER (*ulvæ*, L.) those found in *fresh water* CONFER'VÆ. One of their divisions (the *Zoöspermeæ*) comprehends the lowest known forms of vegetable life, being merely adhering cells, emitting, at maturity, seeds or sporules having a distinct animal motion. In *Oscillatorias*, the whole plant twists and writhes spontaneously; and *Zymenas* actually copulate like animals. Some of the Algæ possess great beauty. In the lower grades the colour is green; in the higher, red or purple.

Prop., *Uses*, *&c.* None of the Algæ ar

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[1] Mr. Mitchell recommends the heat to be 420°; while Prof. Muspratt gives 284° Fahr. as the proper temperature; but of these, the *first* is too high, and the *other* too low. About 210 gr. are also ordered to be taken for examination; but the exact quantity is immaterial. (See Mitchell's "Falsification of Food.")

. Several are nutritious, emollient, ulcent, from containing mucilage sin), starch, sugar (*mannite*), and a nmen; and are hence used as escu- The *ash* from the *dried weed* varies in varieties from 9% to fully 25%; and variable quantities of potassa, soda, gnesia, iron, manganese, and silica, huric acid, phosphoric acid, chlorine, le iodine and bromine. (Schweitzer; mer; Gödechens.) *Sea-weeds*, their and their *ashes*, have been long re- alterative and resolvent; and anti- irtues have been attributed to them ec and others. They were formerly en in scrofulous affections and glan- largements; but their use is now perseded by that of iodine and its ms. Dr. Stenhouse has proposed he algæ as furnishing an economical mannite. The *sea algæ* are used for their *ashes* form KELP.

O'BA. *Syn.* CA''ROB-TREE, ST. JOHN'S CERATO'NIA SIL'IQUA, Linn. A le- tree of southern Europe, Palestine, of Africa. *Pods* (ALGAROBA BEANS), ood, and to improve the voice; they sweetish, nutritious powder, and are to have been the 'locusts' on which St. in the wilderness; their decoction has as a pectoral in asthma and coughs.

ba or Algarovil'la. The *astringent* rosopis pallida, p. siliquastrum,* and *rtha* (South American trees), bruised or less agglutinated by the extractive of the seed and husks. They are *ansing*, for which purpose they have ngly recommended; indeed that of l of Santa Martha (New Carthagena), possess "four times the power of bark" (Ure); and in *dyeing*, are only o oak-galls.

ENT. [Eng., Fr.] *Syn.* ALIMEN'TUM, UNG, SPEISE, Ger. Food; nutriment; which nourishes or supports life.

NTARY. *Syn.* ALIMENTA''RIUS, L.; AIRE, Fr.,; ZUR NAHRUNG GEHÖRIG, rtaining to food or aliment; nutri- nourishing.

tary Canal'. *Syn.* ALIMENTARY DUCT; ALIMENTA''RIUS, L. In *anatomy*, the the bodies of animals into which the ken for the purpose of being digested; passage or conduit extending from h to the anus. In some of the lower this is a simple cavity, with only one when the same aperture which ad- food also gives egress to the excre- s matter. In others, it is a true th both a mouth and an outlet. An- p, and we find this canal is divided into h and intestines. In the higher grades, pharynx, and œsophagus *precede the Birds have one or two sacculi or ed to the œsophagus. The stomach ninants consists of four sacs or parts,* each of which may be regarded as a separate stomach; that of the bottle-nose whale contains no less than seven of such sacs. The part below the stomach, forming the intestines, is also variously subdivided, complicated, and connected. In man, these subdivisions are termed—DUODE'NUM, JEJU'NUM, IL'EUM, CÆ'CUM, CO'LON, and RECT'UM; the lower end or orifice of the last being called the A'NUS. The existence of an alimentary canal is said to be the only true characteristic of an animal. Plants have no common receptacle for their food, nor canal for carrying away effete matter; but every animal, however low in the scale of being, possesses an internal cavity which serves it as a stomach.

Alimentary Sub'stances. *Syn.* ALIMENTS; MATE''RIA ALIMENTA''RIA, L. Substances employed as food.

ALIMENTA'TION. [Eng., Fr.] *Syn.* ALIMENTA'TIO, L.; NAHRHAFTIGKEIT, Ger. The act, process, power, or state of nourishing, or being nourished.

AL'IZARI. [Tur., *ali-zari.*] The commercial name of *madder* in the Levant.

ALIZARIN. $C_{10}H_6O_3 . 2H_2O$. *Syn.* LAZARIC ACID. A red colouring matter obtained from madder.

Prep. 1. Exhaust madder with boiling water, and precipitate the decoction by sulphuric acid. Wash the precipitate, and, while yet moist, boil it with a concentrated solution of hydrate of aluminum in hydrochloric acid, and mix the solution with hydrochloric acid; red flakes of impure alizarin deposit. Dissolve this precipitate in alcohol or in dilute ammonia, and treat the solution with hydrate of aluminum. Boil the aluminum compound thus formed with carbonate of sodium, and, after freeing it from resinous impurities by digestion with ether, decompose it with hot hydrochloric acid. Wash the alizarin thus separated, dry it by simple exposure to air, and purify it by repeated crystallisation out of alcohol.

2. Sublime on a paper an alcoholic extract of madder. This method yields the purest alizarin.

Props. Red prisms; sublimes at 419° F.; odourless, tasteless, and neutral to test-paper; sparingly soluble in water, even at the boiling temperature; soluble in alcohol and ether; not decomposed by hydrochloric acid; dissolved, without decomposition, by strong sulphuric acid; soluble in solutions of the alkalies and their carbonates; acids precipitate alizarin from its alkaline solutions in orange-coloured flakes; alumina decolorises an alcoholic solution of alizarin, forming a red lake.

ALKALI. *Syn.* ALKALI, Fr.; LANGENSALZ, Ger. This word has been used in various senses, but is now usually applied to four substances only, viz. the hydrates of potassium, sodium, lithium, and ammonium (the latter being supposed to exist in the aqueous solu*tion of ammonia). In a more general sense, it is applied to the hydrates of barium, strontium, and calcium, which,* for the sake of distinction, are called the *alkaline earths*. The following properties are characteristic of the alkalies:—(1) They are soluble in water, the alkalies proper more so than the alkaline earths. (2) They change the hue of many vegetable colouring matters; thus, they turn reddened litmus blue, yellow turmeric brown, and syrup of violets and infusion of red cabbage green. (3) They neutralise the strongest acids. (4) They precipitate most of the heavy metals from solutions of their salts as hydrates or oxides. (5) They saponify the fixed oils and fats. (6) They exert a caustic or corrosive action on animal and vegetable substances.

ALKALIM'ETRY. *Syn.* ALKALIME'TRIA, L.; ALCALIMÉTRIE, Fr. In *chemistry*, the estimation of the strength of the commercial alkalies; the art or process of determining the quantity or proportion of pure caustic alkali, or of its carbonate, in any given sample or simple solution. It is the reverse of 'acidimetry;' and it should be understood that it does not apply to alkalies occurring under any other form or condition than those just mentioned. Alkalimetric assays are now also frequently and conveniently extended to the estimation of the alkaline earths and their carbonates, as hereafter noticed.

Alkalimetrical processes. These, like those of 'acidimetry,' are for the most part founded on—the capacity of the bases to saturate acids—the estimation of the quantity of dry carbonic acid liberated from a given weight of an alkaline carbonate under the influence of a stronger acid; and, in the case of the pure alkalies—the sp. gr. of their solutions. From any one of these results the exact amount of alkali, or of alkaline carbonate, present in a sample, is easily found or calculated. These processes are, indeed, precisely similar to those described under ACIDIMETRY; but here the unknown quantity sought is the *alkali*, instead of the *acid*.

Assay. The SAMPLE is drawn from as near the centre of the cask containing the alkali as possible, and at once placed in a wide-mouthed bottle, which is then closely corked up, and numbered. Before proceeding to the assay, the contents of the bottle are thrown on a piece of dry paper, the lumps crushed small, and the whole reduced to coarse powder as rapidly as possible. The number of grains required for the trial are then at once weighed, placed in a phial or *small* glass tube, and agitated with about ¼ *oz.* of hot water. After a short time allowed for repose, the clear liquid is poured off into a beaker-glass or other vessel in which the trial is to be made. This process is repeated with a *second* and a *third* quantity of water, or until nothing soluble remains, shown by the last washings not affecting the colour of turmeric paper. The greatest care must here be taken not to waste the smallest portion of the liquid, which would render the results inaccurate.

To the solution in the beaker-glass, a little solution of litmus is added, unless the acid is tinted with it, when it is unnecessary. T
solution is now heated until near its boili
point, and a piece of white paper or porcel
put behind it, to better show up the chang
of colour. The alkaline solution is now trea
with the standard test-acid, which is pour
carefully from an alkalimeter or Mohr's b
rette, until the solution, after turning a purp
red, suddenly assumes a pink colour. Ne
tralisation being thus effected, the operat
allows the sides of the alkalimeter or buret
to drain, and then either 'reads off' the nu
ber of divisions which have been consumed,
(if using the test-acid by weight) determin
the quantity by again weighing the alka
meter. The common practice is to allow t
drops (= ⅕th of an alkalimetrical division b
VOLUME, or 2 gr. by WEIGHT) for over-saturatio
which is, therefore, deducted from the 'observ
quantity' of the test-liquor employed.

In testing solutions of the PURE or CAUS
ALKALIES, the colour, on neutralisation, su
denly changes from blue to pink or r
without any intermediate vinous or purp
colour being produced.

The quantity of test-acid used gives t
absolute or per-centage composition of t
sample examined, according to the constituti
of the test-acid used.

Standard Acids. The various test-acids
use as described below, each being used b
different operators as they think best.

The most convenient *test-acid*, or norm
solution, both for commercial and chemic
assays, is perhaps dilute sulphuric acid, whic
when intended to be used VOLUMETRICALL
has the sp. gr. 1·032 at 60° Fahr., and co
tains in 100 alkalimetrical divisions 1000 wate
grains measure, or 1 litre, exactly 49 gr. (
grammes) of sulphuric acid; and when i
tended to be used GRAVIMETRICALLY, or b
weight, has the sp. gr. 1·033, and contains
1000 gr. (or grammes) weight exactly 49 g
(grammes) of sulphuric acid; and, in bo
cases, consequently corresponds to 1 equiv.
every other base. These dilute acids are easi
prepared by mixing 1 part of the concentrat
acid with 11 or 12 parts of distilled wate
the precise quantity depending on the streng
of the acid employed, and must be so a
ranged that 1000 grains shall exactly neutra
ise 1000 grains of water containing 53 grai
of pure anhydrous sodium carbonate.

This acid (as well as all those hereafter men
tioned) may be kept faintly tinged with litmu
which is often more convenient than tinging t
alkaline solution at the time of making the assa

It will at once be seen that every alka
meter division of the first of the above acid
and every 10 gr. of the second, represent t
$\frac{1}{100}$th part, or 1% of alkali whenever the equiv
lent weight[1] of the latter is taken for the assa
Every 1-10th part of an alkalimeter-divisio
(or every drop), and every grain weight (whe
a Schüster's alkalimeter is employed) the

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[1] See Table II, at the end of this article.

tively represents the $\frac{1}{10}$ of 1%; and the
sought is obtained without the necessity
calculation.

is obvious—for if the equivalent of a
lkali or of its carbonate (*i. e.* one of
requires an equiv. (100 alkalimeter-
ns, or 1000 gr.) of test-acid to saturate
lkali or alkaline carbonate of 75%, 50%,
, will respectively require only 75, 50, or
isions, or 750, 500, or 250 gr.; and so
er strengths in proportion. The only
tion necessary is always to take the
rd *weight* for the assay answering to
quiv. of the denomination of the *per-*
e result sought. Thus, in testing a car-
of potash, we may either wish to deter-
its per-centage richness in 'dry car-
,' or in 'pure potassa,' the latter being
y the case. To obtain the first, we must
9 gr. for the assay; and to obtain the
, 47 gr. With CAUSTIC ALKALIES, or
res containing them, the weight, in
, taken for the assay, must always cor-
d to the equiv. of the *pure base.* See
II, at the end of this article.

ommercial assays, when 100 gr. (or some
t part thereof) are taken for trial, the *per-*
e result is obtained from the number of
meter-divisions, or the number of grains,
test-acid consumed, by the common Rule
portion. Thus:—A crude sample of *pot-*
aving taken 90 alkalimeter-divisions of
cid to neutralise it, would contain—

100 : 47 :: 90 : 42·30

arly 42⅓ per cent. of *pure potassa.* If
0, 25, or 20 gr. are tested, the result
of course, be double, quadruple, &c., as
se may be. Or the third term of the
rtion may be multiplied by the denomi-
of the fraction representing the aliquot
This, in the case of 50 gr. (repeating
ove example), would be—

100 : 47 :: 45 × 2 : 42·30%

fore; but even these easy calculations
e simplified, as is shown below.

e of the advantages, and not the least,
ing the use of test-acids corresponding
ivalents, is, that by means of the simple
of Three, the *per-centage* quantity of
may be found, whether 100 or any other
r of grains have been submitted to trial.
The weight of the sample tested (in
) bears the same relation to the equiva-
weight of the alkali under examination,
he number of alkalimeter-divisions or of
ains of test-acid consumed, do to the per-
ge of alkali sought. Thus, with a sample
gr. of pearlash taking 35 alkalimeter-
ons or 350 grains (every 10 gr. being = 1%)
t-acid for neutralisation, this would be—

33 : 47 :: 35 : 49·85%

arly 50 per cent. of pure potassa. By
ituting the equiv. of the dry carbonate *of*
h (69), for that *of pure potassa used*
, *the quantity of that article correspond-*
the same weight of the pure alkali may be at once found. Repeating the last example this will be—

33 : 69 :: 35 : 73·18%

or nearly 73¼ per cent. The same applies to all the alkaline bases and their carbonates.

For commercial purposes, there is used, amongst others, an empirical solution, as a test-acid for potassa, soda, and ammonia, to save the necessity of calculation.

This is dilute sulphuric acid having a sp. gr. of about 1·071; 100 alkalimeter-divisions (1000 water-grains measure) exactly saturate 100 gr. of pure potassa, or 113 gr. of anhydrous carbonate of soda. The number of measures consumed, read off by mere inspection from the scale of the alkalimeter, gives the exact *per-centage* of alkali in the sample examined, for POTASH; and by multiplying it by ·66, that for SODA also. By employing ·362 as the multiplier, it gives the like result for AMMONIA. In fact, occasionally, in order to save the necessity of any calculation, two 'test-acids' are frequently employed—the one for *potash* and the other for *soda.*

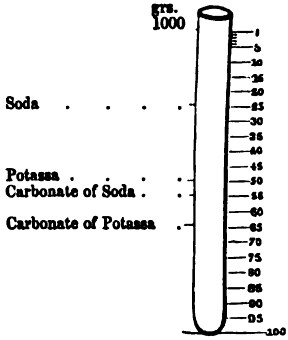
These are made by diluting sulphuric acid to a sp. gr. of near 1·071 and 1·086 respectively; 1000 grains, by measure, of the first, neutralising exactly 100 grains of pure potassa, or 113 of pure anhydrous soda carbonate, and the latter neutralising exactly 100 grains of pure soda, or 171 gr. of pure anhydrous sodium carbonate.

There is another system of preparing standard acids by means of a Faraday's alkalimeter. A strong acid is prepared by diluting sulphuric acid to a sp. gr. of 1·1268 at 60°, and 455·7 grains exactly neutralise 100 of anhydrous carbonate of soda.

The glass tube here referred to, and known as Faraday's ALKALIMETER, is graduated centessimally, in the usual manner; but opposite the numbers 22·1, 48·62, 54·43, and 65, are cut the words '*soda,*' '*potassa,*' '*carbonate of soda,*' and '*carbonate of potassa,*' to indicate the quantity of the *test-acid* to be employed for each of these substances. (See *engr.*) It is used by pouring the *test-liquid* into it until it reaches the line marked against the alkali, or carbonate, under examination, the remaining divisions being filled up with pure water, and the whole well mixed by placing the thumb on the orifice of the tube and shaking it well. The measure of the resulting dilute acid must then be very carefully observed, and more water added, if required, to bring it up to the zero (0) or 1000 gr. on the scale; careful agitation being again employed, as before. The *test-acid* thus prepared, is then added, with the usual precautions, to the sample until exact neutralisation is effected. The quantity consumed for this purpose, read off from the graduated scale, expresses the exact *per-centage* of the pure ALKALI, or of its CARBONATE, as *the case may be, contained* in the sample examined, *provided 100 gr.* have been taken for *the assay.*

Another method sometimes used is that of

M. Mohr, and practised as follows:—The alkaline solution, slightly coloured blue with litmus, is strongly supersaturated with a *standard acid* (sulphuric or oxalic) of known strength, supplied from an alkalimeter in the usual manner; the last traces of carbonic anhydride being removed by boiling, shaking, blowing into the flask, and, finally, sucking out the air. A standard solution of caustic soda (of a strength exactly corresponding to that of the test-acid already used) is now cautiously added, drop by drop, until the colour, rendered yellowish-red by the acid, just appears of a light blue. The difference between the quantity of the solution of the test-alkali and of the test-acid consumed, expresses the exact quantity of acid neutralised by the alkali, and hence, also its strength.



Besides the above methods, the alkaline carbonates are analysed, by the loss of carbonic anhydrid (carbonic acid) they suffer, by being decomposed by a strong acid. The best method in use is that of MM. Fresenius and Will, and depends on the same principle, and is performed in a similar manner and in a similar apparatus to that described under ACIDIMETRY; the only difference being that here the uses of the small tube (*e*) is dispensed with, and that the alkali is tested under the form of carbonate, instead of bicarbonate.

Oper. The smaller flask (*B*) is about half filled with concentrated sulphuric acid, and the sample of alkali, in solution (under the form of carbonate), being placed in the larger flask (*A*), water is added until it is about one third full. The tubes are then fitted into the apparatus quite air-tight; the end of the tube (*b*) is fastened with a piece of wax, and the whole is very carefully weighed. The apparatus is now removed from the scales, and a perforated cork, or a small piece of India-rubber tube, being temporarily applied to the end of the tube (*h*), a few bubbles of air are sucked out of the flask (*B*) by means of the lips; the consequence of which is, that on removing the mouth, the acid in (*B*) ascends to a certain height in the tube (*c*). If in a short time this little column of liquid maintains its height in the tube, it i
that the apparatus is perfectly air-ti
as it should be. Suction is now a
tiously applied to the tube (*h*) and s
the acid in (*B*) made to flow over into
(*A*), the quantity being proportiona
vacuum produced by suction, and ca
being regulated at will. No sooner
acid come into contact with the c
in the flask (*A*), than the evolution of
acid commences, and this, from the
tion of the apparatus, having to pass
the concentrated sulphuric acid, is
quite dry before it can escape by the
into the atmosphere. Whenever the
cence flags, a little more acid is suck
until the whole of the carbonate is
posed; after which an additional qu
made to pass into (*A*), so as to raise
perature considerably, for the purpo
pelling all the gas absorbed by the flui
the operation. As soon as this is effe
wax is removed from the aperture
suction applied to (*h*), until all the
acid in the apparatus is replaced b
spheric air. The whole is now all
cool, and (together with the piece of
moved) is again accurately weighed.
of weight gives the exact amount of
bonic anhydride, or anhydrous carbo
which was contained in the specimen, fro
the weight of PURE ALKALI is readily es
as every 22 *gr.* of dry carbonic acid ga
represents exactly 31 gr. of pure s
gr. of pure POTASSA, &c. &c.; these
being the equivalents of the respect
stances from which the *per-centage*
may be found by the rule of propo
before explained.

Thus, in the case of a 100-gr. sa
carbonate of soda which has lost 15
carbonic acid, by the assay, this woul

22 : 31 : : 15¼ : 21·48

or nearly 21½ per cent. of pure soda.
the equiv. of anhydrous carbonate of
taken, instead of 31 (the eq. of pur
the answer would have been, in the
that substance, 36·748%, or nearly
cent. When an aliquot part of 100
been taken for the assay, either the r
the third term of the proportion, r
course, be multiplied by the denomina
divided by the numerator of the frac
presenting such aliquot part.

By multiplying the weight of *carbon*
dride lost, by the numbers opposite th
of the respective alkalies and their ca
in the second column of the following T
equivalent *per-centage* value of the ca
examined may be obtained in terms corr
ing to the various denominations name
in, when 100 gr., or any aliquot par
gr., have been tested; the result, in th
case, being, of course, multiplied as be

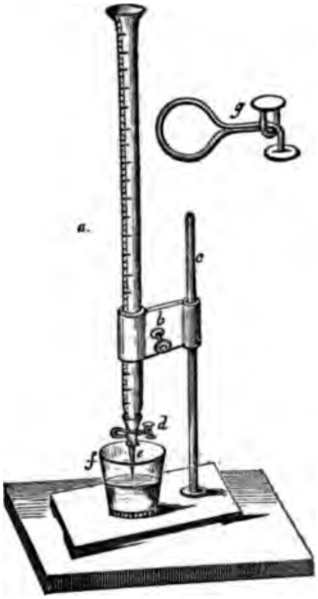
By taking certain standard weights
assay, the quantity of carbonic acid

In this ingenious method of alkalimetry it is absolutely necessary that the whole of the alkali in the specimen tested should be in the state of neutral carbonate. If a sample of potash contains any caustic alkali (as the potashes and pearlash of commerce generally do), Fresenius and Will direct it, previously to being tested, to be triturated with its own weight of pure quartzose sand, and about one third of its weight of carbonate of ammonia; and the resulting mixture, placed in a small iron capsule, or a porcelain crucible, to be moistened with water, and exposed to a gentle heat until it becomes quite dry, and all the ammonia is expelled. If the sample contains any bicarbonate or sesquicarbonate, it must be heated to dull *redness* before being placed in the apparatus and tested. In the case of crude soda (particularly *soda-ash*), the proportion of carbonate of ammonia should be equal to at least one half the quantity operated on. With both alkalies, if the sample contains sulphides, sulphites, or hyposulphites, the same method is to be followed, except that solution of ammonia, instead of water, is to be employed for moistening the powder. To remedy the error which would arise from the apparent amount of carbonic anhydride liberated during the assay, being swelled by the disengagement of 'sulphuretted hydrogen' or sulphurous acid from these substances, a small quantity of neutral (*i. e.* yellow) chromate of potash may be added to the alkaline solution in the flask (*A*); by which they will be converted into sulphates, sulphur, and water, which will remain in the apparatus, the carbonic acid only being evolved. "As most sorts of soda of commerce contain one or other of the substances (just) named, and as it is far more simple to add at once some chromate of potassa to the soda solution, than to test the latter for either of the three salts—it is always advisable to make it a rule, in the examination of SODA, to add some *chromate of potassa.*" (Fresenius.)

If the sodium or other carbonate under analysis contains much chloride, the addition of more sulphuric acid than necessary must be avoided, and the carbonic anhydride expelled by gently heating over a water bath, and not by the addition of excess of acid.

To obviate the difficulties, and to give greater precision and delicacy to volumetrical assays, the instrument known as Mohr's ALKALIMETER, or Mohr's BURETTE, and which is figured in the margin, may be employed. By means of it the test-acid in the graduated tube (*a*) may be added to the alkaline solution in (*f*), in any quantity at a time, however minute, by merely pressing the handles of the clamp (*d*) with the thumb and finger. The terminal tube (*e*) has its lower orifice very small, and it is connected with the burette by means of a small piece of vulcanised India-rubber tube, on which the clamp (*d*) acts. (See *engr.*) The inner cylindrical part of the arm (*b*) is lined with cork, to prevent injury to the glass burette, and to hold it the firmly.

Generally the alkali in the specim amined may be in either the caustic c bonated state, or it may consist of any m of caustic alkali, or carbonates; but absolutely necessary for accurate result it should be *free* from *sulphides*, *sul* and *hyposulphites*, as sulphuric acid acts these substances as well as on carb The presence of chlorides does not in with the accuracy of the assay, un higher degree of heat is employed tha necessary for the expulsion of the ab carbonic acid. The SODA-ASH of com generally contains all these substances l common salt, sulphate of soda, and in matter, which do not interfere. Rough s of POT-ASHES and PEARL-ASH also ge contain some sulphides, though not a quantity. Various plans have been pr to avoid this source of error. The best of MM. Fresenius and Will, given ab which the value of the carbonates is est by their yield of carbonic anhydride.



The difference between an assay of a of the unprepared alkali and of another has been treated as above, indicates the tity of impurities contained in them un forms just referred to. The presence o substances in the commercial alkalies detected by the following tests:—

Sulphides. The addition of sulphur causes the evolution of an odour like bad eggs. The sample in solution y black precipitate with acetate of lead

TABLE II.—*Alkalimetrical Equivalents.*

Grains.			Grains.	
22	Carbonic anhydride (dry).	*are equivalent to*	17	AMMONIA (pure or gaseous).
63	Oxalic acid (crystallised).		43½	Carbonate of ammonia (neutral, hydra
49	Sulphuric acid (liquid, *monohydrated*, sp. gr. 1·8485).		59	Sesquicarbonate of ammonia (Ph. L.; tra lucent, hydrated).
75	Tartaric acid (crystallised).		79	Bicarbonate of ammonia (crystallised).
1000	Dilute sulphuric acid (sp. gr. 1·033).		47	POTASSA (anhydrous).
Water-gr. measure. 1000	„ „ „ (sp. gr. 1·032).		56	Hydrate of potassa (pure caustic potassa).
			69	Carbonate of potassa (anhydrous).
			83	„ „ (granulated, commerci
			87	„ „ (crystallised).
			100	Bicarbonate of potassa (crystallised)
			31	SODA (anhydrous).
			40	Hydrate of soda (pure caustic soda).
			53	Carbonate of soda (anhydrous).
			143	„ „ (crystallised).
			84	Bicarbonate of soda (crystallised).
			83½	Sesquicarbonate of soda (average commercial
			84	Bicarbonate of soda (crystals, or cryst. po der, free from moisture).
			15	LITHIA.
			24	Hydrate of lithia.
			37	Carbonate of lithia.
			76½	BARYTA (pure, caustic).
			85½	Hydrate of baryta.
			98½	Carbonate of baryta.
			28	LIME (pure, caustic; *i. e. quick-lime*).
			37	Hydrate of lime (*slaked lime*).
			50	Carbonate of lime (*chalk; marble*).
			20	MAGNESIA (pure, calcined).
			42	Carbonate of magnesia (dry, neutral).
			48½	„ „ (ordinary commercial).
			52	STRONTIA (pure, caustic).
			61	Hydrate of strontia.
			74	Carbonate of strontia.

ALKALOID. *Syn.* VEGETABLE ALKALI, ORGANIC BASE; ALKALOÏDES (*pl.*, -IDES, or -IDÆ), L.; ALCALOÏDE, ALCALI ORGANIQUE, Fr. In *chemistry*, a name commonly given to any proximate principle of vegetable origin possessing alkaline or basic properties, however feeble. In its most extended sense, the term embraces all organic bases, whether obtained from the animal or vegetable kingdom, or produced artificially. The alkaloids form a numerous and important class of bodies. They exist in nature nearly always in the form of salts, the acid being often, like themselves, peculiar to the plant, or class of plants, in which they are found; whilst the medicinal activity of the latter, in most cases, almost entirely depends on their presence.

Prep. The following general methods of procuring the alkaloids will be found applicable to such as full directions are not given for under their respective heads:—

1. (When the *base* is *insoluble in water, non-volatile*, and *existing in the plant* in an *insoluble form.*) The bruised plant is boiled or macerated in water acidulated with hydrochloric or acetic acid, and the liquor, after filtration, is neutralised with an alkali (ammonia, potassa, lime, or magnesia); the resulting precipitate is purified by re-solution in dilute acid, digestion with a little animal charcoal, and subsequent crystallisation, or re-precipitation with an alkali; or the first precipitate is purified by dissolving it once, or oftener, in boiling alcohol, which yields the PURE ALKALOID either on cooling or by evaporation.

2. (When the *base* is *insoluble in water*, and *non-volatile*, but *existing in the plant* in a *soluble state.*) The bruised or sliced plant is boiled or macerated in water, and the filtered liquor precipitated and otherwise treated as before.

3. (When the *base* is *soluble in water*, and *non-volatile.*) An infusion made with very dilute acid (hydrochloric or acetic), is concentrated by a gentle heat; and the residual liquor treated with potassa (or concentrated solution of ammonia) and ether (conjointly); after repose, the etherial solution is decanted and evaporated. For those alkaloids which are insoluble in ether (as morphia and cinchonia), the previous process may be adopted.

4. (When the *base* is both *soluble in water* and *volatile.*) The vegetable, in a bruised or divided state, or its extract, is alkalised with potassa and distilled; the distillate is neutralised with dilute oxalic or sulphuric acid, and carefully evaporated to dryness; the residuum is next digested in alcohol, and the resulting tincture agitated with potassa and ether, the

is then strained from the insoluble matter, and the latter being washed with water acidulated with acetic acid, the mixed liquors are gently evaporated to dryness in a water bath; the residuum of the evaporation is boiled first with rectified spirit, and next with rectified spirit acidulated with acetic acid; the mixed liquors are again evaporated, the residuum redissolved or diluted with distilled water, and carbonate of soda or potassa added to feebly alkaline reaction, and the whole, after evaporation to the consistence of a syrup, set aside to repose for 24 hours; it is now again diluted with water, filtered, and the insoluble portion washed with cold distilled water, and digested with concentrated acetic acid; this last solution is diluted with distilled water, and decoloured with pure blood-charcoal (if it be necessary); the fluid, either at once, or after cautious evaporation, may then be tested for the alkaloids, in the usual manner. The charcoal previously used should also be tested in the way described below. This method answers admirably with all the NON-VOLATILE ALKALOIDS, and may be applied to the stomach and viscera, and their contents, and to food, &c., in cases of poisoning.

2. (Stas.) The suspected matter, in a finely divided state, is digested, at 160° to 165° Fahr., with twice or thrice its weight of strong alcohol acidulated (according to the quantity) with ½ *dr.* to 2 or 3 *dr.*, or more, of pure oxalic or tartaric acid. After a sufficient time, and when the whole has become quite cold, it is thrown on a filter, and the undissolved portion, after being squeezed dry, is washed with strong alcohol. The mixed and filtered alcoholic liquids are then evaporated at a temperature not exceeding 95° Fahr., and, if no insoluble matter separates, the evaporation is continued nearly to dryness;[1] but if fatty or other insoluble matter separates during the process of concentration, the concentrated fluid is passed through a moistened filter, and the filtrate evaporated nearly to dryness, as before. The residuum is next digested with absolute alcohol, in the cold, the insoluble portion, after filtration, washed with alcohol, and the mixed filtrates again evaporated in the air, or in vacuo. The acid residue is now dissolved in a little distilled water, and bicarbonate of soda added as long as effervescence ensues. To this mixture 4 or 5 times its volume of ether is added, and after lengthened agitation (the bottle or tube being held in a cold wet cloth), the whole is allowed to repose for a short time. A little of the super natant ether is now removed to a small glass capsule or watch-glass, and allowed to evaporate spontaneously.[1] When this leaves oily streaks upon the glass, which gradually collect into a small drop, which emits, when gently heated, a disagreeable, pungent, and stifling odour, the presence of a LIQUID
BASE OR ALKALOID is inferred; whil
residue or a turbid fluid with small
ticles floating in it, indicates a NON-
SOLID BASE.[3] In either case the bl
of reddened litmus is permanently
by the residuum. If no residuum
the capsule, some solution of pure
potassa is added to the liquid, the
agitated for several minutes, and
(after repose) decanted; an operatio
repeated with fresh ether a second,
even a fourth time. The base, or bas
are present), will now be found in t
ethereal solution, which is, therefore,
before. The presence of an alkal
detected, the mixed ethereal solu
allowed to evaporate spontaneously, c
taken, if a volatile alkaloid be presen
tralise the liquid with an acid before
evaporation. The last residuum is th
for the particular alkaloid present, a

This method, according to Stas, ans
for all the ALKALOIDS which are s
ether; including—ACONITIA, ANILINE,
BRUCIA, CODEIA, COLCHICINA, CON
PHIA, EMETINA, HYOSCYAMINE, MOR
NICOTIA, PETININE, PICOLINE, S
STRYCHNIA, VERATRIA, &c. By
it Stas found nicotia in the heart
a poisoned dog. With such alkaloi
however, only very sparingly soluble
(as morphia, for instance,) the res
necessarily, be doubtful. To detect
well as all the alkaloids which are
in ether, it is, therefore, necessary, a
by Otto, to add to the alkaline flui
the decantation of the ether, sufficien
of soda to dissolve the morphia, &c
has separated,) and after the expulsi
last traces of the ether by a gentle
add a concentrated solution of hydroc
ammonia, and to allow the mixture
for some time in the open air. W
PHIA is present, it separates under th
small crystals.[4] Or the alkaline li
be diluted with distilled water, an
with charcoal, and this with alcoh
manner noticed under method 4 (*bel*

4. (Graham and Hoffmann—slig
dified.) 2 or 3 *oz.* of *purified anima*
are digested in about ½ gal. of the (
only slightly acid) aqueous fluid und
nation, with frequent agitation, for
hours, or longer. The *liquid* is the
and the charcoal left on the filter
twice with cold distilled water. The
is then boiled for ½ an hour with
pint of rectified spirit of 80 or 90%;
lition being conducted in a flask havi
long tube, open at both ends, fitted
through the cork, to prevent loss of t

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[1] The evaporation according to Stas, should be conducted under a bell-glass over sulphuric acid, with or without rarefaction of the air; or in a tubular retort through which a current of air is made to pass.

[2] A merely disagreeable animal odour, w
gency, is here disregarded.

[3] "*Bulletin de l'Académie de Méd. Belgiq*
"*Jahrb. f. prakt. Pharm*," xxiv, 313; &c.

[4] Otto's "*How to detect Poisons.*"

tioned, are very soluble in alcohol, insoluble in ether, and only slightly soluble in water. Those with *morphia* and *brucia* are sufficiently marked to prevent these alkalies from being mistaken for each other; and those with *brucia* and *strychnia* are, in like manner, easily distinguishable.

The principal Alkaloids and their Salts, in the state of powder, or with 'conia' and 'nicotia,' in the state of an oily looking liquid, may be thus distinguished:—

1.—*a.* The powder is treated with nitric acid:—It is coloured red; probable presence of Brucia, Delphia, Morphia, or commercial Strychnia. If the reddened acid becomes violet on the addition of 'protochloride of tin,' it is BRUCIA; if it becomes black and carbonaceous, it is DELPHIA. If the powder is fusible without decomposition, and strongly decomposes iodic acid, it is MORPHIA; if it is not fusible without decomposition, and does not decompose iodic acid, it is STRYCHNIA.

b. If instead of a red, the powder strikes a green colour with nitric acid, it is SOLANIA; if it is insoluble in 'ether,' and not reddened by 'nitric acid,' it is EMETIA; if soluble in ether, not reddened by 'nitric acid,' but melts and volatilises when heated, it is ATROPIA; if it is thus affected by ether or nitric acid, but does not volatilise, it is VERATRIA. (See 2, *below*.)

2. The powder, or (with 'conia and nicotia') concentrated liquid, is treated with a drop or two of concentrated sulphuric acid:—A red colour is produced; probable presence of *Brucia, Nicotina, Salicine,* or *Veratria.* If the reddened mixture has at first a roseate hue, turning deep red on the addition of nitric acid, it is BRUCIA; if the original substance moistened with solution of potassa evolves the odour of tobacco, it contains NICOTINE; if the red colour produced by the acid is permanent and of an intense blood-hue, and the powder agglutinates into lumps like resin, it is SALICINE; if the colour is at first yellowish, changing to blood-red, and ultimately to crimson and violet, it is VERATRIA.

b. If instead of the substance being 'reddened' by strong sulphuric acid, no particular action ensues in the cold, it contains either *Conia* or *Strychnia;* if a small fragment of bichromate of potassa being now dropped in, produces a rich violet colour, it is STRYCHNIA; if the original matter on being heated, or treated with solution of potassa, evolves a penetrating, disagreeable odour, somewhat analogous to that from 'hemlock,' or to a mixture of those from tobacco and mice, it is CONIA.

The presence of one or more of the alkaloids being shown by any of the preceding methods, a portion of the original clear solution or powder, or of the precipitates or filtrates above referred to, must be treated with their 'characteristic tests,' as given under the individual notices of these articles, so as to set s all doubt as to their identity. No test must ever be relied on as a p proof. The presence of *Brucia, Morph* *Strychnia,* may be determined in subs which after being mixed with the s these alkaloids have undergone the a vinous, or putrefactive fermentation, as by Orfila, MM. Larocque and Thibierg many other eminent chemists and toxicol and confirmed, in numerous cases, l own experiments. *Opium* and *Morphi* thus be readily detected in beer, wine, and milk.

Concluding remarks. It is a singul that none of the organic bases found in have yet been formed artificially, alt several analogous substances have bee produced. Closely allied to the alkaloid also exists an extensive series of neutral mate principles, which differ from thos stances chiefly in the absence of basic pro and in most of them being destitute of ni They are usually bitter, and, like the all usually represent the active properties plants in which they are found; whils of them possess considerable medicinal Of this kind are *asparagine, elaterine, gen* *picrotoxine, salicine,* &c. These two of bodies, though actually distinct, a quently confounded. See ALKALI, O BASES, POISONS, PROXIMATE PRIN VEGETABLE SUBSTANCES, NOMENCL &c.; also the individual alkaloids unde respective heads.

AL'KANET. *Syn.* ANCHU'SA, L.; NETTE, Fr.; ORKANET, Ger.; OR'CHL DYER'S AL'KANET, D. BU'GLOSS*. The *a* *tincto"ria* (Willd.; *lithosper'mum tinct* —Linn.), a deciduous herbaceous plan a perennial, dark blood-red root. *Ha* Minor, Greece, Hungary, &c. It is also cultivated in the neighbourhood of Mont The *dried root* (ALKANET ROOT; RAD CHUSÆ, R. A. TINCTORIÆ) is chiefly in from the Levant. It contains a be blood-red colour, which it freely gives oils, fats, wax, spirits, essences, and substances, by simply infusing it in the is consequently much employed to colou articles. Wax tinged with it, and app warm marble, stains it of a rich flesh- which sinks deep into the stone, and p considerable durability. Its spirituous t also imparts a deep red to marble.

Prop., &c. The colouring matter of was regarded by Pelletier as a fat (ANCHUSIC ACID); but it has since been to be a species of resin (ANCHUSINE, P ALKANNINE, P.-ALKANIUM). Accord Dr. John, good alkanet root contains cent. of this substance. *Anchusine* m 140° Fahr.; is scarcely soluble in w which it only imparts a dirty red colo is very soluble in alcohol, oils, and aceti Alkalies turn it blue. It is found wl

ALLOY'. *Syn.* ALLIAGE, Fr.; LEGIRUNG, VERMISCHUNG DURCH SCHMELZEN, Ger. In *coinage*, a compound of the precious metals with another, or others, of less value; also the least valuable metal, or metals, in such compounds. In *chemistry* and *metallurgy*, combinations of the metals with each other usually obtained by fusion. When mercury is one of the component metals, the compound is termed an AMALGAM.

Prep., &c. No general rules can be given for this purpose. Alloys of metals differing greatly in fusibility, are commonly made by adding the more fusible one, either in the melted state, or in small portions at a time, to the other melted, or heated to the lowest possible temperature at which a perfect [illegible] will take place between them. The mi[illegible] is usually affected under a *flux*, or some [illegible]rial that will promote liquefaction, and pre[illegible] volatilisation and unneccessary exposure t[illegible] air. Thus; in melting lead and tin toge[illegible] for solder, resin or tallow is thrown [illegible] the surface; in tinning copper, the su[illegible] is rubbed with *sal ammoniac*; and in [illegible]bining some metals, powdered charcoal is [illegible] for the same purpose. Quicksilver com[illegible] with many metals in the cold, forming A[illegible]GAMS.

Comp. The following *Table* exhibits [illegible] composition of the more important compo[illegible] of this class:—

Table of the principal Alloys.

NAMES.	COMBINING METALS.
ALBATA	See German silver.
AMALGAMS	Mercury and other metals.
BATH-METAL	Copper and zinc.
BELL-METAL	Copper and tin.
BRASS	Copper and zinc.
BRITANNIA METAL	Tin with antimony, copper, and bismuth.
BRONZE	Tin and copper.
CANNON-METAL	Tin and copper.
DUTCH GOLD	Copper and zinc.
FUSIBLE METAL	Bismuth, lead, and tin.
GERMAN SILVER	Copper, nickel, and zinc, with, sometimes, a little iron and tin.
GOLD (*standard*)	Gold with copper.
„ (*old standard*)	Gold with copper and silver.
GUN-METAL	See Cannon-metal.
MOSAIC GOLD	Copper and zinc.
OR-MOLU	„ „
PEWTER (*common*)	Tin and lead.
„ (*best*)	Tin with antimony, bismuth, and copper.
POT-METAL, COCK-METAL	Copper and lead, with, sometimes, a little zinc.
QUEEN'S METAL	Tin with antimony, bismuth, and copper.
SHOT-METAL	Lead with a little arsenic.
SILVER (*standard*)	Silver and copper.
SOLDER	Tin and lead.
SPECULUM-METAL	Tin and copper, and arsenic
STEREOTYPE-METAL	Lead, antimony, and bismuth.
TOMBAC, RED TOMBAC	Copper and zinc.
TUTANIA	See Britannia metal.
TYPE-METAL	Lead and antimony.
WHITE COPPER (*Packfong; White tombac*)	Copper and arsenic.

Prop., &c. Alloys generally possess characteristics unshared by their component metals. Thus; copper and zinc form brass, which has a different density, hardness, and colour to either of its constituents. Whether the metals tend to unite in equivalent proportions, or in any definite ratio, is still undetermined. The evidence afforded by the natural alloys of gold and silver, and by the phenomena accompanying the cooling of several alloys from the state of fusion, goes far to prove that such is the case. (Rudberg.) The subject is, however, one of considerable difficulty, as metals and metallic compounds are generally soluble in each other, and unite by simple fusion and contact. That they do not combine indifferently with each other, but exercise a species of elective affinity not dissimilar to other bodies, is clearly shown by the homogeneity and superior quality of many alloys in which the constituent metals are in atomic proportion. The variation of the specific gravity and melting-points of alloys pable of ripening its fruit in this country, and is, therefore, only grown here for the sake of its beautiful vernal flowers. There are several varieties, of which the most important are the *sweet* and the *bitter*, so named from the flavour of the *seed* or *kernel*. These, for the most part, resemble each other in appearance. De Candolle ('Prodromus,' ii, 580) gives five varieties of this species:—A. AMA''RA (*bitter-almond*); A. DUL'CIS (*sweet-a*); A. FRAGILIS (frăj'-; *tender-shelled a.*); A. MACROCAR'PA (*large-fruited a., pista'chio a., sultana a.*); A. PERSICOI'DES (*peach-a.*).

Per'sian Almond. The peach.

AL'MONDS (-mŭndz). *Syn.* AMYG'DALÆ, L.; AMANDES, Fr.; MANDELN, Ger. The seed or kernels of the almond-tree. They are met with in commerce both in the shell (AMYG'DALÆ CUM PUTAM'INE, -ĭn-e, L.), and shelled (AMYGDALÆ, L.). In the retail shops, most commonly in the latter form. Those rancid, broken, or worm-eaten, should be rejected.

Bitt'er Almonds. *Syn.* AMYG'DALÆ AMA''RÆ, L.; AMYGDALA AMARA, Ph. E.; AMANDES AMÈRES, Fr.; BITTERE MANDELN, Ger. A variety imported from Mogadore, chiefly characterised by possessing the bitter flavour, and, when rubbed with water, the odour of peach-kernels. They are also smaller and thicker than the sweet almond.

Uses, &c. Bitter almonds are used to relieve the flavour of sweet almonds, to clear muddy water, and to flavour confectionery, liqueurs, &c. By pressure, they yield their bland oil (OIL OF ALMONDS; O'LEUM AMYG'-DALÆ, L.); the resulting cake (BITTER-A. CAKE; PLACEN'TA A. AMARÆ, L.) is distilled for the volatile oil (ESSENTIAL OIL OF A.; O. A. A., L.), and is afterwards again pressed into cakes (A.-CAKE) and used to fatten pigs, and for other purposes. Bitter almonds are now seldom employed in medicines, although it is said that they have cured 'intermittents' when bark had failed (Bergius), and that their emulsion has been found useful in pulmonary and dyspeptic affections, hooping-cough, and asthma; and externally, as a lotion in acne. (Thomson.) In large quantities they are poisonous, and even in the smallest quantities have been known to produce nettle-rash (*urticaria*), and other unpleasant symptoms. They have long been in repute as an antidote to intoxication. The ancient bacchanals chewed them at their orgies, to lessen the effects of wine, and to enable them to take it in larger quantities with impunity.

Blanched' Almonds (blăncht'-). *Syn.* AMYG'-DALÆ DECORTICA'TÆ, L. Almonds from which the *husk* or *seed-coat* has been removed. This is effected by soaking them for a short time in warm water, until the skin can be easily removed by pressure between the thumb and forefinger. They are then peeled, rinsed in cold water, drained, and dried. When intended for the table, the last is effected by wiping them with a soft towel; but when
intended to be powdered, or kept, they
by a very gentle heat in a stove, or in

Burnt' Almonds. *Syn.* ROASTED AL
ALMOND COFFEE. Used to colour and
liqueurs and confectionery; and formed
substitute for coffee.

Guia'na Almonds (ghe-ăh'-nă; *g*
Brazil-nuts.

In'dian Almonds. The fruit of *ter*
catappa (Linn.). They are oleaginou
nutritious; and are used as a substit
almonds.

Ja'va Almonds (jăh'-). The nuts or
of *canarium commune* (Linn.). Th
eaten, made into bread, and pressed fo
oil.

Sweet' Almonds. *Syn.* ALMONDS;
DALÆ, L.; A. DUL'CES, Ph. D.; AMY
A. JORDAN'ICA, Ph. L.; A. DUL'CIS,
& Ph. L. 1836; AMANDES, AMANDES D
Fr.; SÜSSE MANDELN, Ger. These a
well-known dessert or table fruit of the
and are the kind always referred to
'almonds' (simply) are spoken of or ord

Comm. var.—1. JOR'DAN ALMONDS,
are the finest, and are imported from
Of these there are two kinds; the one, ab
inch in length, flat, and with a clear
cuticle, sweet, mucilaginous, and rather
the other, more plump, and pointed
end, brittle, but equally sweet wit
former.—2. VALEN'TIA A. (which com
in quality) are about ⅝ths of an inch
not quite an inch long, round at one en
obtusely pointed at the other, flat, of a
brown colour, with a dusty cuticle.—3.
BARY and ITAL'IAN A., which resemb
latter, but are generally smaller an
flattened.—4. A variety, of medium q
imported in baskets from Spain.

Uses, &c. Sweet almonds are nu
emollient, and demulcent; but frequent
agree with weak stomachs. The husk
to occasion indigestion and nausea. Ow
a peculiar idiosyncrasy of some habits, d
sia, diarrhœa, œdematous swelling of th
and urticaria (*nettle-rash*), sometimes, t
seldom, follow the use of unblanched al
Blanched almonds do not produce these
veniences, and, therefore, should be pr
for the table. In *medicine*, almonds a
ployed chiefly under the form of emulsio
fection, &c., and to suspend oily substan
water. Their uses for dietetical purpo
well known. Preparations of them a
employed as cosmetics. The cake left
expressing the oil (ALMOND-CAKE), is u
washing the skin, which it is said to
beautifully soft and clear. *See* ALMOND
&c.

AL'NIGHT† (awl'-). A cake of wax
wick in the midst. The forerunner of,
rude form of the modern dumpy night
called MORTARS.

AL'OE (ăl'-o). *Syn.* AL'OË (-o-ē), L., SHEEP, 15 to 30 gr.;[1]—DOGS, (*small* ones) 10 to 30 gr., (*middle-sized*) 20 to 40, or even 60 gr., (*large*) ½ to 1 dr., or even 2 dr.

Aloes is also used in dyeing; and as a colouring matter in stains, lacquers, and varnishes. Aloes, and several of its preparations, are likewise extensively employed to adulterate porter.

Var. These, arranged in the order of their reputed *medicinal value*, are—Socotrine, Hepatic, Barbadoes, Cape, &c.; and *alphabetically*, as given below:—

Barba'does Aloes. *Syn.* ALOES IN GOURDS; AL'OË BARBADEN'SIS, L., Ph. L. & E. Imported from Barbadoes and Jamaica, usually in gourds; sometimes in boxes. The best is the inspissated juice of the cut leaf of *aloë vulga"ris;* an inferior quality is prepared from the decoction.—*Char., &c.* Opaque, lustreless, of a liver colour, a little tending to black, with a bitter nauseous taste, and a very disagreeable odour, especially when breathed on; *powder*, a dull olive-yellow. It is the 'hepatic aloes' of most continental writers, and said to be the 'Αλόη of Dioscorides. It is more active than the other varieties of aloes; but is also more apt to occasion hæmorrhoids, and to gripe, than any of them.

Cab'alline Aloes (-līne). *Syn.* FŒT'ID ALOES, HORSE A.; ALOË CABALLI'NA, A. GUINIEN'SIS, L.; ALOÈS CABALLIN, Fr. From *aloë In'dica* (O'Shaughnessy); or from *aloë spica'ta* by long and careful boiling (Lindley). *Used* only by farriers. Scarcely known in English commerce.

Cape Aloes. *Syn.* ALOË CAPEN'SIS, A. LU'CIDA (*Geiger*), L. Imported from the Cape of Good Hope, and obtained from *aloë spicd'ta*, and other Cape species. Odour, stronger and even more disagreeable than that of Barbadoes aloes; colour, deep greenish-brown; appearance, shining and resinous; fracture, generally glassy; *powder*, a lively greenish-yellow; almost completely soluble in boiling water, decoction paler than that of other kinds. It is weaker than Barbadoes or even hepatic aloes, and is more apt to gripe, &c., than the latter. A finer kind, known as '*Bethelsdorp aloes*,' imported from Algoa Bay, is more of a liver colour, and softer than the preceding, and hence often called CAPE HEPATIC-ALOES.

Hepat'ic Aloes. *Syn.* BOMBAY' ALOES*, EAST-INDIA A.*, LIVER-COLOURED SOCOTRINE A.*; ALOË HEPAT'ICA, Ph. L. & D.; A. IN'DICA, Ph. E. Imported from Bombay and Madras. It is usually said to be obtained from "uncertain species of aloes;" but it is almost certain that it is "the juice of the Socotrine aloes plant which has been solidified without the aid of artificial heat."[2]—*Char., &c.* "Opaque, of a liver colour, bitter taste, and an unpleasant odour." (Ph. L.) It is less odorous, darker coloured, and more opaque than Socotrine aloes; its powder has also a duller colour; and weak spirit leaves much undissolv matter. Its decoction on cooling frequ deposits a yellow powder. The finer a brighter varieties of *hepatic aloes* are co monly sold for 'Socotrines,' and their medici virtues are nearly similar. (See *below.*)

In'dian Aloes (various):—1. Deep brown black, very opaque, and less soluble than o nary aloes. Scarcely known in commerce.— Several varieties ranging in character fr 'Cape aloes' to 'hepatica,' and occasionally t 'Barbadoes,' obtained from several species.

Mo'cha Aloes (-kă*h*). *Syn.* ALOË DE MOC L. Imported from Muscat. An inferior ki of Indian aloes. (Christison.) It is obtai from the same plant as produces genuine hep tic aloes. (Lindley.) It holds an intermedi position between 'Cape' and 'hepatics,' b contains much impurity; the latter oft amounting to upwards of 25%. Some specim are, however, of excellent quality. Whe melted and 'doctored,' it is sold for Barbadoes, hepatic, and even Socotrine aloes.

Soc'otrine Aloes (-trĭn; sŭk'-‡). *Syn.* SOCOTORINE ALOES, SMYR'NA A., TUR'KEY A.; ALOË SOCOTRI'NA, Ph. L.; ALOË, Ph. L. 1836; A. SOCOTORI'NA, Ph. E. "The juice of the cut leaf of uncertain species hardened by the air." (Ph. L.) Genuine Socotrine aloes is generally supposed to be obtained from *aloë spica'ta;* but is referred to by De Candolle to a distinct species, *a. Socotri'na;* and by Martius, also to *a. purpuras'cens.* Formerly this variety was brought from the Island of Socotra or Zocotora (hence the name), by way of Smyrna and Malta; but it is now chiefly obtained from Bombay and Madras.—*Char., &c.* Colour, garnet red to golden red; smell, peculiar and aromatic, not unlike a decaying russet apple, especially when fresh-broken, or breathed on, or warmed; taste, permanently and intensely bitter; fracture, conchoidal; softens in the hand, and becomes adhesive, yet retains considerable brittleness; *powder*, bright golden-yellow colour; central portions of the lumps often soft, especially when first imported. "It is brittle, bitter, of a reddish-brown colour, and an aromatic odour. Light permeates thin recently broken laminæ." (Ph. L.) "In thin pieces, translucent and garnet red; almost entirely soluble in spirit of the strength of sherry. Very rare." (Ph. E.)

Socotrine aloes are always preferred for medicinal purposes, and are the only variety used in perfumery, varnishes, and other nice purposes in the arts.

Strained Aloes. *Syn.* MELTED ALOES; ALOË COLA'TA, L. *Proc.* 1. The *aloes* are melted in a copper pan, by the heat of steam or a water bath, and are then pressed through a strong hair or wire sieve, and allowed to cool.

2. As above, but with the addition of about twice its weight of water; the decoction being strained and evaporated.

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[1] Aloes, however large the dose, often fails to purge sheep. In *very large* quantities it is *poisonous* to them.

[2] Pereira, "*Elem. Mat. Med. and Therap.*," vol. ii, 188, 4th Ed.; "*Pharm. Journ.*," vol. xi.

percolation, as Tincture of Calumba.—*Dose.* 1 to 2 fluid drachms.

Infusion of Alstonia. (*Infusum Alstoniæ.*) Take of alstonia bark, bruised, ½ an ounce; boiling water, 10 fluid ounces. Infuse in a covered vessel for an hour and strain.—*Dose.* From 1 to 2 fluid ounces twice or thrice daily. A good serviceable tonic.

AL'TERATIVE (awl′-tĕr-ă-tĭv). *Syn.* AL'TERANT*; AL'TERANS (ăl′-), L.; ALTÉRANT, ALTÉRATIF, Fr. In *medicine*, having power to alter; applied to substances and agents which occasion a change in the habit or constitution, and thus re-establish the healthy functions of the body, or any part of it, without producing any sensible evacuation or other obvious effect.

AL'TERATIVES (-tĭvz). *Syn.* ALTERAN'TIA, L.; ALTÉRATIFS, &c., Fr. Alterative medicines or agents. The preparations of mercury and iodine, when properly administered, are the most useful members of this class; and are those which are now the most generally employed.

ALTHE'IN (ăl-thē′-ĭn). *Syn.* ALTHÆ'INA, L. The name given by Braconnot to a substance identical with *asparagin*, which he discovered in the 'marsh-mallow' (*althæ'a officina'lis*, Linn.).

AL'UDEL (-ū-). In *chemistry*, a pear-shaped glass or earthen pot open at both ends, formerly much used for connecting other vessels in the process of sublimation. A number of them joined together are still employed for the distillation of quicksilver, in Spain.

AL'UM. $K_2SO_4 . Al_2(SO_4)_3 . 24Aq$. *Syn.* POT'ASH-ALUM, SUL'PHATE OF ALUMINUM AND POTASSIUM, COMMON ALUM; ALU'MEN, A. POTAS'SICUM, L.; ALUN, SULFATE D'ALUMINE ET DE POTASSE, Fr.; ALAUN, Ger.; ALUME, Ital.

The principal alum-works in England, until recently, were those of Lord Glasgow, at Hurlett and Campsie, near Glasgow, and those of Lords Dundas and Mulgrave, at Whitby, Yorkshire (est. 1600); but those of Mr. Spence, at Manchester, and at Goole (Yorkshire), and of Mr. Pochin, at Manchester, are now among the largest, if they be not actually the largest in the world. There are also extensive alum-works at and near Newcastle-on-Tyne; but none of importance, as we know of, in any other part of these realms.

Nat. hist. Alum is found native in some places (NATIVE ALUM), either effloresced on the surface of bituminous alum-schist (Göttwigg, Austria); or united with the soil in the neighbourhood of volcanoes (Solfatara, Naples); when it may be obtained by simple lixiviation and evaporation, a little potash being commonly added to convert the excess of sulphate of alumina present into alum. It is also found in certain mineral waters (East Indies).

Sources. The alum of commerce is usually obtained from schistose pyritic clays, commonly termed alum-ores, aluminous shale, a.-schist, &c.; and from alum-rock, a.-stone, or alunite. At La Tolfa, Civita Vecchia, where the best Roman-alum is produced, the source is stratified alum-stone. On the Continent and in Great Britain, it is generally pyritaceous clays, volcanic aluminous ores, aluminous shale, or alum-slate. These minerals contain sulphide of iron, alumina, bitumen or carbon, and frequently a salt of potassium. Of late years large quantities of alum have been prepared on the banks of the Tyne from aluminous clay.

Prep. The manufacture of alum is technically said to be conducted according to the *natural process* when prepared from alum-schist or alum-ore; and according to the *artificial process* when made by acting on clay with sulphuric acid, and adding a potassium salt to the resulting lixivium. The following are the details of these processes:—

a. From ALUM-ORE, ALUMINOUS SCHIST, or SHALE, &c.:—

1. The *mineral* (alum-ore, a.-schist, &c.), is placed in heaps, and moistened from time to time with water, when it becomes gradually hot, and falls into a pulverulent state. The decomposition commonly occurs either wholly, or partially, on the floor of the mine. If the ore does not possess this property on mere exposure to air and moisture, it is broken into pieces and laid upon a bed of brushwood and small coal, to the depth of about four feet, when the pile is fired and fresh lumps of the alum-mineral thrown on, until the mass becomes of considerable height and size. The combustion, as soon as established, is conducted with a smothered fire, until the calcination is complete; care being taken to prevent fusion, or the disengagement of either sulphurous or sulphuric acid, from contact between the ignited stones and the carbonaceous fuel.[1] To promote these ends the pile, at the proper time, is 'mantled' (as the workmen call it) or covered with a layer of already calcined and exhausted ore, in order to protect it from high winds and heavy rains; as also to moderate the heat, and let it proceed gradually, so that the sulphur present may not be lost or wasted by volatilisation. The roasting is finally checked by a thicker 'mantling,' and the whole allowed to cool. By this time the pile has usually lost about one half its bulk, and become open and porous in the interior, so that the air can circulate freely through the mass; the latter, in dry weather, as the heap cools, being usually promoted by sprinkling a little water on it, which, by carrying down some of the saline matter, renders the interior still more open to the atmosphere. The whole, when cold, or nearly cold, is, if

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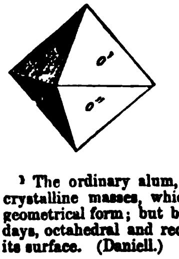
[1] The generality of *alum-minerals* require roasting; and their own bituminous matter is, in many cases, sufficient to produce the heat required, which need not necessarily exceed 600 to 650° Fahr., provided it be continued for a sufficient period. It is only when they are less bituminous or carbonaceous that *slack* or *saw-dust*, &c., is employed.

movable sides, where, in a few minutes, it heats violently and boils. The thick liquid gradually becomes thicker, until it is converted into a solid porous mass; the pores being produced by the bubbles of steam which are driven through it, owing to the heat resulting from the reaction of the ingredients on each other. This porous mass (ALUM-CAKE; CONCENTRATED ALUM) appears perfectly dry, although retaining a large amount of combined water. It also contains all the silica of the original clay, but in such a state of fine division, that the whole appears homogeneous; whilst it imparts a dryness to the touch which can scarcely be given to pure sulphate of alumina. From this substance a solution of pure sulphate of alumina is easily obtainable by lixiviation, and allowing the resulting solution to deposit its silica before using it; but for many purposes the presence of the finely divided silica is not objectionable. The sulphate-of-alumina solution, so obtained is adapted to all the purposes in dyeing for which alum is now employed; the sulphate of potash or of ammonia in the latter being an unnecessary constituent, and one merely added to facilitate the purification and subsequent crystallisation of the salt. To obtain ALUM from the porous alum-cake (the proper proportion of acid having been used in its preparation, or subsequently added), it is only necessary to precipitate its concentrated solution with a strong solution of a salt of potash, or of ammonia, or a mixture of them, and to otherwise proceed as before.

Ratio. In the above process the sulphide of iron of the shale or schist is converted by atmospheric oxygen into sulphate of iron and sulphuric acid; the sulphuric acid decomposes the clay, setting silica free, and producing sulphate of aluminum. The sulphate of iron is mostly got rid of by concentrating the solution of the mixed sulphates, and the mother-liquors are converted into alum by the addition of the salt of potassium. When chloride of potassium is used, it yields chloride of iron and sulphate of potassium, the latter combining with the sulphate of aluminum, and the former remaining behind in the mother-liquor. See ALUMS (in Chemistry).

Comp. Potassium alum has the formula $K_2SO_4 . Al_2(SO_4)_3 . 24Aq$.



Prop. Alum crystallises in regular octahedrons, often with truncated edges and angles; (see *engr.*;) and sometimes in cubes, but only when there is a deficiency of acid in its composition, with the alkali in slight excess of the proper quantity. (Löwel.)[1] It is slightly efflorescent in dry air; soluble in 18 parts of cold water, an rather less than its own weight of bo water; tastes sweet, acidulous, and astringent; is styptic; and reddens lit When heated it melts, loses its water of tallisation, and becomes white and sp (DRIED ALUM); a strong heat, short of w ness, decomposes it, with the evolutio oxygen and a mixture of sulphuric and phurous anhydride; calcined with carbona matter it suffers decomposition, and form a pyrophoric residuum (HOMBERG'S PYR ORUS). Ignited with alkaline chlo hydrochloric acid is liberated; which also o when their concentrated solutions are b together. Ammonia precipitates pure hy of aluminum from potassium alum; but a subsulphate from the simple sulphat alumina. Sp. gr. 1·724; but, when contai ammonia, often so low as 1·710.

Tests, &c. It is easily recognised by crystalline form, its taste, and by its com solubility in water. Its aqueous solution a white gelatinous precipitate soluble in ex a platinum wire moistened with the sol imparts a violet colour to the blowpipe fl and chloride of barium gives a white precip insoluble in nitric acid.

Pur. When pure, its solution is not aff by tincture of galls, sulphuretted hydr ferrocyanide of potassium, nor solutio nitrate of silver. Heated with caustic pot or quick-lime, it does not evolve fume ammonia.

Adult., &c. The principal impurity, and which renders alum unfit for the use of dyer, is iron. This may be readily detecte the blue precipitate it gives with ferrocya of potassium, or the black precipitate sulphide of ammonium, which are very del tests.[2] Lime, another very injurious tamination, may be detected by precipit the alumina and iron (if any) with amm and then adding oxalate of ammonia to boiled and filtered liquid. The liquid filt from the last precipitate (oxalate of lime) still contain magnesia, which may be dete by the white precipitate caused on the add of an alkaline phosphate. Common frequently contains ammonia, from urine the crude sulphate of the gas-works, ha been employed in its manufacture. Powd alum is frequently adulterated with com salt, in which case it gives a white curdy cipitate with nitrate of silver, turning blac exposure to the light.

Phys. eff., &c. In small quantities acts as an astringent; in larger doses, a irritant. It acts chemically on the an tissues and fluids, is absorbed, and has discovered in the liver, spleen, and (Orfila), the last often becoming acid (Kr Externally, it is astringent. The al calcination, &c., to which they are subjected.

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[1] The ordinary alum, of commerce, consists of large crystalline masses, which do not present any regular geometrical form; but by immersion in water for a few days, octahedral and rectangular forms are developed on its surface. (Daniell.)

[2] Good English alum contains less than 0·1% of The best Roman or Italian alums seldom contain than ·005% of iron-alum, notwithstanding their ext colour.

The following is the per-centage compositi of certain alum shales :—

	Whitby, Yorkshire. (*Rickardson.*)	
	Top rock.	Bottom rock.
Sulphide of iron (*pyrites*)	4·20	8·50
Silica	52·25	51·16
Protoxide of iron	8·49	6·11
Alumina	18·75	18·30
Lime	1·25	2·15
Magnesia	·91	·90
Oxide of manganese	traces	traces
Sulphuric acid (SO_3)	1·37	2·50
Potassa	·13	traces
Soda	·20	traces
Chlorine	traces	traces
Coal	4·97	8·29
Water	2·88	2·00
Loss	4·60	(?)
	100·	100·

	Campsie, near Glasgow. (*Ronalds.*)		
	Top rock.	Top rock.	Botto rock.
Sulphide of iron (*pyrites*)	40·52	38·48	9·63(
Silica	15·40	15·41	20·47(
Protoxide of iron	—	—	2·18
Alumina	11·35	11·64	18·91(
Lime	1·40	2·22	·40
Magnesia	·50	·32	2·17
Oxide of manganese	·15	—	·55
Sulphuric acid	—	—	·05
Potassa	·90	—	1·26
Soda	—	—	·21
Carbon or bituminous matter	27·65 (?)	28·80	(?)
Coal	—	—	8·51
Water	—	—	8·54
Loss	2·13 (?)	3·13	1·59(?
	100·	100·	100·

Alum-rock, or alum-stone, is a species of impure *alunite*, and is not of very common occurrence. That of Tolfa, near Civita-Vecchia, according to Klaproth, consists of—

Silica	56·5
Alumina	19·
Sulphuric acid (SO_3)	16·5
Potassa	4·
Water	3·
Loss	1·
	100·

which exhibits an excess of about 3$\frac{5}{8}$ of sulphuric acid, and about 14$\frac{5}{8}$ of alumina, more than are requisite to form alum with the 4$\frac{0}{0}$ of potassa; proportions which, therefore, require to be supplemented with a potassium-salt during the process of manufacture. The alum-stone of Mont d'Or contains, according to Cordier, 1·4$\frac{1}{2}$ of oxide of iron.

The presence of lime in alum-ore is most prejudicial, owing to its affinity for sulphuric acid being greater than that of either alumina or iron. Ores containing it in any quantity are, therefore, unfitted for the manufacture of alum. Magnesia is also prejudicial; but in this case, the sulphate of magnesia left in the mother-liquors is not wholly valueless, as it may be crystallised and sold as 'Epsom-salt,'—a thing which is actually done in some English alum-works.

The potash-salt employed by the alum-makers is either the sulphate or the chloride—chiefly the latter; its sources being the waste liquor of soap-works, saltpetre refineries, and glass-houses. Wood-ashes, though rich is potash, do not answer well unless freed by lixiviation from the large amount of car bonate of lime which is always present in them.

The ammonia-salt used in making alum i generally the crude sulphate prepared from the waste ammoniacal liquor of gas-works or that from the manufacture of sal-ammonia by the destructive distillation of animal matter. Both these liquors may be used without previous conversion into sulphat of ammonia whenever there is an excess of sulphuric acid in the aluminous solu tion.

Soda-salts are seldom, if ever, used as pre cipitants in the manufacture of alum, o account of the easy solubility of the resultin SODA-ALUM—a property which unfits them fo this purpose. See ALUMINA, AMMONIA DYEING, MORDANTS, POTASSA, SULPHURI ACID, &c. (also *below*).

Ammo''nia Alum. $(NH_4)_2SO_4 . Al_2(SO_4)_3$ 24Aq. *Syn.* (ALUMEN; ALUM; B. P.) ALU'MEN AMMONIA'TUM, L.; ALUN D'AMMONIAQUE, A. AMMONIACAL, Fr. This is a alum in which the sulphate of potassium i replaced by an equivalent of sulphate of ammonium. It is prepared by adding crud sulphate of ammonium to solution of sulphate of aluminum; or gas-liquor, putri urine, &c., to the acid-sulphate.

Much of the common alum, especially tha prepared on the Continent, contains both potassium and ammonium; and recently, enormou works for its manufacture have been establishe in England. As an astringent, and as a souro gray metallic powder (A.D. 1827); and later (1845), under the form of globules exhibiting the leading characteristics of the metal. In 1854, M. Dumas announced to the 'Academy of Sciences,' that M. St. Clair Deville had procured pure aluminum from clay, and exhibited several specimens of considerable size and beauty. The result was a general impression that it might be easily obtained in any quantity, and ultimately at a reasonable price; expectations which have been only partly, though to a great extent, fulfilled, owing to the expense and trouble of the process, notwithstanding recent improvements.

Prep. (M. Deville; A.D. 1854-59.)—A quantity of chloride of aluminum, varying from 200 to 300 grammes (say from 6 to 10 oz.), is introduced into a wide glass or porcelain tube, between two plugs of asbestos to retain it in position, and a current of hydrogen (thoroughly dried by passing first through concentrated sulphuric acid, and then through a tube containing fused chloride of calcium) passed over it; a gentle heat being at the same time applied to the part of the tube containing the chloride, to drive off any free hydrochloric acid which might have been formed by the action of the air upon it. A small porcelain boat, containing sodium, is now introduced at the other extremity of the glass tube, which is then again closed; and when the sodium is fused, the chloride is sufficiently heated to cause its vapour to come into free contact with it. A powerful reaction ensues, with the evolution of much heat, and this continues as long as any undecomposed sodium remains to act on the passing vapour. The mass in the 'boat,' which is now a mixture of the double chloride of aluminum and sodium, in which small globules of the newly reduced metal are suspended, is allowed to cool in the hydrogen; after which it is treated with water, to remove the soluble double chloride. The residuum, consisting of small globules of aluminum, is lastly, reduced to a solid button or mass, by fusion, at a strong heat, under a layer of the fused double chloride of aluminum and sodium.

On a large scale two cast-iron cylinders are employed, instead of the glass or porcelain tube just referred to; the anterior one of which contains the sesquichloride of aluminum, and the posterior one a tray holding the sodium, of which 10 or 12 *lbs.* are commonly operated on at once. These cylinders are united by means of a smaller intermediate one, filled with clean scraps of iron, which serve to separate iron, free hydrochloric acid, and chloride of sulphur, from the vapour of the chloride of aluminum, as it passes through them. During the passage of the vapour of the chloride this smaller cylinder, or tube, is kept heated to from 400° to 600° Fahr.; but the two other cylinders are only very gently heated, since the chloride is volatilised at a comparatively low temperature, and the reaction between it and the fu sodium, when once commenced, usually ge rates sufficient heat for the completion of process.

Occasionally a mixture of the double chlor of aluminum and sodium, 40 parts; chlo of sodium, 20 parts; fluor spar, 20 parts; ea separately dried, powdered, and then blend together; sodium, in small pieces, 7½ to 8 pa are used instead of the last.

It is likewise made from a mixture of kryo and fused chloride of potassium, of each, powder, 5 parts; sodium, 2 parts; a cast-i crucible being employed; the resulting min globules being collected and fused to a b ton under a layer of the double chloride aluminum and sodium.

Prop, &c. Aluminum, when quite p closely approaches silver in appearance, exce in being rather less white and lustrous th that metal. Ordinary specimens, called pu have a slight bluish tint or tin-white colo with a perfect lustre, but far inferior to th of pure silver. Sp. gr. 2·56 (about that glass), which by hammering may be rais to 2·67. It is both ductile and malleable; fuses at a temperature between the melting points of zinc and silver; is not affected b either damp or dry air, or by oxygen at ordinary temperatures, or by water whether cold, or boiling; even steam, at a red heat, is only slowly decomposed by it. It is not acted on by nitric acid, however concentrated, unless boiling, and then very slowly; nor by dilute sulphuric acid, sulphuretted hydrogen, and the sulphurets, or even the fused hydrates of the alkalies. It is, however, readily dissolved by hydrochloric acid, with the evolution of hydrogen, even in the cold; and by a concentrated mixture of nitric and sulphuric acid. It is feebly magnetic, conducts electricity about 8 times better than iron, and is more electro-negative than even zinc. Commercial specimens, owing to the presence of iron and silicon, and often zinc, usually slowly tarnish in damp air, and possess the other properties described above in a somewhat diminished degree.

In a finely divided state, particularly in the state of powder or minute scales in which it was originally obtained, when heated to redness, it catches fire and burns with great rapidity in the air, and in oxygen gas with intense brilliancy, the product in each case being alumina.

Aluminum unites with the other metals, forming ALLOYS, of which some promise to be of great value in the arts. An alloy of 100 parts of aluminum with 5 parts of silver, may be worked like the pure metal, but is harder and susceptible of a finer polish, whilst its property of not being affected by sulphuretted hydrogen and acids remains unimpaired; even 3% of silver is said to be sufficient to impart to it the full brilliance and colour of pure silver. An alloy containing 10% of gold is softer and scarcely so malleable as the pure metal. With

ıe best varieties of iron; and with 20%
e white, and closely resembles silver.
nore than 12% of aluminum the alloy is
but brittle. The alloy formed of 100
of silver with 5 parts of aluminum, is
d as the silver of our coinage, whilst
er properties of the latter metal remain
ed.

. The valuable properties of aluminium
it to numerous applications in the arts
eryday life. Hitherto these have been
mited, owing to its comparatively high
which, notwithstanding it has fallen
rably, is still sufficient to prevent its
l or even extensive application. The
' of the French army have been made
as well as certain articles of jewelry,
c., as brooches, bracelets, chains, spoons,
ther ornamental and useful objects.
to its low sp. gr., it has been used as a
e material for the minute decimal weights
mists, for military helmets, trumpets, &c.
cornet-à-pistons, for which its lightness
noroumess admirably adapt it, have
y been made of it. Its power of resist-
ygen, sulphuretted hydrogen, moisture,
ould render it invaluable as a coating to
particularly iron and lead, to protect
rom rust or corrosion, did not its price
ne. As an internal coating for water-
isterns, &c., no other substance, except
nd platinum, is so well adapted. In
ry, capsules, tubes, &c., either made of
ed with it, may be often advantageously
uted for those of platinum.

ddition to what has been said above, it
observed that, in preparing aluminum,
ef care should be to avoid accidents or

the inferior whiteness and brilliancy of commercial specimens of aluminum; a metal which, in its absolutely pure state, may be reasonably inferred to be as superior in the above respects to silver, as silver is to tin. Commercial aluminum contains from 88 to 94 per cent. only of pure aluminium, and from 1 to 4 per cent. of iron, ½ to 3 per cent. of silicon, and from 1 to 6 per cent. of copper.

Aluminum salts are generally colourless, soluble, and crystallise with difficulty, and are distinguished as follows:—

Tests.—1. Ammonia and the alkaline carbonates throw down a bulky white precipitate (hydrate of aluminum) from solutions of its salts, which is insoluble in excess of the precipitant:—2. Pure potassa and soda throw down white gelatinous precipitates, freely soluble in excess of the precipitant; from which the hydrate of aluminum is reprecipitated by chloride of ammonium, even in the cold:—3. Phosphate of ammonium gives a white precipitate:—4. Iodide of potassium produces a white precipitate, passing into a permanent yellow:—5. Sulphuretted hydrogen gives no precipitate:—6. Sulphydrate of ammonium precipitates alumina from these solutions:—7. Bisulphate of potassium, added to concentrated solutions, gives a precipitate of octahedral crystals of alum:—8. At a red heat its salts part with some of their acid; at a white heat, most of it, if not all:—9. Aluminum compounds, ignited on charcoal before the blowpipe, and afterwards moistened with a solution of protonitrate of cobalt and again strongly ignited, give an unfused mass, which, on cooling, appears blue by day, and violet by candlelight; a test, however, which is inapplicable to fusible compounds of aluminum, being effected by lengthened agitation in a *tub* or other *wooden* vessels, and the *clear liquid*, after repose for a sufficient time, decanted or drawn off from the sediment.

From *alum*, 2 parts; (dissolved in) *warm water*, q. s.; *solution of pyrolignite of lime* (20° Baumé), 3 parts; as before, but allowing a longer time for the subsidence of the precipitate, and taking more care in the decantation, than when acetate of lead is employed.

By decomposing a *solution* of *crude sulphate of alumina* with *neutral* or *monobasic acetate of lead*.

Prop. Its characteristic property is the feeble affinity existing between its acid and base, which, when it is used as a mordant, is counterbalanced by that of the fibres of the cloth or yarn to which it is applied. In other respects, it resembles the other simple salts of alumina.

Uses, &c. In *dyeing* and *calico-printing*, as a mordant. In *medicine*, properly diluted, in chronic diarrhœa; and, mixed with syrup of poppies, in slight cases of hæmoptysis (*spitting of blood*). It has been employed, by M. Gannal, as an injection to preserve animal bodies, which it will do for years.—*Dose.* ½ to 1 dr. daily, in divided portions, taken in thin mucilage or syrup, or in barley-water; as an *injection*, 10 to 20 gr., to water, 4 to 6 fl. oz., in gonorrhœa, leucorrhœa, &c.

Aluminum, Chloride of. Al_2Cl_6. *Syn.* SESQUICHLO″RIDE OF ALUMINUM; ALUMIN′II CHLORI′DI, &c., L. *Prep.* A thick paste made of dry *precipitated alumina*, *lampblack*, and *oil*, is strongly heated in a *covered crucible* until all the organic matter is carbonised. The *residuum* is transferred to a *porcelain tube* fixed across a furnace, one end of which is connected with *another tube* containing *dried chloride of calcium*, and the other end with a *small tubulated receiver*. The porcelain tube is then heated to redness, whilst *chlorine*, dried by passing through the chloride-of-calcium tube, is transmitted through the apparatus. In one or two hours, or as soon as the tube is choked, the whole is allowed to cool, and the newly formed SESQUICHLORIDE collected and preserved in *mineral naphtha* for use.

On the *large scale*:—*Chlorine*, dried as before, is passed over a mixture of *pure clay*, *lampblack*, and *coal-tar*, contained in an *iron retort* similar to that used in the manufacture of coal-gas (*previously* ignited by means of a suitable furnace), and connected with a *cool* chamber accurately lined with *tiles of earthenware*. The vapours of the SESQUICHLORIDE condense in this chamber, as a yellowish crystalline mass, which is collected and preserved as before.

Prop., &c. It is volatile at a dull red heat; excessively greedy of moisture; and very soluble, with decomposition, hydrochloric acid and alumina being formed. Once dissolved, it cannot be again recovered. Its chief use is in the preparation of aluminum.

Obs. Although alumina, like m freely soluble in hydrochloric acid, chloride of aluminum contained in tl cannot be obtained in the *anhydro* even the *solid form*, by its evapo chloride suffering decomposition, formation of hydrochloric acid, wh tilised, and alumina, which is left b

Aluminum, Ni′trate of. Al_2(N NITRATE OF ALUMINA; ALU′MIN L. *Prep.* Similar to that of t and citrate. Its concentrated ac deposits rhombic crystals, containin of water.

Aluminum, Oxide of (Al_2O_3), and ($Al_2(HO)_6$). *Syn.* ALUMINA.

Prep. Aluminum is precipitated from *solutions* of *aluminum salts* c tion of an *alkali* or *alkaline carb* this precipitate, after being thoroug and dried, on ignition loses its wa comes anhydrous. The following formulæ for the purpose:—

Alum is dissolved in about 2 weight of *distilled water*, and the dropped *slowly* into pure *solution* o until the latter is *nearly* but *not* e rated, when the whole is set asid time. The clear supernatant liq decanted, and the *precipitate* is ca thoroughly washed three or four *tepid distilled water;* after whic lected on a filter, again well washed and, lastly, pressed and dried betw *paper*, either without heat, or at a not higher than 120° Fahr. The *pure hydrate of aluminum*, and i into *anhydrous alumina* by exposur heat in a covered crucible. The resi ignition, is pure ANHY′DROUS A SESQUIOX′IDE OF ALUMIN′UM.

A *solution* of *alum* is slowly add *tion* of *carbonate of ammonia*, avoi and the resulting *precipitate*, after b and pressed, is dried at a heat of f 180° Fahr.

Prop., &c. A soft white po hydrate is freely soluble in the s solution of caustic potassa and which it is precipitable by sal when *anhydrous* (as after ignition), acted on by acids, and when per rated, or crystallised, it is wholl but on ignition with alkalies, al MINATES are formed, and the alu readily dissolved by acids, forming are mostly colourless, non-volatile, they have a very astringent an sweetish taste, redden litmus pa their acids by ignition. Its most or rather useful property, is its st for the fibres of organic bodies, as silk, wool, &c., which are capable from its salts; and also for organ matters. Hence its great use in *d* *bleaching liquids* and the *preparat*

e of aluminum agitated or digested
quids containing vegetable colouring
combines with the latter, and either
, or to a great extent, removes it from
tion.

precipitated alumina, dried at a heat
70° and 80°, contains above 58% of
(TOHY'DRATE OF ALUMINA); dried at
r., about 32% of water (TERHY'DRATE
INA).

Aluminum is weighed as oxide, after
The *solubility* of the *moist* or *re-*
cipitated hydrate in solution of am-
able us to SEPARATE it from the
EARTHS which, when present, are
wn with it.

&c. The moist hydrate is used in
cesses in the *arts*. It is the base
blue, the lake-pigments, &c. In
it is employed as an antacid and
in *acidity* of the stomach, *cholera*,
and *dysentery*; in which it is said to
r to the other absorbent remedies.
It has also been highly recom-
the vomiting and diarrhœa of in-
Durr; Neumann; Weese; &c.)—
ildren, 3 to 10 gr.; adults, 5 or 6 to
30 gr., three to six times daily,
in water by mucilage or simple

m, Sil'icate of. $Al_2(SiO_2)_3$. *Syn.*
OF ALUMINA. A substance, which,
us form, is the chief and character-
dient of *common clay*; and which
, in combination, in several other
and abundant minerals.

m, Sul'phate of. $Al_2(SO_4)_3$. *Syn.*
'PHATE OF ALUMINA, NEUTRAL S.
LU'MINÆ SUL'PHAS, A. SESQUI-
L. *Prep.* 1. Saturate *dilute sul-*
with *hydrate of aluminum*, gently
and crystallise.

e, commercial.) By mixing *clay*
vitriol, in the way described under
e product is the 'CONCENTRATED
he dyers.

Its crystals are needles and thin
tes; soluble in 2 parts of water;
gent, and somewhat sweetish; re-
l; a full red heat expels its acid,
esiduum of pure alumina; with the
of potassium, sodium, and ammo-
ms alum.

. In the *arts*, chiefly as a substi-
un; the sulphate of potasium in the
g found to be an unnecessary and
dient, only useful to purify the salt
by forming a compound of easy
ion; an object that may be ef-
greater certainty by cheaper me-
medicine, as a wash for foul and
ed ulcers; and as an astringent
tic injection. M. Gannal has suc-
ployed a solution of this salt to
imal bodies, by throwing it into
. Even an *enema* of 1 quart of it, or an *injection* of a like quantity into the œsophagus, will suffice to preserve a body for several weeks. The mineral called AL'UNITE or ALU'MINITE, found near Newhaven (Sussex), is a native *subsulphate* or *basic sulphate* (DISUL'PHATE) *of alumina*.

Aluminum, Sulphide of. Al_2S_3. *Syn.* SUL'PHIDE OF ALUMINIUM, &c. A substance best obtained by passing the *vapour* of *bisulphide* of *carbon* over *pure alumina*, at a bright red heat. It is instantly decomposed by water, with the evolution of sulphuretted hydrogen. See ALUMINIUM (*above*).

Aluminum Tann'ate. *Syn.* TANNATE OF ALUMINA, Eng.; ALU'MINÆ TANN'AS, L. *Prep.* Take of *pure hydrate of aluminum* (dried at 90° Fahr.), 1 part; *tannic acid* (dried at 212°), 2 parts; triturate them together for some time, adding just sufficient water to bring them to the consistence of a syrup, and carefully evaporate to dryness at a heat not higher than 120° Fahr.; lastly, reduce the residuum to powder.

Uses, &c. A combination of uncertain constitution, which is said to have been found very useful in obstinate vomiting and diarrhœa, in dysentery, and particularly in hæmoptysis, hæmorrhage, &c.—*Dose*, 3 to 12 or 15 gr.

AL'VINE (-vĭn). *Syn.* ALVI'NUS, L.; ALVIN, Fr. Of or from the belly or intestines; relating to the intestinal secretions.

AM'ADOU (-ăh-dōō). *Syn.* GERMAN TINDER, TOUCH'WOOD, PYROTECH'NIC SPONGE, SPUNK‡§, SURGEON'S AG'ARIC, A. OF THE OAK, &c.; AGAR'ICUS QUER'CÛS, A. QUER'NUS, A. CHIRURGO"RUM, FUN'GUS QUERCÛS, &c., L.; AMADOU, AGARIC AMADOUVIER, Fr.; ZUNDERSCHWAMM, Ger. A soft, spongy, combustible substance, being the prepared flesh of *bole'tus fomenta"rius* (Linn.), an indigenous species of fungus found on the *oak*, *birch*, and a few other trees (REAL AMADOU or OAK-AGARIC); for which *b. ignia"rius* (Linn.), a like fungus, found on the willow, cherry, plum, and other trees, is frequently substituted.

Collec., Prep., &c. The outer bark of the *fungus* (collected in Aug. or Sept.) having been removed with a knife, the inner *spongy substance* is carefully separated from the woody portion lying below, and after being cut into slices, is well beaten with a mallet until sufficiently soft and pliable. Sometimes it is first boiled in *water*, in order to separate the epidermis and porous parts, and to free it from soluble matter; after which it is beaten as before. In this state it is used in *surgery*, &c. To *complete* its *manufacture* for TINDER, it is soaked once, or oftener, in a *strong solution of saltpetre* (RED AMADOU; BROWN A.); or in a thin paste made of *gunpowder* and *water*, which is thoroughly forced into the pores (BLACK A.); after which it is dried, and well rubbed to free it from loose matter. The *first* is the more cleanly; the *last*, the more combustible.

Uses, &c. A light brown or reddish-brown substance. In *surgery*, *pharmacy*, &c., it is used to stop *local bleeding*, to spread *plasters* on, as a *compress*, and for other like purposes. When covered with *resin-plaster*, it forms an excellent article for the *protection* of *abraded surfaces*. A small piece thus prepared, of a circular shape, having a round hole cut in the middle, the size of the apex of the corn, is one of the very best *corn-plasters* known; as from its great softness it at once protects the part from pressure, and removes the cause. As a material for *shoe-socks* it is superior to *all* other substances. The amadou for surgical purposes must *not* contain nitre.

AMAL'GAM. [Eng., Ger.] *Syn.* AMAL'GAMA, L.; AMALGAME, Fr. In *chemistry* and *metallurgy*, an alloy containing quicksilver; more particularly one in which that metal plays a conspicuous part. Medallists improperly apply this term to all soft alloys.

Mercury unites with many of the metals by mere contact; and with some of them, as *gold*, *silver*, *tin*, and *lead*, in certain proportions, without losing its fluidity. In a few cases, as with *potassium*, this union is attended with considerable violence, and with the production of light and heat.

Prep. Most of these compounds may be formed by agitating or rubbing the *mercury* with the other *metal*, or *metals*, in the state of *filings* or *small fragments*, either with or without heat; or with the *easily fusible metals*, by adding it to them in the melted state; care being taken, in both cases, that the heat be not sufficient to volatilise the mercury.

Prop., Uses, &c. Some amalgams are *solid*, and not unfrequently crystalline; others are *fluid*. Of the latter, several crystallise after a time, becoming solid; being, probably, merely solutions of the solid amalgams in excess of mercury. The *amalgams* of *gold*, *silver*, *tin*, *zinc*, &c., are extensively employed in *gilding*, *silvering*, *and dentistry*, and in other useful arts and manufactures.

Ammoni'acal Amalgam. An unstable compound produced when a *globule of mercury* is placed in a small cavity formed in a piece of *sal ammoniac*, and the *negative pole* of a *powerful galvanic battery* is brought into contact with the metal, and the *positive pole*, with the ammoniacal salt. In a few seconds the new compound (*amalgam*) of the consistence of butter is formed. On withdrawing the influence of the battery, the whole returns to its former condition. By putting an *amalgam of sodium* into the *moistened cavity of the sal ammoniac*, similar results are obtained. The phenomena attending the formation of this new substance have been urged as evidence of the existence of the theoretical basic radicle AMMONIUM.

Elec'trical Amalgam. *Prep.* 1. Take of *zinc* and *grain-tin*, of each, 1 *oz.*; melt them in an iron ladle, remove it from the fire, and add of *mercury* (hot), 3 *oz.*; stir the whole well together with an *iron rod*, pour it i
well-chalked wooden box, and agitate it vi
until cold; or, instead of this, it may be b
stirred until cold, and then powdered.
should be preserved in a corked glass bot

2. (La Baumé.) *Zinc*, 2 *oz.*; *grain-tin*,
bees' wax, ½ *oz.*; melt, add of *mercury*,
and otherwise proceed as before. Pref
by some to all other mixtures.

3. *Zinc*, 2 *oz.*; *mercury*, 5 *oz.*

Use. To cover the *cushions* of *elec*
machines. A little of the *powder* is pour
a piece of paper, crushed smooth with
knife, and then spread thinly on the surf
the cushion or rubber, previously sl
smeared with tallow; or the *powder* m
rubbed down with a *little tallow*, prior t
application of it.

Gild'ing Amalgam. *Syn.* AMALGAM OF
Prep. Take of *grain-gold*, 1 part; *me*
8 parts; put them into a small iron sau
or ladle, and apply a *gentle* heat, us
smooth piece of iron as a stirrer; whe
solution or combination is complete, p
out on a clean plate or smooth stone slab

Use. To gild brass, copper, &c., in the
mon process of *wash* or *fire-gilding* (whic
A less proportion of gold, than the ab
used when a thin and cheap gilding is req
as by increasing the quantity of the me
the same weight of the precious metal
extended over a much larger surface.

Sil'vering Amalgam.—*a.* For METALS.
AMALGAM OF SILVER. *Prep., Uses, &c.*
last, but substituting silver for gold.

b. For GLASS. *Prep.*—1. *Lead*, ti
bismuth, of each, 1 *oz.*; *bees' wax* or *resin*,
melt, skim off the dross, cool to the
point at which the mixture will remain
and add of *quicksilver*, 10 *oz.*; mix wel
an iron rod.

2. *Lead* and *tin*, of each, 1 *oz.*; *bi*
2 *oz.*; *quicksilver*, 4 *oz.*; as the last.

Uses, &c. For silvering the insides of
glass vessels, globes, convex mirrors, &c.
glass being thoroughly cleaned and dr
carefully warmed, and the *amalgam*, re
fluid by a gentle heat, is poured in, a
vessel turned round and round, so as to
the metal into contact with every part w
is desired to cover. At a certain temp
it will be found to readily adhere to the
The excess is then poured out, and the
set aside to cool.

Tooth Amalgams. See DENTISTR
TOOTH-CEMENTS.

Var'nisher's Amalgam. *Prep.* Melt
tin, 4 *oz.*, with *bismuth*, 1 *oz.*; add *quic*
1 *oz.*, and stir till cold; then grind it ve
with *white-of-egg* or with *varnish*, and
the mixture to the figure or surface with
brush. It is *used* in several of the orna
trades.

AMAL'GAMATED. *Syn.* AMALGAM
L.; AMALGAMÉ, Fr. Compounded or b
with quicksilver; formed into an amalg

considerably from electrical excitement. Amber is JOINED and MENDED by smearing the surface of the pieces with *linseed* or *boiled oil*, and then *strongly* pressing them together, at the same time holding them over a *charcoal fire*, or heating them in any other convenient way in which they will not be exposed to injury. The *commoner varieties* are HARDENED and rendered CLEARER, either by boiling them in *rape oil* for about 24 hours, or by surrounding the pieces with *clean sand* in an iron pot, and exposing them to a gradually increasing heat for 30 or 40 hours. During this process small fragments are kept in the sand at the side of the pot, for the purpose of occasional examination, lest the heat be raised too high, or be too long continued.

Prop., &c. Hard; brittle; tasteless; glossy; generally translucent, but sometimes opaque, and occasionally, though rarely, transparent; colour, generally yellow or orange, but sometimes yellowish-white; becomes negatively electric by friction; smells agreeably when rubbed or heated; fracture, conchoidal and vitreous or resinous; soluble in the pure alkalies, and, without decomposition, in oil of vitriol, which then becomes purple; insoluble in the essential and fixed oils without long digestion and heat; soluble in chloroform; melts at about 550° Fahr.; burns with a yellow flame, emitting at the same time a peculiar fragrant odour, and leaving a light and shiny coal. By dry distillation it yields *inflammable gases*, a small quantity of *water*, a little *acetic acid*, a *volatile oil* (OIL OF AMBER; O′LEUM SUC′CINI, L.) at first pale, afterwards brown, thick, and empyreumatic, and an *acid* (SUCCIN′IC ACID; ACIDUM SUCCIN′ICUM, L.); with *residual charcoal* 12 to 13%. Sp. gr. 1·065 to 1·09, but usually about 1·070. It cannot be fused without undergoing more or less chemical change.

Ident. Amber may be known from *mellite* and *copal*, both of which articles are occasionally substituted for it, by the following characteristics:—1. MELLITE is *infusible* by heat, and burns *white*:—2. A piece of COPAL, heated on the point of a knife, *catches fire*, and runs into *drops*, which *flatten* as they fall:—3. AMBER burns with *spitting* and *frothing*, and when its liquefied particles drop, they *rebound* from the plane on which they fall (M. Haüy):—4. Neither *mellite* nor *copal* yield succinic acid by distillation; nor the agreeable odour of amber when burnt; nor do they become so readily electric by friction.

Uses. It is chiefly made into mouth-pieces for pipes, beads for necklaces, and other ornaments and trinkets. It is also used as the basis of several excellent varnishes. In *medicine*, it was formerly given in chronic coughs, hysteria, &c.—*Dose* (of the powder), 10 to 60 gr.

Remarks. The finer sorts of amber fetch very high prices. A piece 1 *lb.* in weight is said to be worth from 10*l.* to 15*l.* 5000 dollars a few years since were offered in Prussia for a piece weighing 13 *lbs.*, and it was stated by the Armenian mer would fetch from 30,000 to 40,000 dol Constantinople. It is more valued in th than in England; and chiefly on acco the Turks and other Orientals believing be incapable of transmitting infection. royal cabinet, Berlin, there is a piece we 18 *lbs.*, supposed to be the largest ever The *coarser kinds* alone are emplo medicine, chemistry, &c.

Ac′id of Amber* (ăs′-). Succinic Aci

Bal′sam of Amber. *Syn.* BAL′SAMU CINI, L. The *thick matter* left in the after the rectification of *oil of amber* which it resembles in its properties.

Facti″tious Amber (-tĭsh′-). *Syn.* SUC FACTI″TIUM, L. Mellite, copal, and have each been substituted for amb pecially for small fragments of it. B an imitation has been produced by act *gutta percha* with *sulphur*, at a *high tempe* which, either alone, or in combinatio *copal*, is said to have been extensively off for genuine amber.

Liq′uid Amber†. See LIQUID-AMBA

Oil of Amber. See OILS.

Re′sin of Amber. See PYRÉTINE.

Salt of Amber. Succinic Acid.

Sol′uble Amber. *Prep.* Fragments o are cautiously heated in an *iron pot*, soon as it becomes semi-liquid, an equal of pale *boiled linseed-oil*, previously m is *very gradually* stirred in, and the thoroughly blended. — *Used* as a cem glass and earthenware, and thinned wit *turpentine* to make varnishes. It wi any length of time if preserved from th

AMBER-CAMPHOR. See PYRÉTIN talline).

AM′BER DRINK†. Amber-colour liquor.

AM′BER-SEED. Musk-seed (which

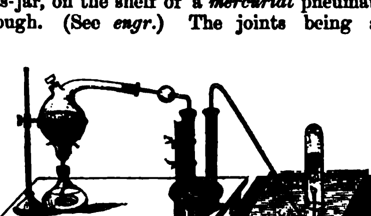
AM′BER-TREE. The popular nam species of *anthospermum*, an evergreen of which the *leaves*, when bruised, agreeable odour.

AM′BERGRIS (-grĭs; -grēse ‡). *Syn* AMBER*; AMBRAGRI″SEA (grĭzh′-e- AMBREGRIS, Fr.; AMBRA, AMBAR, G odorous, solid substance, found floating sea in tropical climates, and in the ca the *cachalot* or *spermaceti-whale* (macrocephalus). It has been suppo some, to be a morbid secretion of the intestines, analogous to biliary calcu according to Mr. Beale, it consists of t indurated fæces of the animal, perh suggested by Brande and Pereira), so altered by disease. "Some of the s fæces, dried with the proper precautio all the properties of ambergris." (Bea is occasionally found in masses weighin 60 to 225 *lbs.*

Prop., &c. Solid, opaque, ash-c streaked or variegated, fatty, inflam been sought out and occasionally adopted for the preparation of the principal salts of ammonia (its *sulphate*, *carbonate*, and *hydrochlorate*); some of which have been patented, but few of them have got into general use, or have been carried out on the large scale. For many years the manufacture of ammonia and its compounds has incessantly engaged the attention of European chemists.

Ammonia, in a state of combination, is found, in variable quantities, among the saline product of volcanoes, in sea and rain water, in bituminous coal, in urine, in guano, and in the atmosphere, especially that of large towns. The minute stellated crystals sometimes found on dirty windows in London, and other populous cities, consist of sulphate of ammonia. (Brande; Fownes; Letheby.) In the *free state* it exists in the juices of some plants, and in the living blood of animals, and it is freely developed during the decomposition of azotised vegetable substances, and during the putrefaction of animal matter.

Prep. A mixture of *fresh hydrate of lime* with an equal weight of *sal ammoniac* (both dry and in fine powder), is introduced into a glass flask or retort, the beak of which communicates with one end of a U-shaped tube filled with small fragments of *recently burnt quick-lime*, and from which extends another glass tube, about 18 inches long, having its further end bent up ready to be placed under a gas-jar, on the shelf of a *mercurial* pneumatic trough. (See *engr.*) The joints being all made air-tight by collars of *India rubber*, heat is applied by means of a spirit-lamp, and as soon as the air contained in the apparatus is expelled, the gas is collected for use. It cannot be dried by means of *chloride of calcium.* Powdered *quick-lime* may be substituted for the hydrate in the above process; in which case the *evolved gas* is *anhydrous*, but a much greater heat is then required for its liberation.



Comp. Ammonia is a compound of 3 *volumes* of *hydrogen*, and 1 *vol.* of *nitrogen*, condensed into two volumes; and by *weight* of 82·35 parts of nitrogen, 17·65 parts of hydrogen, or, in other words, of one atomic weight of nitrogen and three of hydrogen, having the formula NH_3.

Prop. Gaseous, colourless, invisible; highly pungent, acrid, irritating and alkaline; irrespirable, unless very largely diluted with air;
extinguishes combustion; burns slowly in
gen; sp. gr. 0·589; 100 cub. inches w
18·26 gr. Under a pressure of 6·5 a
spheres, at 50° Fahr., it forms a transp
colourless liquid of the sp. gr. 0·731; an
Fahr. this liquid expanded into 1009 t
its volume of ammoniacal gas; at —40° F
and the ordinary atmospheric pressure
forms a subtle colourless liquid, which
—103° Fahr. freezes into a white, translu
crystalline substance. (Faraday.) It is hi
basic; all its salts are either volatilised
decomposed at, or under, a red heat—th
with a *volatile* acid sublime unchanged—th
with a *fixed* acid lose their ammonia. It
decomposed into its elements by transmis
through a red-hot tube; and when in cont
with metallic oxides or spongy platinum, at t
same temperature, the newly evolved hyd
gen unites with the oxygen of the oxide or
the atmosphere, forming water. Water at
Fahr. absorbs 670 times its volume of this g
and the solution has the sp. gr. 0·875.
concentrated aqueous solution boils at 1
and freezes at —40° Fahr.

Tests, &c. Ammonia is recognised by
Its pungent odour:—2. By turning veget
blues *green*, and vegetable yellows *brown*;
which soon regain their *previous colours*,
pecially on the application of heat:—3.
producing *dense white fumes* when brought
contact with those of hydrochloric acid.

Phys. eff., &c. Inhaled, *undiluted* with
it is an irritant poison, producing spasms
the glottis, convulsions, and death; even w
diluted, it acts as a powerful acrid, and l
irritant; applied to the skin it causes ves
tion. The use of the pungent odour of c
mon 'smelling salts,' in *syncope*, *headache*,
is well known. *Largely diluted* with air
has been recently highly extolled in *chr*
hoarseness, *asthma*, &c.; and as an *antidot*
the fumes of *bromine*, *chlorine*, and *hydrocy*
acid. (Smee.)

Ant., &c. The vapour of *acetic acid* or c
mon *vinegar*, freely inhaled. It may be
duced by sprinkling a little on a piece of
iron, as a heated shovel. If bronchial infl
mation follows, it must be treated by pur
tives and a low diet; and, if severe, and
patient be plethoric or robust, by venesect
or cupping.

Uses. Ammonia is employed in numer
processes in *chemistry* and the *arts*; but chi
in the form of 'liquor of ammonia,' 'spirit
hartshorn,' &c., and in combination, under
form of salts. In its *pure* or *gaseous stat*
possesses little practical interest.

Ammonia, Solution of. *Syn.* SOLUTION
AMMONIA, LIQUOR AMMONIÆ, AMMONIUM
DRATE, AMMONIA, Eng.; AMMONIAQUE
QUIDE, DISSOLUTION D'AMMONIAQUE, ESP
DE SAL AMMONIAC, Fr.; ATZENDER AMMONI
LIQUOR, SALMIAK-GEIST, Ger.; LIQUORE
AMMONIACO, Ital. Ammonia gas readily
solves in water, one volume of water absorb

gr. of ·875, and contains about 39 per cent. of ammonia, but the usual strong ammonia of commerce has a sp. gr. of but ·88. The liquor ammonia fortior, B. P., has a sp. gr. of about ·893, and contains 32·5 per cent. of ammonia, while the *liquor ammoniæ* B. P. has a sp. gr. of about ·940, and contains about 10 per cent. of ammonia. As a *medicine*, it is antacid, diaphoretic, rubefacient, stimulant, and counter-irritant; and is used in various affections in which these remedies are indicated. As a *vesicant* it is superior to cantharides, and as a *caustic* it is used with advantage in the bites of rabid animals, especially those of serpents and insects. Its *vapour* is a common nasal stimulant in faintings, epilepsy, &c. In its *concentrated form* it is a *corrosive poison.*—*Dose.* 5 to 25 drops, in cold water, or milk and water. It enters into the composition of several valuable external remedies, and is in constant employment in the *chemical laboratory*, both as a reagent, and for the preparation of other compounds.

Ant., &c. When the *fumes* have been inhaled, the patient should be exposed to a current of fresh air; and when the *liquid* has been swallowed, *vinegar* or *lemon-juice* mixed with water, may be administered; followed by an emetic, or, on its failure, by the stomach-pump.

Estim. The quantity of gaseous ammonia in *pure* water of ammonia is easily determined from the specific gravity of the liquid, or from its saturating power. When *impure* or mixed with other substances, a *given weight of the sample* is placed in a small retort, the end of which is made to dip into a vessel containing *dilute hydrochloric acid.* A strong *solution of caustic potassa* is then poured into the retort, and heat applied by means of a *small spirit lamp.* When *all* the ammonia is distilled over, the acid solution is evaporated to dryness, by the heat of a *water bath*, and the residuum (*chloride of ammonium*) weighed. *Each grain* of the *chloride* thus found, represents ·31804 gr. of pure AMMONIA; 53·5 parts of the *former* being equivalent to 17 of the latter. If the article for examination be a solid substance (as a salt), it may be dissolved in *water*, or in *dilute acid*, before being put into the retort.

In accurate experiments, in the laboratory, *ammonia* is usually WEIGHED either as *chloride of ammonium* (see *above*), or as *ammonio-bichloride of platinum* ($NH_4Cl, PtCl_2$); *every gr.* of the *latter* representing ·07614 gr. of pure AMMONIA. Sometimes, though rarely, the quantity of ammonia is determined from the *volume* of *nitrogen* eliminated from it, of which 14 gr. represent 17 gr. of AMMONIA.

Concluding remarks, Patents, &c. Whatever form or process may be adopted for the preparation of liquid ammonia, it is absolutely necessary to keep the receivers as cool as possible, by means of snow, ice, or a current of very cold water, for the purpose of promoting the absorption of the gas, and to prevent its loss. On the *small scale*, the glass
bottles may be most conveniently
with ice, or a freezing mixture,
more of them, should be furnished
tubes, to prevent accidents. On
scale, a capacious oblong retort, usu
(but sometimes, though seldom, of *l*
large opening or tubulature conven
ated for inserting the 'charges,' and
ing the residuum of the distillat
ployed. The tubulature, or openin
by means of a large and accurat
iron stopper, or with a door secured
as the case may be. The stop
greased befo[illegible]ertion, and is
means of a p[illegible]ful lever. Should
so firmly fixed that it cannot be d
the usual manner, a *cloth* moist
cold water, and carefully wrapped
without touching the neck of the
generally cause it to contract su
enable the operator to remove it w
Sometimes a large iron kettle, w
able and accurately fitting lid sec
place like that of a 'Papin's dig
having a large and long tubula
centre, is employed instead of a
which it has the advantage of
larger opening for the removal of
duum of the process. In either ca
tillatory vessel is imbedded in san
by fire-brick, and is not exposed
the heat of the furnace. Before c
the distillation the joints are all *w*
avoid leakage. An *excellent plan*
the gas, as it leaves the retort,
silver or *pewter* 'worm' or 'refrig
in a tub supplied with a stream o
water; by which it will be sufficie
before it reaches the 'receivers' to
necessity of any further attention
than keeping the cloths wrapped r
constantly moistened with *cold wa*
lower end of the 'worm' should be
by means of a balloon-shaped 'adc
the 'still,' and the *upper* end wit
'receiver;' the use of the balloon
intercept any volatilised ammoni
might be accidentally driven over b
being too high, or too suddenly rais

The heat should be *gradually* a
very gradually raised, to prevent
sal ammoniac or sulphate being
undecomposed; and even towards the
process it should not even approach

The *lime* is best 'slaked' and 'pa
about 4 parts of *water;* as a low
then required to expel the gas, and
over more easily and fully, than
water is employed. This is absolut
sary when the sulphate is the am
used; as otherwise the residuum of
of lime' would become so hard th
not be easily removed from the retor

The *gas* being *wholly* expelled
retort, or other distillatory vessel,

solutions in commerce is known as ammonimetry, and depends on the sp. gr., for although the *per-centage richness* of *solutions of ammonia*, or of its *carbonates*, may be determined, with the greatest accuracy, by the methods of ALKALIMETRY, already described; for all the ordinary purposes of *commerce*, and of the *laboratory*, the strength of *pure solutions* of *ammonia* may be infer with sufficient correctness, from their densi and to this the term AMMONIOMETRY is usu restricted.

The *sp. gr.* of the *sample* being found eit by the *hydrometer*[1] or *sp. gr. bottle*, in usual manner, its *per-centage strength* may seen by inspection of the following *Table*:—

TABLE *exhibiting the relations between the* SPECIFIC GRAVITY *of Solution of Ammonia* and PER-CENTAGE STRENGTH, *for every variation of* ·00125 *Sp. Gr., from* ·87500 *to* 1·00000, 62° Fahr. Abridged from the larger *Table* of Mr. J. J. GRIFFIN.

Sp. Gr. of the Liquid Ammonia.	Pure Ammonia per cent., by Weight.	Sp. Gr. of the Liquid Ammonia.	Pure Ammonia per cent., by Weight.	Sp. Gr. of the Liquid Ammonia.	Pure Ammonia per cent., by Weight.
·87500	34·694	·91750	21·837	·96000	10·119
·87625	34·298	·91875	21·477	·96125	9·790
·87750	33·903	·92000	21·118	·96250	9·462
·87875	33·509	·92125	20·760	·96375	9·135
·88000	33·117	·92250	20·403	·96500	8·808
·88125	32·725	·92375	20·046	·96625	8·483
·88250	32·335	·92500	19·691	·96750	8·158
·88375	31·946	·92625	19·337	·96875	7·834
·88500	31·558	·92750	18·983	·97000	7·511
·88625	31·172	·92875	18·631	·97125	7·189
·88750	30·785	·93000	18·280	·97250	6·867
·88875	30·400	·93125	17·929	·97375	6·547
·89000	30·016	·93250	17·579	·97500	6·227
·89125	29·633	·93375	17·231	·97625	5·908
·89250	29·252	·93500	16·883	·97750	5·590
·89375	28·871	·93625	16·536	·97875	5·273
·89500	28·492	·93750	16·190	·98000	4·956
·89625	28·133	·93875	15·846	·98125	4·641
·89750	27·736	·94000	15·502	·98250	4·326
·89875	27·359	·94125	15·158	·98375	4·011
·90000	26·984	·94250	14·816	·98500	3·698
·90125	26·610	·94375	14·475	·98625	3·386
·90250	26·237	·94500	14·135	·98750	3·074
·90375	25·865	·94625	13·795	·98875	2·763
·90500	25·493	·94750	13·456	·99000	2·453
·90625	25·123	·94875	13·119	·99125	2·144
·90750	24·754	·95000	12·782	·99250	1·835
·90875	24·386	·95125	12·446	·99375	1·527
·91000	24·019	·95250	12·111	·99500	1·220
·91125	23·653	·95375	11·777	·99625	·914
·91250	23·288	·95500	11·444	·99760	·609
·91375	22·924	·95625	11·111	·99875	·304
·91500	22·561	·95750	10·780	1·00000	{ 0 or *Water*.
·91625	22·198	·95875	10·449		

⁂ The *specific gravity* of *mixtures* of *pure solution of ammonia* and *pure water* is preci the mean of the specific gravities of their constituents. (Davy; Dalton; Christis In all *solutions* of *ammonia*, a quantity of *anhydrous ammonia*, weighing 212¼ gr., displ exactly 300 gr. of *water*, and reduces the *sp. gr.* of the liquid to the extent of ·001 (Griffin.) The *strongest solution* of *ammonia* which it is possible to prepare at 62° F has the sp. gr. ·87500, and contains 34·694% of pure ammonia, by weight, or 21,251 gr. gallon. (Griffin.)[2]

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[1] An hydrometer specially *weighted* and *graduated* for this purpose, is called an AMMONIM′ETER, AMMONIOM′ETER, or AMMO″NIA-ME′TER (AMMONIM′ETRUM, AMMONIOM′ETRUM, &c., L.).

[2] Mr. Griffin, in his '*System of Ammonimetry*,' calls every 212¼ gr. of *anhydrous ammonia* a TEST-ATOM; every 7 water-gr. measure, a SEPTEM. Thus, a gallo water (= 10 *lbs.*) contains 10,000 septems. The degre his AMMONIA-METER range from 1 to 100, and indicat number of *test-atoms* of *ammonia* in one *gal.* of the li

, Carbonates of. (B. P.) *Syn.* AM-
BONAS. See AMMONIUM, SESQUI-
OF.
.UM. The name given to a group
which play the part of a com-
, radical, or metallic element. This
whose formula is NH_4 or $(NH_4)_2$,
een isolated, although capable of
st stable salts with the various acid
everal attempts have been made,
obtain this compound radical, or
ements, in a free state, and with
a success, but on account of its
ility it invariably decomposes when
ammonia and hydrogen.
m salts are some of the most im-
mical agents, and are usually re-
follows, ammonia solution, however,
g in exactly the same manner as
of ammonium hydrate:—By im-
p blue tint to solutions of salts of
; *exhalation* of *ammoniacal gas*
by its odour), when triturated or
heated with caustic potassa, soda,
lded to a solution of bichloride of
ey produce a *heavy yellow, crys-*
pitate, consisting of *minute octa-*
y discernible under the microscope.
itrate of mercury, a *black* precipi-
bichloride of mercury, a *heavy*,
itate. With a concentrated solu-
aric acid, a *crystalline, white* pre-
rly similar to that given with salts
They are nearly all *soluble* in
ile, and *crystallisable*.
e carbonate, they are almost in-
mated by conversion into ammonia,
ion by volumetric analyses, as in
In the laboratory, however, for
ses, they are converted into the
ride of ammonium and platinum.
m Salts:—
m, Acetate of. $NH_4C_2H_3O_2$. *Syn.*
ACE'TAS, L.; ACETATE D'AMMO-
., ; ESSIGSÄURES AMMONIAK, Ger.
ake of *acetate of lime* or of *potassa*
moniac, equal parts; mix and distil
heat. The oily liquid (BINACETATE
IUM, $HNH_4(C_2H_3O_2)_2$), in the re-
as a radiated crystalline mass on
Dry *gaseous ammonia* passed into
nelted by a gentle heat, transforms
e solid and inodorous *neutral ace-*
$_2H_3O_2$.
g acetic acid is saturated with *am-*
rbonate of ammonium, and the solu-
rated over *sulphuric acid* in vacuo;
ng crystals, after being carefully
e dried by pressure between bibulous

r. Long, slender crystals, or a
mass, freely soluble in both alcohol
and deliquescent in the air; taste,
cooling, and somewhat sweetish.
ns cannot be evaporated without
mmonia; even the salt passes off in
large quantities with the vapour of water. Its aqueous solution becomes alkaline on keeping, from decomposition of the acid. Distilled with *anhydrous phosphoric acid*, it is converted into ACETONITRILE. An aqueous solution of this salt was introduced into the Materia Medica by Boerhaave, and has since been extensively used as a *diaphoretic* and *febrifuge*, under the popular name of MINDERE'RUS SPIRIT, after Minderer or Mindererus, who extensively employed it and extolled its virtues. When *pure*, both the salt and its solutions are *neutral* to test-paper, and are *wholly volatilised* by heat. See LIQUOR AMMONIÆ ACETATIS.

Ammonium, Arseniate of. $(NH_4)_3AsO_4$. *Syn.* AMMONIÆ ARSE'NIAS, L. *Prep.* 1. (NEUTRAL.) Saturate a warm *concentrated solution* of *arsenic acid* with *carbonate of ammonium* in *slight* excess; evaporate by a gentle heat, that crystals may form on cooling.

2. **Ammonium, Binarseniate of.** $H(NH_4)_2AsO_4$. As above, but adding an additional equiv. of the *acid*, as soon as any *excess* of ammonia has been expelled by the heat employed to evaporate the solution.—*Dose* (of either). 1-24th to 1-12th gr.; in phthisis, certain skin diseases, &c. See SOLUTIONS (and *below*).

Ammonium, Arsenite of. NH_4AsO_2. *Syn.* AMMONIÆ AR'SENIS, L. *Prep.* From a *hot concentrated solution* of *arsenious acid*, and *sesquicarbonate of ammonium*, as the last.—*Used* (chiefly) to make arsenite of iron. The properties and physiological effects of the above arsenical preparations are for the most part similar to those of arseniate and arsenite of potassa. They are all *poisonous*.

Ammonium, Benzoate of. *Prep.* 1. Dissolve benzoic acid in ammonia solution to saturation, then further add *ammonia* in *slight excess*, and crystallise by refrigeration, or in vacuo.

2. (LIQUID; SOLU'TIO AMMONIÆ BENZOA'TIS, L.) As the last, but without evaporating the solution.

Prop., &c. Very soluble and very difficult to crystallise. If the solution is boiled for a short time and then abandoned to spontaneous evaporation, crystals of ACID BENZOATE OF AMMONIUM are deposited. It is *used* chiefly as a chemical test; but has been recently recommended in chronic bronchitis, old coughs, &c.; and to check the formation of chalk-stones and urinary calculi.—*Dose.* 10 to 15 gr.; (of the *solution*) 15 drops to 1 fl. dr., or more. See BENZOIC ACID.

Ammonium, Bromide of. NH_4Br. *Syn.* AMMO''NII BROMI'DUM, A. BRO'MIS, L.; HYDROBROMATE D'AMMONIAQUE, BROMURE D'AMMONIUM, Fr. A salt which is obtained from *hydrobromic acid, bromide of iron*, &c., by similar processes to those adopted for the iodide. It forms white prismatic crystals; and, in its general properties, resembles bromide of potassium. It is volatile, and easily decomposed.

Used as a nervine in hysterics; especially useful for sleeplessness where there is no organic disease; given in epilepsy when bromide of potasium fails.—*Dose.* 2 to 20 grains.

Ammonium, Carbonates of:—

Ammonium, Carbonate of. *Syn.* NEUTRAL CARBONATE OF AMMONIUM. Equal parts of dry sal ammoniac and sodium carbonate are heated to form the neutral ammonium carbonate of commerce, which sublimes. Solid crystalline substance, with a strong ammonical odour, volatile and soluble.

Uses, &c. In the solid form, it is not now used in medicine; but it is indirectly employed in several liquid preparations in which the sesquicarbonate is ordered. It is superior to any other preparation of ammonia for filling smelling bottles; as it is not only more pungent, but does not lose its pungency by keeping. It volatilises more quickly than the sesquicarbonate, and the residuum, unlike that of the latter salt, continues as odorous as ever. It is the basis of several of the most popular and esteemed advertised *smelling salts* of the shops. *Spirit of hartshorn* is an impure solution of this salt, originally obtained by distilling hartshorn or bones.

Ammonium, Sesquicarbonate of. Probably $2NH_4HCO_3 + NH_4NH_2CO_2$, *i.e.* a mixture or compound of bicarbonate of ammonium and carbonate of ammonium. *Syn.* (CARBONATE OF AMMONIA, AMMONIÆ CARBONAS. B. P.). CARBONATE D'AMMONIAQUE, Fr.; KOHLENSAURES AMMONIAK, Ger. It is prepared on a very large scale commercially as follows:—*Sal ammoniac* or *sulphate of ammonia*, and *chalk*, equal parts, both dry and in powder, are mixed as before, and sublimed from a series of *iron retorts* or *iron pots*, into a *well-cooled* and *capacious receiver* lined with *lead* or *earthenware;* or, more generally, into such a receiver connected, by *iron* or *lead* pipes, with a second and similar one containing a *stratum of water*, to absorb the *free ammonia* evolved during the process.

Prop. The carbonate of ammonia, of *commerce*, usually occurs in the form of white, fibrous, translucent, or semi-translucent cakes, generally about two inches thick. It is less volatile and pungent than the neutral carbonate; soluble in 4 parts of water at 55° Fahr., 3·3 parts at 62°, 2·5 parts at 96°, and 2 parts at 120°; boiling water and alcohol decompose it, with the evolution of carbonic acid gas and ammonia; by age or exposure to air, the surface assumes an opaque white colour, from its carbonate flying off, and the remaining bicarbonate being less volatile. Unlike the carbonate, it can neither be resublimed, nor digested or distilled with either alcohol or water, without suffering decomposition. Sp. gr. 0·966.

The exact composition of this salt varies, according to its method of preparation.

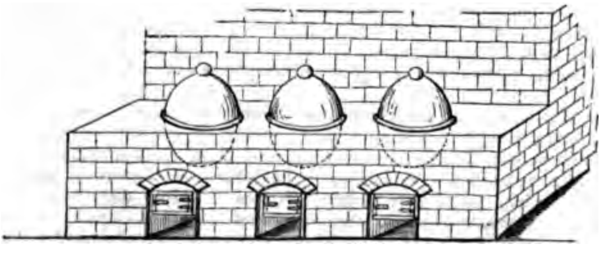
Uses, &c. It is commonly employed by *bakers*, to give lightness to their fancy goods, and to make extemporaneous bread and pastry; by the *chemist* and *pharmaceutist*, for the preparation of other salts of am in analysis, &c. In *medicine*, it i stimulant, antispasmodic, antacid phoretic, in *acidity of the stomacl affections, gout, scrofula, hysteria, spirits, epilepsy*, &c.; and in the attending dentition. It has be recommended, by Dr. Barlow, i It is also employed to make draughts; and *externally*, as a cou and stimulant. Its use as a *nas* in headaches, fainting, &c., is well *large doses*, it is emetic; in exce poisonous. Its long-continued use, is often productive of very serious c —slow fever, debility, emaciati loss of teeth, hæmorrhage, gener and even death. The *antidotes* and *treatment* are, the *free use* of lemon or malt-liquors, new milk, and a vegetables, with a generous diet, o red meats form a large proportion. a *stimulant* or *diaphoretic*, 5 to solved in cold water; as an *emeti* gr., in tepid water, repeated if n an *effervescing saline draught*, 1 A few grains (8 or 10) dissolved i of *cold water*, is an excellent ' r lowness of spirits, or after fatig highly esteemed by drunkards; be case, preferable to ' spirit of sal vo

Concluding remarks, Patents, &c sion of the above, it may be add the *large scale*, the distillation carried on in cast-iron retorts, sim shape, and character, to those emp manufacture of coal-gas, and of wl more, are commonly set horizont same furnace. (See *engr.*) Each r mouth (*a*), through which the ' ch troduced, closed with a movable dc securely fastened in its place, in shown in the *engr.;* and is furnis upper part of its further end, w pipe (*c*), to carry off the evolved f condenser or receiver. The latte two large square wooden chambers (with lead, and either fitted wi covers, secured by water-joints, or in the side, to permit of the easy the sublimed salt. The first recei nicates with the second by means lead tube (*d*) near its centre, and tube (*d'*), somewhat smaller, and bottom, but above the surface of of water in the second receiver, be to. These chambers have also a lea stopped during the process with cock of lead, to allow of the liquid the distillation, &c., to be dra run into another receiver or will. Both chambers are placed wooden supports, or scaffolding them on a level with the retc the *impure* sulphate or other amn used in the manufacture of the more; and the acid is added by raising the *gutta-percha carboys* containing it by means of cranes, and then thoroughly mixing it with the liquor by means of powerful 'agitators,' whilst the offensive fumes are either passed off as before, or made to traverse the fire of the steam-engine before entering the chimney-shaft. The *quantity* of *acid* employed to effect *saturation* must, of course, depend on the ammoniacal strength of the gas-liquor operated on. The usual proportions are 1¼ to 2 *lbs.* of the *former*, to each *gal.* of the *latter*; but in all cases sufficient should be added to impart a *very faint* acid reaction to the mixture. This last having been effected, the saline solution, now containing *hydrochlorate of ammonia*, is, after repose, ready to be pumped or run off into the evaporators.

The EVAPORATION of the crude saline solution is usually carried on in large square or rectangular *cast-iron vats*, of very moderate depth, and capable of holding from 1000 to 1500 gallons, or more. These are encased in brickwork, and are *heated* by a furnace, of which the flues pass in a sinuous course beneath the lining of brickwork on which the vats or pans rest. During the concentration of the liquid, the tar, &c., which separates and floats on the surface, and which thus seriously impedes evaporation, is, from time to time, removed by skimming. As soon as the sp. gr. reaches 1·25, *any excess* of *acid* in the solution is *exactly* neutralised with a little fresh *ammoniacal liquor*; by which any waste of acid is prevented, at the same time that any ferric salt present, and which would contaminate the ultimate product, is precipitated as sesquioxide. After settling for a short time, the hot liquor is ready to be transferred to the crystallisers.

The *vessels* employed in the CRYSTALLISATION are *pans* or *tubs*, usually circular, and about 7 or 8 feet *wide*, by 2½ to 3 feet *deep*; and are generally set on the ground, or are imbedded either partially or wholly in it. The saline liquor being pumped or run into them at a little below the boiling temperature, crystallises as it cools; the only interference being *occasional* stirring o
tion, to prevent the formation of large c
which would be inconvenient in the sub
part of the process. The *time* occupied
crystallisation varies, according to the
the 'crystallisers,' and the weather, fr
4 to 8 or even 10 days. The 'mother-
of the 'crystallisers' is pumped back i
evaporating pans for further concen
The crude blackish salt (*hydrochlorat*
obtained is contaminated with tarry an
ginous matter, free acid, water, &c.; fro
of which it is freed by exposing it in
about 4 inches deep, on a *cast-iron plate*
heated by a zigzag flue of a small f
until *all* the water is expelled; care
taken that the heat never rises high enc
volatilise the salt. This operation is ge
performed under a dome, or the ex
throat of a large chimney. The salt w
have become of a greyish-white colour,
ready for the next operation.

The crude dry salt of the last pro
finally *purified* by SUBLIMATION. F
purpose *cast-iron pots* lined with *cla*
heated from *below* and by flues roun
sides, are employed. (See *engr.*) Th
grey salt is beaten down into the
until they are about 2-3rds filled, wh
heads or capitols are fitted on, an
applied. The latter are very heavy,
usually made of *lead* (sometimes of *ir*
have the form of a dome, or a hemis
cup, with a small tube or hole at the
which a *plug* is loosely placed, to per
escape of steam. These domes or he
so made as to fit *closely* and *firmly*
flat rim or flange of the 'sublimers;'
retained in their places, during use,
their weight, and by 2 or 3 clamps p
for the purpose. They are also furnish
3 rings, set at equal distances, to allow
being lifted off, or moved, by means of
and chains. The due *application* and
tion of the *heat* is here of the utmost
ance. If the temperature employed
high, the sublimed salt will be conta
with empyreumatic matter, whilst som



will be carried beyond the dome and lost; and if it be *extreme*, the head may be altogether blown off, and the contents of the pan scattered about the building; whilst on the other hand, if the heat employed be too *l*
resulting cake of sal-ammonia will l
spongy, and either grey or yellowish
proper temperature is said to be known

than from 2 to 3 inches above the surface of the gypsum; and the lowest or last filter is supplied with fresh gypsum at each separate charge of fresh liquor. A little water is lastly passed through the filters to wash out the portion of ammoniacal liquor absorbed or retained by the filtering media. In this way, the gypsum of the filters is converted into carbonate of lime at the expense of the carbonate of ammonia in the solution; whilst the ammonia of the latter decomposes the gypsum, and becomes converted into sulphate of ammonia, which, with some free ammonia, is found in the filtrate. Sulphuric acid is next added to the filtered liquor, to completely *neutralise* the free and carbonated alkali still existing in it; after which it is evaporated in a leaden boiler, with frequent skimming to remove floating oil, until of the sp. gr. 1·160. Chloride of sodium (common salt), in sufficient quantity to convert all the sulphate of ammonia in the liquid into hydrochlorate, by double decomposition, is now added, with constant stirring; after which the clear portion is either pumped or syphoned off into a somewhat deep reservoir or tank, where it is allowed to settle. The liquid, after sufficient repose, is pumped from the reservoir to the boilers, and evaporated, with frequent agitation, so long as the sulphate of soda now existing in it falls to the bottom in granular crystals. These crystals are, at intervals, scraped to the cooler portion of the pan or boiler, whence they are removed by copper rakes and shovels, into draining-hoppers, placed near the edges of the pan. The liquor in the boiler is now a strong solution of sal ammoniac, but still containing a little sulphate of soda, from which it has to be freed by crystallisation. With this object, it is further concentrated, and then run or pumped into the crystallisers. In 30 or 40 hours, or longer, the mother-liquor is run or pumped off. The mass of newly formed crystals is then drained, and slightly washed, first with a little weak solution of sal ammoniac, and next with a very little cold water; after which they are again well drained. The crude HYDROCHLORATE OF AMMONIA, thus obtained, is converted into the pure salts, by desiccation and sublimation, as before.

In France, where this method is very generarlly employed, the sublimation is commonly conducted in stoneware or earthenware balloons or bottles coated with loam, of about 18 to 20 inches in height in the body, and either surmounted with inverted 'cups' or 'heads' 10 or 12 inches high, or simply covered with a tile, when (in the latter case) the sublimate collects in the upper part or neck of the balloon, which is above the action of the fire. A number of these vessels are set on the dome of a furnace, which is perforated with holes or slits, to allow the heat to pass through; whilst their necks or heads are sheltered from the action of the fire by plates of iron or earthenware, having semicircular indentations on their edges, so that when placed together they form a l through which the necks of th protrude, and fit closely. The fi regulated, so as to cause the salt in the upper and cooler part of th in the heads, as the case may be care is taken to occasionally clea with a skewer, to prevent choking quent bursting.

In Scotland, where a similar pr commonly pursued, the sublimers, Dr.[1] Ure, are generally "cast-iron with fire-proof tiles; the condens effected in globular heads of greer which each of the iron pots are ca

Ratio. Gas-liquor contains c ammonium (chiefly), with chlorid hydrosulphate, cyanide, sulphocya the same radical. On neutralisati drochloric acid, or sulphuric aci converted into chloride or sulpha nium, according to the acid used. tion with chloride of sodium, the ammonium is converted, by doubl sition, into choride of ammonium, limes; and sulphate of sodium, wh in the subliming pot. A similar ch when the solution of the sulpha crystallisation, is decomposed by of chloride of sodium, or any otl When the 'gas-liquor' is at once co chloride of ammonium by the additi chloric acid, the sublimation me the salt. Like changes occur whe is employed.

Comp. Chemically considered, tl sists of equal VOLUMES of gaseo and hydrochloric acid gas conder solid form; or, by WEIGHT, accor ammonia-theory, of—

	Atoms.	Equiv.
Ammonia (NH_3) .	1 ...	17·
Hydrochloric acid (HCl) . . .	1 ...	36·5
Hydrochlorate of Ammonia (NH_3HCl)	1 ...	53·5

Or, according to the 'ammonium-t

	Atoms.	Equiv.
Ammonium (NH_4)	1 ...	18·
Chlorine (Cl) . .	1 ...	35·5
Chloride of Ammonium (NH_4Cl)	1 ...	53·5

Prop., &c. The sal ammoniac, is found under the form of large spherical, cup-like cakes or masses fragments which are sections of th ing a tough, fibrous, semi-crystal and very difficult to powder. It has a saline taste somewhat sharp

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[1] Ure's "*Dict. of Arts, M., & M.*," 5th E

Among *improvements* having for their object the substitution of cheap *chlorides*[1] for the more expensive commercial acids, may be mentioned those of—

1. Mr. Laming (*Patent* dated 1843), who employs a strong solution of CHLORIDE OF CALCIUM for converting the *ammonia* of gas-liquor into the *hydrochlorate*.

2. Mr. Hills (*Patent* dated 1846) employs CHLORIDE OF MAGNESIUM[2] in the same way; and by a subsequent patent, proposes to convert the *ammonia* eliminated in the distillation of coal into the *hydrochlorate*, by mixing CHLORIDE OF MAGNESIUM with the coal in the retorts, or by introducing the chloride into a retort appropriated for the purpose. The heat dispels the chlorine of the chloride, in the form of hydrochloric acid, and this, uniting with the ammoniacal vapour, forms hydrochlorate of ammonia, which is retained in the liquor of the condenser. From this liquor, the salt is obtained by evaporation, &c., in the usual way.

3. Mr. Croll (*Patent* dated 1849) converts the crude ammoniacal vapours that issue with the gas from the common retorts into the *hydrochlorate*, and obtains a solution of it, by passing the gas through a solution of crude CHLORIDE OF MANGANESE[3] (1 *cwt.* of the *salt* to about 40 *galls.* of *water*), contained in one of the ordinary vessels used for purifying coal-gas. The manganic solution absorbs the ammonia and its salts, converting them into the *hydrochlorate*, whilst a correspondin proportion of oxide of manganese is precipitated. As soon as the liquor in the purifier is fully saturated, it is drawn off, and replaced by a fresh quantity; whilst the saturated liquor containing the *hydrochlorate*, after subsidence, or filtration, is evaporated, &c., as before. Crude CHLORIDE OF IRON may be substituted for the chloride of manganese, in the above process; as may also SULPHATE OF MANGANESE, but then the product, of course, will be *sulphate of ammonia*, instead of the hydrochlorate.

4. Mr. Laming (*Patent* dated 1850) also proposes the use of various *salts* and *mixtures* for retaining and condensing the ammoniacal vapour of coal-gas, as it passes from the retorts through the purifiers. Of these the principal are CHLORIDE OF CALCIUM obtained by decomposing *chloride of iron* by *hydrate of lime*; CHLORIDE OF IRON, obtained by decomposing *sulphate of iron* with *chloride of sodium*; CHLORIDE OF MAGNESIUM; a mixture of SULPHATE OF LIME and SULPHATE OF IRON; or of moist *precipitated o*
with *carbonate of lime*, *carbonate o*
or *magnesian limestone*; or one
sulphate of magnesia, or *chloride o*
or *calcium*, or one, or more of th
bination with *oxide of copper*, eit
without *lime* or *magnesia*, or wi
either of them or their *carbona*
salts, or compounds, are mingled
dust, or some other porous substan
on by the gas, before being p
purifiers; and after they becom
with the vapour, the newly for
chlorate or *sulphate* (according to
mixture employed), is washed out
with water.

Besides the usual sources of SAI
(and the other ammonia-salts of c
has been proposed to obtain it
peat, *shale*, &c., as noticed under
BONATE OF AMMONIA (*suprà*); th
employed to effect the *neutralisati*
position of the ammoniacal liqu
this case, either *hydrochloric acid*

In Young's *Patent* (1841) fo
AMMONIA and its SALTS,' a mixtur
of *guano*, and 1 part of *hydrate*
distilled in a retort placed vert
moderate heat, gradually increase
bottom of the retort becomes red
ammoniacal portion of the fumes
absorbed by the *cold water* con
suitable condenser; whilst the
eliminated by the process pass off
By subsequently passing *carbonic*
the liquor of the condenser, a
CARBONATE, BICARBONATE, or
BONATE of AMMONIA is formed.
filling the condenser with *diluted*
or *sulphuric acid*, instead of wi
solution of HYDROCHLORATE or
of AMMONIA is obtained.

Stale urine saturated with *hydro*
or with *sulphuric acid* diluted with
its weight of *water*, yields SAL A
SULPHATE OF AMMONIA (according
used) on evaporation.

Hydrochlorate of ammonia is
prepared on the large scale, and
dealer or retailer, by whom it i
sionally refined or purified, in sma
for chemical and medical purpos
ammoniac of commerce is found
ciently pure for all its ordinary ap
the arts; but when wanted of grea
is broken into pieces, and resublim
earthenware vessel into a large
earthenware or glass. The produ
SAL AMMONIAC, DOUBLE-REFINED
MONIÆ HYDROCHLO″RAS PU″RA, S
ACUS DEPURA′TUS†, L.) is popular
FLOWERS OF SAL AMMONIAC (*flo′r*
moni′aci, L.), from being in a fi
crystalline state.

The chemically pure chloride of
may be prepared by bringing its ga

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[1] Particularly such *chlorides* as are the 'waste or bye products' of other manufactures.

[2] Of the Epsom-salt works, &c.

[3] Obtained from the chloride-of-lime works. The portion of the precipitated oxide of manganese saved from the process, may be reconverted into the *chloride*, by mixing 3 *parts* of *it* with 4 *parts* of *common salt*, and heating the mixture to low redness, scarcely perceptible in the dark, for 2 to 3 hours. 140 *lbs*. of the calcined mass, with 40 *galls*. of *water*, forms a solution that may be again pumped into the purifier.

with *water*, to form *freezing mixtures*, for which purpose it may be used for any number of times by simply evaporating the solution to dryness, when the salt, obtained unaltered, is ready for another operation. Care, however, should be taken not to expose it to too great a heat, as at a certain temperature it deflagrates with violence. It is occasionally employed in the *laboratory* to promote the combustion of organic bodies during incineration; and sometimes, though seldom, in *medicine*, as a diuretic and diaphoretic. It is said to reduce the frequency of the pulse, and the animal heat, without affecting the head, chest, or stomach. (Wibmer.)—*Dose.* 10 to 30 gr.

Ammonium, Nitro-sulphate of. *Syn.* AMMO″NIÆ NITRO-SUL′PHAS, L. Dissolve *sulphite of ammonium*, 1 part; in *solution of ammonia*, 5 parts; and pass *nitric oxide gas* through the solution; rapidly wash the crystals that form with *solution of ammonia*, dry in bibulous paper, without heat, and preserve them in a well-stopped bottle.—*Dose.* 10 to 12 gr.; in typhoid fevers, &c.

Ammonium, Oxalate of. $(NH_4)_2C_2O_4$. *Syn.* AMMO″NIÆ OX′ALAS, L.; OXALATE D'AMMONIAQUE, Fr. Neutralise a hot *solution of oxalic acid* with *sesquicarbonate of ammonia*; evaporate and crystallise.

Prop. It forms beautiful, colourless, long, rhombic prisms, which effloresce in the air; slightly soluble in *cold* water; freely soluble in *hot* water; heated in a retort, it yields ammonia, carbonate of ammonia, cyanogen, and carbonic acid, together with oxamide, which sublimes.

Uses, &c. In *chemistry*, chiefly as a test for calcium (with which it produces a white precipitate soluble in nitric acid), and to separate lime from magnesium, solutions of the salts of which it does not precipitate. A BINOX′ALATE may also be formed; but it possesses no practical interest.

Ammonium, Phosphate of. $(NH_4)_3PO_4$. *Syn.* AMMO″NIÆ PHOS′PHAS, L. *Prep.* Saturate a *solution of phosphoric acid* with *sesquicarbonate of ammonium*, in slight excess; gently evaporate and crystallise by refrigeration. Diuretic, discutient, and antilithic.—*Dose.* 3 to 10 gr., or 20 to 30 drops of a saturated solution, 3 or 4 times a day; in gout, rheumatism, and calculus, accompanied with the lithic acid diathesis; also in rickets and certain forms of dyspepsia.

Ammonium Suc′cinate. *Syn.* AMMO″NIÆ SUC′CINAS, L. *Prep.* 1. *Succinic acid*, 1 part; *water*, 4 parts; dissolve, neutralise with *solution of ammonia*, or of *ammonium carbonate*, in slight excess, and evaporate, and crystallise as directed under the 'benzoate' or 'phosphate.'—*Dose.* 5 to 10 gr.

Ammonium, Sul′phate of. $(NH_4)_2SO_4$. *Syn.* SULPHATE OF OX′IDE OF AMMONIA; AMMO″NIÆ SUL′PHAS, L.; SULFATE D'AMMONIAQUE, Fr.; SCHWEFELSAUER AMMONIUM SALZ, Ger.; Glauber's SECRET SALT†, G. SECRET SAL AMMONIAC†, SAL AMMONI′ACUM SECR GLAUBE″RI†, &c. Crude sulphate of am exists in considerable quantity in the soot pit-coal; and it is obtained, as a seco product, from the *ammoniacal liquor* o works and animal charcoal manufa These last are its chief sources. It found native, associated with sal ammon the neighbourhood of volcanoes, unde name of '*mascagnine*' or '*massagnise*.'

Prep. 1. (Medicinal.) Saturate *dilute phuric acid* with *sesquicarbonate of am* in slight excess; filter, gently evaporate crystallise.

2. (Commercial.) From *gas-liquor* or *spirit*, saturated with *weak oil of vitriol* the clear portion of the liquid, after decanted, concentrated by rapid evapor and crystallised, in the manner noticed AMMONIUM, CHLORIDE OF.

Prop. Crystals, long, flattened, six- prisms; soluble in 2 parts of *cold*, and *boiling* water; fuses, with loss of one ato water, at about 280° Fahr.; and is volatil with entire decomposition, at about 535°. its solution, by long boiling, becomes acid loss of ammonia. The anhydrous salt does exist.

Uses, &c. Pure sulphate of ammoni diuretic, aperient, resolvent, and stimu —*Dose*, 10 to 30 gr. It is now seldom ployed in medicine. The *crude sulphate* is cipally used in the preparation of sal amm and sesquicarbonate of ammonia, and manure. "A mixture of 10% of this sul with 20% of *bone-dust*, some *gypsum*, and *f yard manure*," forms "a very fertilising post, applicable to a great variety of (Ure); and we may add—greatly superior very large portion of what is now so comm vended under the name of 'guano.'

Concluding remarks, Patents, &c. manufacture of *sulphate of ammonia*, on *large scale*, has been unavoidably explain treating on the salts of that base already ticed. All that is necessary, is to sat with *sulphuric acid* the solution of amm crude or otherwise, and obtained in any ner; and then to evaporate the solution the salt crystallises out. At other times, ever, instead of adding the *acid* to the am niacal liquor, the *latter*, either at once, or treatment with *lime*, is submitted to dis tion, and the evolved alkaline vapour is p into the acid (previously somewhat dilu contained in a large receiver or cistern, series of them; the salt being obtained the resulting solution in the usual man By *re-solution* and a *second* crystallisation, sulphate is generally obtained sufficiently for all commercial purposes; but when the is intended for use as manure, or (unless rough) for conversion into sal ammoniac, need not be had recourse to.

Among *modifications* and *improvements*, previously noticed, may be mentioned—

2. Digest *hydrocyanic acid* with *yellow sulphydrate of ammonium*, and, after a time, evaporate as before.

A deliquescent, white, saline mass, very soluble in water, but seldom employed out of the laboratory in a pure state. Of late it has been obtained in quantity as a crude product of the gas liquors.

Ammonium, Tartrates of. Of these there are two:—

Ammonium, Neutral Tartrate of. $(NH_4)_2C_4H_4O_6$. *Syn.* AMMO″NIÆ TAR′TRAS, L. *Prep.* Saturate a solution of *crystallised tartaric acid*, 150 grs.; with *sesquicarbonate of ammonium*, 118 grs.; and either evaporate the solution at a gentle heat, and crystallise; or evaporate to dryness, and powder the residuum.

Prop., *&c.* Prismatic crystals, or a crystalline mass; soluble and efflorescent. Its *medicinal properties* and *doses* resemble those of citrate of ammonium.

Ammonium, Bitartrate of. $NH_4HC_4H_4O_6$. *Syn.* AMMO″NIÆ BITAR′TRAS, L. *Prep.* To a strong solution of *tartaric acid*, add another of *sesquicarbonate of ammonium*, or of *tartrate of ammonium*, as long as a precipitate falls; which must be collected and dried.

Prop., *&c.* A crystalline powder, only slightly soluble in water, closely resembling ordinary cream of tartar. It is diaphoretic, diuretic, and deobstruent, and is frequently, though improperly, sold for the preceding preparation.

Ammonium, Valerianate of. $NH_4C_5H_9O_2$. *Syn.* AMMO″NIÆ VALERIA′NAS, L. *Prep.* Saturate *valerianic acid* with *strong solution of ammonia*, and evaporate the resulting liquid to a syrupy consistence at a heat under 175° Fahr.; then add *twice* its *volume* of *alcohol*, and, after agitation, allow it to crystallise by spontaneous evaporation.—*Dose.* 2 to 8 or 10 grs.; in neuralgia, epilepsy, hypochondriasis, hysteria, low fevers of an intermittent kind, &c.; also in dyspepsia and debility complicated with these affections.

AMMONI′ACAL. [Eng., Fr.] *Syn.* AMMONIACA′LIS, L. Pertaining to, or possessing the odour or properties of, ammonia. See AMMONIA, PERFUMES, &c.

AMMONI′ACUM. *Syn.* GUM AMMONIACUM, G. AMMO″NIAC†; GOMME AMMONIAQUE, Fr.; AMMONIAK, Ger. A gummy-resinous exudation from the stem of *dorema ammoniacum*, in tears and masses, of a pale cinnamon colour, brittle, and when broken has a white and shining surface. Collected in Persia and the Punjaub. (B. P.)

Gum ammoniacum has an unpleasant odour, especially when heated, and a nauseous and slightly bitter taste. It is a mild, stimulating expectorant and emmenagogue; and its effects on the system resemble those of assafœtida, except in being weaker. *Externally*, it is resolvent.—*Dose*, 10 to 30 grs. in pills or emulsion.

Strained′ Ammoniacum. *Syn.* PREPARED AMMONIACUM; AMMONI′ACUM PREPA (Ph. L.), L. *Prep.* (Ph. L. 1851.) *ammoniacum* in *water* just sufficient it; strain the mixture through a h and constantly stirring, evaporate in bath, until, on cooling, it becomes ha *product*, owing to a loss of volatile oil, weaker than the unprepared gum-re process is only necessary with roug ammoniacum.

Ammo″niated. *Syn.* AMMONIA′TU *pharmacy*, *perfumery*, &c., applied to tions containing ammonia.

AMMO′NIO-, Ammon′ico-. In *che* common prefix to double salts co ammonia; as *ammonio-citrate*, *a.-chl a.-tartrate of iron*, &c. See the r metals.

†‡† The *sp. gr.* of any *sample of li monia*, expressed in three integers, from ·998, and the remainder *divid* gives a number which represents the *pe strength*, nearly. (Ure.) This rule sometimes conveniently employed f calculations, in the absence of *Tables*.

TABLE II.—*Showing the per-centage* AMMONIA, *and of* AMMONIA-WATER *in Water of Ammonia of the give gravities, at* 60° Fahr. By Dr. UR

Sp. Gr. by experiment.	Water of Ammonia of ·900, per cent.	Pure Ammonia, per cent.
·9000	100	26·500
·9045	95	25·175
·9090	90	23·850
·9133	85	22·525
·9177	80	21·200
·9227	75	19·875
·9275	70	18·550
·9320	65	17·225
·9363	60	15·900
·9410	55	14·575
·9455	50	13·250
·9510	45	11·925
·9564	40	10·600
·9614	35	9·275
·9662	30	7·950
·9716	25	6·625
·9768	20	5·300
·9828	15	3·975
·9887	10	2·650
·9945	5	1·325

⁂ *Strengths* corresponding to *sp.* are not in the above *Tables*, may be the 'method of differences' explain ALCOHOLOMETRY (*p.* 68-9).

AMONTILLADO. [Sp.] See SH WINE.

AMORPH′OUS (-morf′-ŭs). *Syn.* AM L.; AMORPHE, INFORME, DIFFO pound body into its constituent parts or elements, for the purpose of either determining their nature, or, when this is known, their relative proportions. It is divided into QUAL'ITATIVE ANALYSIS and QUAN'TITATIVE ANALYSIS; and these again into PROX'IMATE ANALYSIS and UL'TIMATE ANALYSIS. The first consists in finding the components of a compound, merely as respects their nature or names; the second, in finding not merely the component parts, but also the proportions of each of them; the third gives the results in the names of the proximate or immediate principles or compounds which, by their union, form the body under examination;[1] whilst the fourth develops the chemical elements of which it is composed.[2] An analysis may also be made to determine whether a certain body is or is not contained in a compound (as lead in wine); or it may be undertaken to ascertain all the constituents present; the extent of an investigation being merely limited by the object in view.

For success in chemical analysis a thorough acquaintance with the various properties of bodies is required, as well as aptitude in applying this knowledge in discriminating them, and separating them from each other. Judgment and expertness in manipulation are, indeed, essential qualifications. The method pursued must likewise be such as to attain the object in view with unerring certainty, and in the most expeditious manner. "The mere knowledge of the reagents, and of the reactions of other bodies with them, will not suffice for the attainment of this end. This requires the additional knowledge of a systematic and progressive course of analysis, or, in other words, the knowledge of the order, and succession, in which solvents, together with general and special reagents, ought to be applied, both to effect the speedy and safe detection of every individual component of a compound or mixture, and to prove with certainty the absence of all other substances. If we do not possess this systematic knowledge, or if in the hope of attaining an object more rapidly, we adhere to no method in our investigations and experiments, analysing becomes (at least in the hands of a novice), mere guess work, and the results obtained are no longer the fruits of scientific calculation, but mere matters of accident, which sometimes may prove lucky hits, and at others total failures." (Fresenius.)

ANASTAT'IC PRINTING. See PRINTING and ZINCOGRAPHY.

ANATOM'ICAL. *Syn.* ANATOM'ICUS, L.; ANATOMIQUE, Fr.; ANATOMISCH, Ger. Belonging to anatomy or dissection.

Anatomical Prepara'tions. Objects of interest in both surgical and pathological anatomy,
and specimens in natural history, preserv
subjecting them to antiseptic process
which is also frequently added injection
coloured fluids (which subsequently har
amalgams, or fusible metal, in order to di
more fully the minute vessels, or the
scopic anatomy of the several parts.
FUSIBLE METAL, INJECTIONS, PREPARAT
PUTREFACTION, SKELETONS, SOLUTIONS, &

ANCHO'VY (-chō'-). *Syn.* ANCHOIS,
ANCHOVE, ANSCHOVE, Ger.; ACCIUGHE,
CHIOVE, It.; ANCHOVA, Port., Sp. The
pea encrasic'olus (Linn.), a small fish of
herring tribe, closely resembling the Eng
sprat. It is common in the Mediterran
and occurs in the greatest abundance, an
the finest quality about the island of
gona, near Leghorn. It is taken in the ni
during May, June, and July.

Anchovies are prepared for sale or expo
tion by salting or pickling them—the he
intestines and pectoral fins having been
removed, but not the scales—and afterw
packing them, along with rock-salt, in
small kegs in which they are imported
this country. The small fish are valued
than the larger ones. For the table
are often fried to a pale amber colour, i
or butter; having previously been scr
clean, soaked for an hour or two in w
wiped dry, opened (without dividing the
and had the back-bones removed. Be
being put into the pan they are usually hi
seasoned with cayenne; and after being
closed, are dipped into a rich light ba
They are also divided into fillets, and se
as sandwiches, or in curried toasts.
chovies are also extensively potted (POT
ANCHOVIES), and made into butter (A.-BUTT
and into sauce (A.-SAUCE), particularly
last.

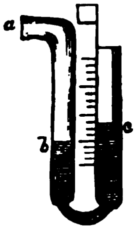
The anchovy has a fine and peculiar flav
and is eaten as a delicacy all over Europe.
was known to the Greeks and Romans,
prepared from it a kind of garum for
table. It is said to be aperitive, stimul
and stomachic.

The high price of genuine Gorgona an
vies has led the fraudulent dealer to ei
substitute for them, or mix with them, fis
a less expensive kind. The most frequent s
STITUTIONS are Dutch, French, and Sici
fish of allied species or varieties, sardines,
even the common sprat. The genuine
gona fish is about the length of one's fin
and may be known by its silvery appear
by the greater thickness of its head, whic
sharp-pointed, with the upper jaw consider
the longest, and the mouth deeply divided;
dusky brown colour of its back,[3] and the
salmon colour of its flesh. When only 3 mo
old, its flesh is pale; when of 6 mon
rather pink; when of 10 to 12 months
in its prime), a beautiful deep pink col

[1, 2] Thus, *suet* consists of olein, palmitin, and stearin. These would form the 'terms' of the PROXIMATE ANALYSIS of this substance. But olein, palmitin, and stearin consist of carbon, hydrogen, and oxygen. The ULTIMATE ANALYSIS of suet would, therefore, have reference to the elements carbon, hydrogen, and oxygen.

[3] The *colour* of the *top of the head* and *back* is, in recent fish, *blue*, with a *tinge of green*. (Yarrell.)

Ger. An instrument or apparatus for measuring the force or velocity of the wind, or of a current of air. Various contrivances have been adopted for this purpose. The *anemometer* of Dr. Lind being also applicable to the determination of the draught of a chimney, and the strength of air-currents in ventilation, may be usefully described here:—



Desc. & appl. The open end (*a*) is kept, by means of a *vane*, presented to the wind, which acting on the surface of the water or other liquid in (*b*), raises the level of the fluid in the arm (*c*.) The *difference* of the *level* of the fluid in the two arms of the instrument is the measure of the force of the wind. To *estimate* the *draught* of a *flue* or *chimney*, the arm (*c*) is placed in the chimney, and the orifice (*a*) in the apartment.[1]

ANEMOM'ETRY. *Syn.* ANEMOME'TRIA, L.; ANÉMOMETRIE, Fr.; WINDMESSEN, Ger. In *meteorology*, *physics*, &c., the art or act of measuring the velocity or force of the wind, or of ascertaining its direction.

ANEM'ONE (ă-nĕm'-o-ne). *Syn.* ANEM'ONY; ANEM'ONE, L., Gr.; ANÉMONE, Fr. The wind-flower. In *botany*, a genus of beautiful flowering herbaceous plants, of the *nat. ord.* Ranunculaceæ. The double flowers of some of the species are among the most elegant ornaments of our gardens. Others are used in medicine. They are all acrid and stimulating.

Sea Anem'ones (-o-nēz). *Syn.* AN'IMAL-FLOWERS‡, SEA SUN'FLOWERS‡. Animals of the genus *actin'ia*, so called, from the resemblance of their claws or tentacles, when expanded, to the petals of a flower. They are of various colours, are generally fixed by one end to rocks or stones in the sand, and are very voracious, being accused of occasionally swallowing a mussel or a crab as large as a hen's egg for a meal. They belong to the highly organised *polypes* of Cuvier.

ANEMON'IC ACID. See ANEMONINE.

ANEM'OSCOPE (ăn'-e—Brande, Mayne). *Syn.* ANEMOSCO'PIUM, L.; ANÉMOSCOPE, Fr.; ANEMOSKOP, Ger. An instrument to measure the force and velocity of the wind. See ANEMOMETER.

AN'EROID (-royd).[2] In *physics*, &c., not fluid, or not depending on water or a fluid for its action; applied to a certain form of '
meter' (which *see*).

ANGEL'ICA (-jĕl'-). [L., Port., Sp.
E. & D.] *Syn.* GARDEN ANGELICA; A
LIQUE, Fr.; ANGELIKA, A.-WURZEL, A
KRAUT, Ger. The *angelica archangel*
Linnæus, an aromatic herbaceous plant
biennial, fleshy root, indigenous to the
of Europe, but frequently found wild in
land, and largely cultivated in our g
Dried root (ANGELICA, Ph. E.), aperient,
minative, diaphoretic, and tonic; much
teemed by the Laplanders, both as food
medicine;—*fruit* or *seed* (ANGELICA, Ph.
resembles the root, but is weaker. The
plant has been extolled as an aromatic
As a *masticatory*, it leaves an agreeable
ing heat in the mouth. The aromatic pro
ties of this plant depend on a peculiar vol
oil and *resin*.

Uses, &c. It has been recommende
diarrhœa, *dyspepsia*, *debility*, and some *fe*
but is now seldom used in medicine.—
30 grs. to 1 dr. The *dried root* and
are used by *rectifiers* to flavour gin
liqueurs; and the *fresh root*, *tender*
stalks, &c., are made by the *confecti*
into an aromatic candy. See CANDY,
LIQUEURS, &c.

Angelica Atropurpu"rea. [Linn.]
AMER'ICAN ANGELICA; ANGELICA, Ph.
Hab., North America. Resembles garden
gelica, but placed by some botanists
separate, though allied genus. It is a p
lar remedy for flatulent colic, indiges
and cardialgia, in the United States;
is there regarded as tonic, cordial, and
disiac.

ANGEL'IC ACID. $HC_5H_7O_2$. A vol
substance, noticed by L. A. Buchner, jun
angelica-root. It has a pungent sour
and a biting acid taste; is sometimes
and oleaginous, and sometimes crystallis
striated prisms.[3]

ANGO'LA. *Syn.* ANGO'LA-WOOL, ANGO
W., ANGO'NA-W., &c.; POIL DE CHEVRON D'
GORA, Fr.; (Engoor', Engour', or Eng
TIFTIC, Tur. The wool of 'ca'pra Angore
or the *Angora-goat*, of which the shawl
Cashmere are made, and others in imitatio
them. It is also used to make *plush*,
cloths for paletôts which are repellent of
&c.; and is extensively employed, in Franc
the manufacture of lace more brilliant
that of Valenciennes and Chantilly, an
half the price. See ALPACA, SHA
WOOL, &c.

ANGOSTU'RA, Angustu'ra (-tūre'-ă). CUSPARIA.

False Angostura. See BRUCEA, CUSPA and STRYCHNOS.

ANGOSTU"RINE, Angustu'rine (-ĭn). CUSPARINE.

ANHY'DROUS (-drŭs; *an'hydrous*, as ma
by Brande, is less usual). *Syn.* AN'HYD

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[1] The *anemometers* now generally used in meteorological observations are those of Mr. Follet Osler, Dr. Robinson, and Dr. Whewell. For a description of these instruments, see Phillip's "*Report on Anemometry*," the "*Trans. of the Brit. Assoc.*," 1846, "*Trans. Royal Irish Acad.*," &c.

[2] That is—ἀ, *without*, ὕδωρ, (the) *watery*, εἶδος, *form*, as correctly given by Brande. By some strange mistake, Dr. Mayne, in his new "*Expository Lexicon*," gives "ἀ, priv., ἀήρ, air, terminal -*ides*," as the derivation of this word; and marks it '*an'roid*.'

[3] Schmidt's "*Jahrb.*," 1842.

mixture of *isatine* and *hydrate of potassa* (both in powder); a retort connected with a well-cooled receiver, being employed as the apparatus. Said by Profs. A. W. Hofmann and Muspratt, to be "the most eligible process for isolating" aniline.[1]

5. From *anthranilic acid* mixed with powdered glass or sand, and rapidly heated in a retort.

6. By treating an *alcoholic solution of benzine* with a little *zinc* and *hydrochloric acid.*

7. By heating *phenyl-alcohol* with *ammonia* in sealed tubes.

Prop., &c. A thin, oily, colourless liquid, with a faintly vinous odour, and a hot and aromatic taste; very volatile in the air; miscible in all proportions with alcohol and ether; very slightly soluble in water; neutral to ordinary test-paper, but exhibiting an alkaline reaction to dahlia-petal infusion and paper; dissolves camphor, sulphur, and phosphorus, and coagulates albumen; possesses a high refractive power; and precipitates the oxides of iron, zinc, and alumina, from solutions of their salts, and neutralises the acids, like ammonia. With the acids it forms numerous crystallisable compounds of great beauty, and which are easily formed, and are precisely analogous to the corresponding salts of ammonia. These, on exposure to the air, acquired a rose-colour, in many cases gradually passing into brown. Its boiling-point is 359° to 360° Fahr.; *sp. gr.* 1·028.

Tests.—1. Chromic acid gives a deep greenish or bluish-black precipitate with aniline and its salts:—2. Hypochlorite of lime strikes an extremely beautiful violet colour, which is soon destroyed:—3. The addition of two or three drops of nitric acid to anhydrous aniline produces a fine blue colour, which, on the application of heat, passes into *yellow*, and a violent reaction ensues, sometimes followed by explosion:—4. With bichloride of platinum it yields a double salt (PLAT'INO-CHLO''RIDE OF ANILINE, analogous to the like salt of ammonia. These reactions distinguish it from all other substances.

Uses, &c. Chiefly in dyeing, for the production of colouring matter of various rich shades of purple and velvet, some approaching pink, by the action of chromic acid; and of a splendid crimson, by the action of various oxidising agents. It forms the basis of the celebrated new dyes for silks lately patented by Mr. W. H. Perkin, and others, and which are not only more delicate and gorgeous in tint, but also more permanent, than any produced by other substances.

Besides numerous salts, various substitution compounds of aniline have been formed, all of which possess vast scientific interest, and several are likely to prove of importance in the arts. See AMINES, DYEING, INDIGO, PHENYLE, &c. (also *below*).

Aniline, Chro'mates of. *Prep.* 1. (NEUTRAL CHROMATE.) From *sulphate* or *oxalate* [illegible] *aniline* and *chromate of potassa*, by double decomposition.

2. (BICHRO'MATE:—Mr. W. H. Perkin's.) *Sulphate of aniline* and *bichromate of potassa*, in equiv. proportions, are separately dissolved in water, and the solutions, after being mixed, allowed to stand for several hours. The whole is then thrown upon a filter, and the black precipitate which has formed is washed and dried. It is next digested in coal-tar naphtha (—? benzol), to extract a brown resinous substance; after which it is digested in alcohol, to dissolve out the colouring matter (BICHROMATE OF ANILINE), which is left behind on distilling off the spirit, as a coppery friable mass. Patented.

Aniline, Cy'anide of. Benzonitrile.

Aniline, Ox'alate of. $(C_6H_7N)_2C_2O_4$. Obtained by saturating an alcoholic solution of oxalic acid with aniline; the salt separating as a crystalline mass. It is very soluble in hot water; much less so in cold water; only slightly soluble in alcohol; and insoluble in ether. It may be crystallised from hot water or boiling alcohol. Used chiefly to form other salts.

Aniline, Sul'phate of. $(C_6H_7N)_2SO_4$. Prepared by saturating aniline with dilute sulphuric acid, and gently evaporating the liquid until the salt separates. By re-solution in boiling alcohol, it crystallises out, as the liquor cools, under the form of very beautiful colourless plates, of a silvery lustre. It is freely soluble in water, and in hot alcohol; scarcely soluble in cold alcohol; and insoluble in ether. It is chiefly employed in the preparation of the new aniline dyes.

ANIMAL'CULE (-kūle). [Eng., Fr.; *pl.* animal'cules.] *Syn.* ANIMAL'CULUM (pl., *animal'cula*[2]), L.; THIERCHEN, Ger. In *zoology* and *physiology*, a microscopic animal, or one so extremely small, that it is either invisible, or not distinctly discernible, without the aid of a lens or microscope; more especially one that is not perceptible to the naked eye. "A *mite* was anciently thought the limit of littleness; but there are animals 27,000,000 of times smaller than a mite." A thousand millions of some of the animalcula found in common water are said to be collectively of less bulk than a single grain of sand; yet their numbers are so prodigious as sometimes to give the fluid they inhabit a pale red or yellow tinge. The *milt* of a single codfish is said to contain more [illegible] these minute animals than there are people in the whole earth. Animalcula were first scientifically observed by Leuwenhoek, about the year 1677. Assisted by the microscope he unveiled, as it were, a new

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[1] Muspratt's "*Chemistry*," i, 599.

[2] Animalculæ for the *plural*, sometimes heard and met with, is a barbarism; yet one not wholly confined to the vulgar, for we find it in Vincent's edition of Haydn's admirable "*Dict. of Dates*," not merely twice, or oftener, in the text, but as a 'title-word;' and also in some other works, where we might least expect it.

for future naturalists and microscopists
ire.

IME (ăn'-ĭm-e). [Eng., L., Sp.] *Syn.*
A.-RES'IN; ANIMÉ, Fr.; ANIME-
KOURBARILLHARZ, Ger.; COUR-
JUTAIBA, Nat. A pale brownish-
transparent, brittle resin, which exudes
e *hymenæa courbaril* (Linn.) or locust-
e *H. martiana*, and other species of
s growing in tropical America. It
about ·2⅝ of volatile oil, which gives
reeable odour; melts without decom-
; is (nearly) insoluble in alcohol and
houcine, but forms a gelatinous mass
ture of the two. (Ure.) It burns
mitting a very fragrant smell. Sp.
to 1·057.

&c. As a fumigation in spasmodic
in *solution*, as an embrocation; and
, as a substitute for gum guaiacum.
untry, it is chiefly employed to make
and pastilles (which *see*).

(-y'ŭn—Br., We.; ă-nī'-ŭn—Smart).
'upward going;' in *electro-chemistry*,
e which is evolved from the surface
electrical current is supposed to enter
olyte; an electro-negative body, or
passes to the positive pole, or *anode*,
ysis, as opposed to a CATION. See
ONS, &c.

TED. *Syn.* ANISA'TUS, L.; ANISÉ,
pharmacy, the *art of the liqoriste*,
er, &c., applied to articles or pre-
impregnated or flavoured with ani-

(-ĭs). *Syn.* ANI'SUM, PIMPINEL'LA
), A. OFFICINA'LE, L.; ANIS, Fr.;
MEINER ANIS, Ger. An annual
the *nat. ord.* Umbelliferæ (DC.);
ypt, Scio, and the Levant; but
ltivated in Malta, Spain, Germany,
us other parts of Asia and Europe.
iderable quantity is cultivated at
in Surrey, chiefly for the use of the
of British Spirits." (Stevenson.)
iseed. (See *below*.)

EED. *Syn.* AN'ISE, AN'ISE-SEED;
ANI'SI, FRUC'TUS A., L.; ANIS, A.
AINES D'ANIS, SEMENCE D'ANIS, Fr.;
ISAMEN, Ger.; ANIS, Sp.; ANICE, It.
atic fruit or seed of the *pimpinella*
st noticed.

Uses, &c. Its aromatic properties
n the presence of volatile oil. The
oil, and a *spirit* and a *water* prepared
n, are officinal in the pharmacopœias.
seed and its preparations are reputed
, stomachic, carminative, pectoral,
and emmenagogue. They are com-
ed to relieve flatulence and colicky
d to prevent the griping effects of
athartics; and they have long been
emedies for coughs, colds, and other
ments. They are esteemed especially
warming the stomach and expelling
rticularly during infancy and childhood; the *distilled* or *flavoured water* being usually employed. Nurses also take the latter to promote the secretion of milk, to which it at length imparts its peculiar odour and flavour. In *veterinary practice*, the powdered seed is used as a carminative, pectoral, and corroborant. The *essential oil* is said to be poisonous to pigeons. (Vogel; Hillefield.) Aniseed is principally used to flavour liqueurs, sweetmeats, and confectionery.—*Dose* (of the powder), 10 grs. to 1 or 2 drs.;—for *a horse*, ½ to 1 *oz.*;—*cattle*, ¾ to 2 *oz.*

Pur., &c. Powdered aniseed is nearly always adulterated, the adulterant being generally linseed meal. Sometimes, as for the horse, the latter is entirely substituted for it, a few drops of oil of aniseed being added to give it smell. The adulteration is not readily detected by the uninitiated, owing to the strong odour of aniseed; but readily by the microscope. The fruit of *myrrhis odorata* (*sweet cicily*), and of *illicium anisatum* (*star-anise*), also possess the odour and flavour of common aniseed; indeed, most of the essential oil now sold as 'oil of aniseed,' is star-anise oil. See LIQUEURS, OILS, POWDERS, SPIRITS, WATERS, &c.

Star'-Anise. The fruit or seed of *illi''cium anisa'tum* (Linn.), an evergreen tree growing in Japan and China. The odour and properties of both the seed and oil greatly resemble those of common anise. They are both employed by the liqueuriste. See ANISEED (*above*), &c.

ANISETTE' (ăn-ĭz-ĕt'). [Fr.] Aniseed cordial. See LIQUEURS.

ANI'SUM. Aniseed.

ANNEAL'ING. *Syn.* NEALING†§; LE RECUIT, Fr.; DAS ANLASSEN, Ger. The art of tempering by heat; appropriately, the process by which glass, porcelain, &c., are rendered less frangible, and metals which have become brittle by fusion, or long-continued hammering, again rendered tough and malleable.

Glass vessels, and other *articles of glass*, are annealed by being placed in an oven or apartment near the furnaces at which they are formed, called the '*leer*,' where they are allowed to cool very slowly, the process being prolonged in proportion to their bulk.

Steel, *iron*, and other *metals* are annealed by heating them and allowing them to cool slowly on the hearth of the furnace, or in any other suitable place, unexposed to the cold.

Cast-iron is rendered tough and malleable, without 'puddling,' by embedding it in *ground charcoal* or *hæmatite*, and thus protected, keeping it exposed at a high temperature for several hours, after which the whole is allowed to cool very slowly.

Prince Rupert's drop may be mentioned as an example of unannealed glass; and common cast iron, of unannealed metals; to which heads the reader is referred.

ANNOT'TA. *Syn.* Anot'to, Annat'to, Annat'ta; Arnat'to, Arnot'to, &c.; Orlea'na, Ter'ra o.*, &c., L.; Roucol, Rocou, Roucou, Fr.; Orleans, Ger. A colouring matter forming the outer pellicle of the *seeds* of the *bix'a orella'na* (Linn.), an exogenous evergreen tree, common in Cayenne, and some other parts of tropical America, and now extensively cultivated in both the E. and W. Indies. It is usually obtained by macerating the crushed seeds or seed-pods in water, for several weeks, ultimately allowing the pulp to subside, which is then boiled in coppers to a stiff paste, and dried in the shade. Sometimes a little oil is added in making it up into cakes or lumps. A better method is that proposed by Leblond, in which the crushed seeds are simply exhausted by washing them in water (—? alkalised), from which the colouring matter is then precipitated by means of *vinegar* or *lemon-juice;* the precipitate being subsequently collected, and either boiled up in the ordinary manner, or drained in bags, and dried, as is practised with indigo. Annotta so prepared is said to be four times as valuable as made by the old process.

Prop. Good annotta is of a brilliant red colour; brighter in the middle than on the outside; feels soft and smooth to the touch; has a good consistence, and a strongly characteristic, but not a putrid smell. It is scarcely soluble in water; freely soluble in alcohol, ether, oils, and fats, to each of which it imparts a beautiful orange colour, and in alkaline solutions, which darken it; acids precipitate it of an orange red hue; strong sulphuric acid turns it blue. Its most important property is the affinity of its colouring matter for the fibres of silk, wool, and cotton.

Pur. Annotta is very frequently adulterated; indeed, nearly always so. The *adulterants* are generally *meal, flour*, or *farina*, and often *chalk* or *gypsum*, with some *pearlash* and *oil*, or even *soap*, to give it an unctuous character, *turmeric, Venetian red, red ochre*, or even *orange chrome*, to give it 'colour,' and *common salt* and, sometimes, even *sulphate of copper*, to prevent decomposition—the last two being POISONOUS. Sometimes a little *carbonate of ammonia* is also added to it, to improve the colour. When quite pure, it contains about 28% of resinous colouring matter, and 20% of colouring extractive matter, (Dr. John,) and should leave only a small quantity of insoluble residuum after digestion in alcohol; whilst the *ash*, resulting from its incineration, should not exceed 1½ to 2%. The quantity, colour, &c., of the ash, will give an easy clue to the *inorganic adulterants*, if any are present, which may be then followed up by a chemical examination. The presence of *red lead* may be detected by heating it on a piece of charcoal in the reducing flame of the blowpipe, by which a small bead of metallic lead will be obtained. If it contains *chalk, ochre, gypsum*, &c., the undissolved residuum of the washed ash gives the amount of the adul
(nearly).

Uses, &c. To *colour varnishes* and l
as a *pigment* for painting velvet an
parencies; as a *colouring matter* fo
(1 *oz.* to 1 *cwt.* of curd), for which p
is not injurious, if pure; and as a
for cotton, silk, and wool, particul
second, to which it imparts a beautifu
yellow hue, the shade of which may
from 'aurora' to deep orange, b
different proportions of pearlash
water it is dissolved in, and by
different mordants before putting it
dye-bath, or different rinsing liquid
wards. The hues thus imparted are,
all more or less fugitive.

Annotta Cake. *Syn.* Flag annot
lea'na in fo'liis, L. From Cayenn
yellow, firm and soft to the touch; i
cakes, weighing 2 or 3 *lbs.* each.

Annotta Egg. *Syn.* Lump annot
lea'na in o'vulis, L. Generally inf

Annotta, Eng'lish. *Syn.* Trade a., R
a.; Orlea'na reduc'ta, L. A fr
mess commonly *prepared* from *egg*
annotta, gum tragacanth, flour or *faris*
soap, train-oil, Venetian red, or *bole,*
salt, water, mixed by heat in a copper
formed into rolls. Sold for genuine
from which it is readily distinguish
inferior quality, and its partial solu
alcohol.

Annotta, Liq'uid. See Solution o
ta (*below*).

Annotta, Pu''rified. See Orelline

Annotta Roll. *Syn.* Orlea'na in
O. in bac'ulis, L. From the Brazi
dry, brown outside, yellow within.
pure, this is the variety most estee
the one preferred for colouring chees

Annotta, Solu'tion of. *Syn.* Essenc
notta, Extract of a., Annotta-d
Solu'tio orlea'næ, Extrac'tum o.
A strong aqueous solution of equal
annotta and pearlash, the whole bein
or boiled together until the ingred
dissolved. Sold in bottles. See
(*above*), Nankeen Dye, &c.

AN'O-. [Gr.] In *composition*, upw
as in *anocathar'tic* (emetic). See An

AN'ODE. *Literally*, 'upward
electro-chemistry, the 'way in,' or
which the electric current is sup
enter substances through which i
as opposed to the CATHODE, or
which it goes out; the positive p
voltaic battery.

AN'ODYNE (-dīne). *Syn.* Ano'dyn
ŭs-), L.; Anodin, Fr.; Schmerzs
Ger. That allays pain; soothing; a

Anodynes. *Syn.* Ano'dyna (sing.
num), L.; Anodins, Remèdes a., Fr.
dicine and *pharmacy*, substances an
which allay pain. Some (as the par
act by actually assuaging pain; othe

by inducing sleep; whilst a third
cotics), give ease by stupefying the
by lessening the susceptibility to pain.
e principal anodynes are opium, mor-
bane, camphor, ether, chloroform,
drate, and other medicines of the
: to which must be added spirituous
ines, and the stronger varieties of
r. "The frequent use of anodynes
necessity of their continuance."
y.)

, **In'fantile** (-ïle). *Syn.* ANO'DYNUM
(-tïl-e), L. *Prep.* Take of *syrup*
, 1 *oz.*; *aniseed-water*, 3 *oz.*; *French*
oz. (or *rectified spirit*, ½ *oz.*); *cal-*
esia, ¼ *oz.*; mix. An excellent ano-
ntacid for infants.—*Dose.* A small
l as required.

'IA (-dïn'-y'ă). Freedom from
sthesis.

XY. *Syn.* ANOREX'IA, L.; ANO-
, Ger. In *pathology*, want of, or
iminished appetite, without loath-
. It is usually symptomatic of
tions. See APPETITE, DYSPEPSIA,

AGLIONE (-băl-y'ō'-nā). *Prep.* Put
aspoonfuls of *sugar*, and 2 small
sherry or *marsala*, into a chocolate
in *boiling water*, or over the fire,
he mixture rapidly stirred until it
rise and thicken a little; then add
poonfuls of *orange-flower water* or
, and serve it up in wine-glasses.
Italian domestic remedy for a

t). *Syn.* EMM'ET, PIS'MIRE*‡ (pïz'-);
L.; FOURMI, Fr.; AMEISE, Ger.;
. This well-known little insect
the family *formĭ''cidæ*, and the order
ra. Like the bee, it is a social
es in communities which may be
o well-regulated republics, and is of
—male, female, and neuter. Those
to the last alone labour and take
ova and young. The *red ant* con-
IC ACID (*acid of ants*), and a pe-
OUS OIL. Both of these may be
y maceration in *rectified spirit.* A
prepared, and flavoured with aro-
stitutes Hoffman's EAU DE MAGNA-
greatly esteemed as an aphro-

and *bicarbonates.* AMMONIA is one of the most powerful, and when the acidity is conjoined with nausea and faintness, or is accompanied with symptoms of nervous derangement or hysteria, is undoubtedly the best; when great irritability of the coats of the stomach exist, POTASH is to be preferred; when the acidity is accompanied with diarrhœa, *carbonate of lime* (prepared chalk), *lime-water*, or *Carrara-water*; and when with *costiveness*, MAGNESIA. They may all be advantageously combined with some simple aromatic, as *ginger*, *cinnamon*, or peppermint. Their *preparation*, *doses*, *administration*, &c., will be found under each in its alphabetical place; and *formulæ* containing them, under DRAUGHTS, LOZENGES, MIXTURES, &c.

ANTAL'GICS (-tăl'-). *Syn.* ANTAL'GICA, L. Medicines which relieve pain; anodynes.

ANTAL'KALINES (ănt-ăl'-kă-lïnz). *Syn.* ANTALKALI'NA, L. Agents or medicines which correct alkalinity. All the acids, except the carbonic, are antalkaline.

AN'TE-. In *composition*, before, contrary, opposite; generally in the *first* sense. See ANTI-.

ANTHELMIN'TICS, Anthelmin'thica (-thĕl-). See VERMIFUGES and WORMS.

AN'THIARINE (-ïn). See ANTIARINE.

ANTHOK'YAN. *Syn.* SUCC'US VI'OLÆ PREPARA'TUS, L. The expressed juice of the sweet or purple violet (vi'ola odora'ta—Linn.), defecated, gently heated in glass or earthenware to 192° Fahr., then skimmed, cooled, and filtered; a little rectified spirit is next added, and the following day the whole is again filtered. It must be kept well corked, and in a cool situation.

Uses, &c. Chiefly to make syrup of violets, to colour and flavour liqueurs, and as a chemical test. The London druggists obtain it principally from Lincolnshire.

AN'THONY'S FIRE, Saint (-to-nïz). See ERYSIPELAS.

AN'THOTYPE. See PHOTOGRAPHY.

AN'THRACINE (-sïn). Paranapthaline.

AN'THRACITE (-site). [Eng., Fr.] *Syn.* ANTHRAC'OLITE, GLANCE'-COAL, STONE'-COAL‡, MINERAL CHAR'COAL*; ANTHRACI'TES, L.; GLANZKOHLE, Ger. A species of coal found in the transition-rock formation, consisting chiefly of dense carbon. It has a conchoidal poker, it may be burnt in a common grate. The Americans use a little charcoal as kindle, and seldom supply fresh coal to the fire oftener than once or twice a day.

The inferior varieties of anthracite are technically and provincially called culm; as is also the small and waste of the better kinds.

For the *analysis*, *geology*, *calorific value*, &c., of anthracite, *see* Coal, Culm, Evaporation, Fuel, Heat, &c.

AN'THRACOKA'LI. [Eng., L.] *Syn.* Anthrakoka'li, Anthrak'ali; An'thracoka'li, Hamb. C. 1845. *Prep.* 1. (Polya.) Carbonate of potassa, 6 oz.; quick-lime, 3½ oz.; water, 4 pints; proceed as directed for 'liquor of potassa,' then evaporate the clear liquid, in an iron capsule, to about 6 fl. oz., add of finely powdered mineral coal, 5 oz., boil, with constant stirring, to dryness, and continue the stirring at a reduced heat, until the whole is converted into a homogeneous black powder, which must be at once placed in small, dry, and well-stoppered phials.

2. (Hamb. C. 1845; Ph. Baden. 1841.) Hydrate of potassa, 7 dr.; melt, add of kennel-coal, 5 dr., and then proceed as before.

Prop., &c. A deliquescent black powder, with a caustic taste, and empyreumatic smell; 10 grs. with 1 fl. oz. of water, after filtration, forms a clear, dark brown solution, giving a precipitate with acids, without effervescence. —*Dose.* 1 to 3 grs., twice or thrice daily; and externally, made into a pommade or ointment (¼ to 1 dr., to lard, 1 oz.); in skin diseases (particularly herpetic eruptions), scrofula, chronic rheumatism, &c. It has been highly extolled by Dr. Gibert, and by its inventor, Dr. Polya; but apparently undeservedly.

Anthracokali, Sul'phuretted. *Syn.* Anthracoka'li sulphure'tum, L. *Prep.* (Polya.) As formula 1 (*above*), but adding sulphur, 4 dr., immediately after stirring in the powdered coal.—*Dose*, *use*, &c., as the last. See Fuligokali.

ANTHRACOM'ETER. *Syn.* Anthracom'etrum, L.; Anthracomètre, Fr.; Kohlensäuremesser, Ger. An apparatus used to determine the heating power or commercial value of coal, or other fuel; also an instrument for finding the proportion of carbonic acid in any gaseous mixture.

ANTHYPNOT'ICS (-thĭp-). *Syn.* Antihypnot'ics (-hĭp-), &c. See Agripnotics.

AN'TI-. [Gr., ἀντι, against.] In *composition*, before, against, contrary to, corrective of, &c., more especially representing antagonism or opposition; whilst the Latin *ante-*, is generally used in the sense of before, having reference to precedence either of place or time.

Anti- is a common prefix in English words derived from the Greek and Latin, especially those connected with pharmacology and medicine, the final *i* being either dropped or *retained (but generally* the first) before a, e, *and h; as in antac'id* (-tăs'-), antibil'ious,
anti-emet'ic, anthelmin'tic, antisco
sep'tic, &c., whether used as a
substantives. These compounds, wl
numerous, are in general self-expl

AN'TIARINE (-ĭn; -ti'—Bran
Fr.] *Syn.* An'thiarine, Eng.,
ari'na, Anthiari'na, Antia"r
(-zh'ĭ), L. The active principle
poison of Java. It is extracted f
tially inspissated juice (upas-poi
upas-tree by alcohol, and may
under the form of small pearl
scales, by careful evaporation.—
3½ $\frac{0}{0}$ (Mulder).

Prop., &c. Soluble in 27 part
water; freely soluble in alcohol;
in ether; heat decomposes it. It i
poison, to which no antidote is kn
a minute quantity introduced in
rapidly brings on vomiting,
and death. "It renders the h
sible to the stimulus of the bloo
Brodie.)

ANTI-ATTRI"TION (-trĭsh'-).
Syn. Ax'le-grease, Friction c
bricating compound, &c. *Pr*
plumbago (black lead), finely po
sifted, so as to be perfectly free
gradually added, through a sieve, t
weight of good lard contained in
and rendered semi-fluid, but *not*
gentle heat; the mass being vigor
with a strong wooden spatula, af
dition, until the mixture is compl
composition smooth and uniform.
is then gradually raised until
liquefies, when the vessel is remov
fire to a cool situation, and the sti
should have been unremitted, cont
the mixture is quite cold. It is ap
cold state, with a brush, about
according to the velocity of the
is said to be fully 3-4ths che
than oil, tallow, tar, or any of t
compo's. When intended for use
will be exposed to warmth, and
waste by dripping, a part, or eve
of the lard is replaced by hard str
or tallow, or a little bees' wax is a
its manufacture.

2. *Black lead*, 1 part; *tallow*
parts; ground together until perfe
either with or without *camphor*, 3
cwt. Expired patent.

3. *Scotch soda*, 60 *lbs.*; *water*, 3
solve in a capacious boiler, add
hard tallow, of each 1¼ *cwt.*, and
drawn the heat, stir vigorously
until the mass is homogeneous
solidified. In hot weather the p
tallow is increased, and that of
diminished; in winter, the reverse
the axles of railway carriages
coarse purposes. For express tr
low is usually employed, irrespe
weather or season.

poured out or drawn off, so that the sediment may not be disturbed.

ANTIMO′′NIAL (-mōne′-y′ăl)[1]. [Eng., Fr.] *Syn.* ANTIMONIA′LIS, L. Pertaining to, composed of, or containing antimony. In *medicine* and *pharmacy*, applied to preparations or remedies (ANTIMO′′NIALS; ANTIMONIA′′LIA, L.) in which antimony, or one of its compounds, is the leading or characteristic ingredient.

ANTIMO′NIATED. *Syn.* ANTIMONIA′TUS, L. Mixed or impregnated with antimony; antimonial.

ANTIMON′IC ACID. *Syn.* ACIDUM ANTIMON′ICUM, L.; ACIDE ANTIMONIQUE, Fr.; ANTIMONSÄURE, Ger.

Prep. 1. Pure metallic antimony, in coarse powder, or small fragments, is digested in excess of concentrated nitric acid, until the oxidation and conversion is complete; the excess of nitric acid is then removed by evaporation nearly to dryness, and the residuum thrown into cold distilled water; after which the powder (ANTIMONIC ACID) is collected on a calico filter, washed with distilled water, and dried by a gentle heat. Pure.

2. *Metallic antimony* (in powder), 1 part; *powdered nitre*, 6 or 8 parts; are mixed and ignited or deflagrated in a silver crucible; the mass, when cold, is powdered; the excess of alkali washed out with hot water, and the residuum (ANTIMO′′NIATE OF POTAS′SIUM) decomposed with *hydrochloric acid*; lastly, the precipitate (ANTIMONIC ACID) is washed and dried as before.

That obtained by the first process is dibasic, and has the formula $H_2Sb_2O_6$, while that produced by the second process is tetrabasic, and has the formula $H_4Sb_2O_7$; the former is called simply *antimonic* acid, the latter *metantimonic acid.*

Prop. *Antimonic acid* is a soft white powder, sparingly soluble in water, reddens litmus, and is dissolved, even in the cold, by strong hydrochloric acid and by potash. The hydrochloric solution, mixed with a small quantity of water, yields, after a while, a precipitate of antimonic acid; but if diluted with a large quantity of water, it remains clear. Ammonia does not dissolve it in the cold. By heating with a large excess of caustic potash it is converted into metantimonic acid.

Metantimonic acid is more readily dissolved by acids than antimonic acid, and is dissolved by ammonia, after a while, even at ordinary temperatures. It is also perfectly soluble in a large quantity of water, and is precipitated therefrom by acids. It is very unstable, and easily changes into antimonic acid, even in water.

ANTIMONIC ANHYDRIDE (Sb_2O_5). *Syn.* ANTIMONIC OXIDE, ANHYDROUS ANTIMONIC ACID, PENTOXIDE OF ANTIMONY. Antimonic or metantimonic acid, heated to a temperature below redness loses water and yields the anhydride, Sb_2O_5. Antimonic anhydride is a
yellowish-white powder, tasteless
in water and acids. Boiled with
caustic potash, it is dissolved.
carbonate of potassium, carbonic
expelled, and a salt is produced
antimonic acid is precipitated by

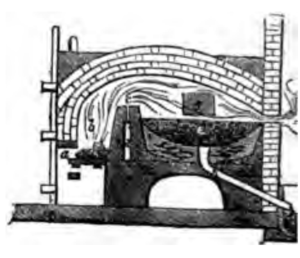
ANTIMONIOUS ACID. See
TETROXIDE of.

AN′TIMONETTED. *Syn.*
RETTED; ANTIMONIA′TUS, L. C
or containing antimony. See H

AN′TIMONY (-te-mŭn-e). *Syn.* M
TIMONY[2], REG′ULUS OF A.†; ANTI
METAL′LICUM, STIB′IUM, METAL′L
NII†, A. REG′ULUS†, &c., L.; ANT
ANTIMON, SPIESSGLANZ, SPIESSG
GLANZMETALL, Ger.; ANTIMON
The term formerly applied to th
phide or greyish-black semi-cr
of antimony; but now solely app
the pure metal.

Sources. Metallic antimony, in
with silver and iron (NATIVE ANTI
sulphur (GRAY SULPHIDE OF
nickel (NICKELIF′EROUS SULPHI
found in Bohemia, Hungary, Germ
France, England, Borneo, and Ame
idised, combined with oxide of iro
MO′′NIAL O′CHRE, RED ANTIMONY,
forming ores, either small in quanti
value, in various parts of the worl
the only one in sufficient abundance
is the common sulphuret, known
timony' or 'stibnite.'

Prep. Native antimony is fre
purities by fusion. The sulphide,
melted from the gangue, is comm
by exposure on the concave hea



(*a.*), (*b.*) Grate and fire-place.
(*c.*) Bridge.
(*d.*) Air-channel.
(*e.*) Concave space for ore, resting on a
formed of *sand* and *clay*.
(*g.*) Door for introducing the ore, a
residuary slag.
(*h.*) Pipe to convey away the liquid met
(*i.*) Chimney.

verberatory furnace, and is then
the metallic state by fusion in cr
coal-dust, crude tartar, or some
oxidising agent. To free the p
iron, it is generally fused, or re-f

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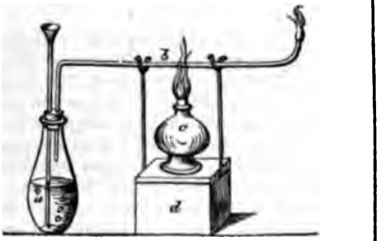
[1] *Antimon′ial (—Mayne)* is a barbarism.

[2] White A. occurs in considerable quant
and is used after roasting as a white pigm
other surfaces.

metallic antimony; the fumes and spots in both cases being insoluble in water, and in dilute solution of chloride (crude hypochlorite) of soda. On heating the centre of the tube to redness with a spirit lamp, the bluish-green colour of the flame lessens in intensity, and a mirror of metallic antimony, of silvery lustre, forms inside the tube at the ignited part. On passing dry sulphuretted hydrogen through the tube, still heated by a spirit lamp, this mirror assumes a reddish-yellow colour, approaching black in its thicker parts; and by exposure to a feeble stream of hydrochloric acid gas, almost immediately, or in a few seconds, disappears, being carried off by the gas, which, if passed into a little distilled water, yields a solution of chloride of antimony, which may be further submitted to any of the usual tests.[1] If the substance be in the solid state, it must be reduced to powder and dissolved in water; or if insoluble in that menstruum, a solution must be obtained by digestion in either hot hydrochloric or nitrohydrochloric acid, before proceeding to examine it by this method.



(*a*.) Flask containing the suspected fluid, dilute sulphuric acid, and zinc.
(*b*.) Small tube, at the one end having an almost capillary orifice, where the gas is inflamed.
(*c*.) Spirit-lamp.
(*d*.) Support.

Estim. Antimony is generally WEIGHED under the form of *tersulphide;* but sometimes as *antimonious anhydride*, and—though more seldom—as *pure metal*:—

1. A solution being obtained as above, if necessary, it is strongly acidulated with tartaric acid, and the antimony thrown down as a sulphide by a stream of sulphuretted hydrogen. After warming the solution and allowing it to cool, the precipitate (TERSULPHIDE) is collected on a filter, dried, and weighed. A small portion digested in strong hydrochloric acid, will completely dissolve if it be the pure sulphide; in which case the quantity of ANTIMONY sought will be equal to 71½ % (71·5%) of the weight of the sulphide found (very nearly).[2] Should only part of the precipitate be soluble, a known weight of it may be introduced into a flask, and a considerable quantity of fuming nitri
drop by drop, and afterwards, a
chloric acid, the mixture being d
gentle heat, until the reaction is e
the whole of the sulphur is dis
resulting solution diluted with wa
acidulated with tartaric acid, an
chloride of barium added as long
the liquid, yields a precipitate,
weight, after it has been thoroug
dried, and gently ignited, multip
gives the quantity of SULPHUR in
and which, deducted from the w
sulphide first found, gives the qua
ANTIMONY, as before.

2. The quantity of pure ANTIM
mercial samples may be determine
them (in powder) with nitric
oxidises the antimony and leaves
soluble state, whilst it dissolv
metals. The resulting oxide is
filter, washed, dried, ignited in a
lain crucible, and weighed—its
plied by ·7898 gives the quan
metal sought.

3. Dissolve a known weight of
hydrochloric acid, immerse a blac
tallic tin in the solution, and ke
acidulous, and in a state of gentle
the heat of a sand bath, when
the ANTIMONY will be precipitat
form of a black powder, and may
washed, dried, and weighed. Th
larly adapted to alloys of antim
See *Tests* (above) and *Pur.* (belo

Pur. The antimony of comme
contains a little arsenic, with va
ties of iron, lead, sulphur, and
impurities may be thus detected

1. (Arsenic.) By fusing the samp
mixed with about an equal weight
bitartrate of potassium, in a cover
2 or 3 hours, and placing the res
which is an alloy of antimony a
in a '*Marsh's apparatus*' along
water, when the disengagement
gas will commence, and may be
usual manner. See ARSENIC.

2. (Iron.) Dissolve the powde
nitrohydrochloric acid, dilute the
a large quantity of cold water,
a current of sulphuretted hydr
the filtrate as long as it prod
tate; again filter, boil the filter
few minutes to drive off the sul
drogen, and then test it with f
potassium, which will give a bl
if iron be present; or supersat
filtrate with ammonia, and the
sulphydrate of ammonium, whe
conditions, a black precipitate w

3. (Lead.) Digest the powde
hot nitric acid, which will dis
LEAD but leave the antimony
whitish powdery residuum ma
dried, ignited, and weighed, as a

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[1] See ARSENIOUS ACID.

[2] *Tersulphide of antimony* dried at 212° Fahr. still retains traces of water, which is not wholly expelled until *the heat reaches 390—392°, when it acquires a black colour and a crystalline appearance.*

sulphur, 4 parts; *crude antimony*, 3 parts; powder, mix, and calcine in a luted crucible for an hour. Emetic, resolvent, and alterative.—*Dose.* 1 to 6 grs.; in gout, rheumatism, scrofula, &c.

Antimony, Ce′ruse of. *Syn.* ANTIMO″NII CERUS′SA, L. *Prep.* (Bate.) As diaphoretic antimony (over which it possesses no advantage), merely using the metal instead of the sulphide.

An old preparation made by igniting *antimony* in the sun's rays, by means of a lens, was called ANTIMONII CERUSSA SOLA″RIS.

Antimony, Chlo″rides of (klōre′-īdz):—

1. **Antimony, Trichloride of.** $SbCl_3$. *Syn.* TERCHLORIDE OF ANTIMONY, ANTIMONIOUS CHLORIDE, CHLO″RIDE OF ANTIMONY, SESQUICHLORIDE OF A., BUTTER OF A., CAU′STIC ANTIMONY†, &c.; ANTIMO″NII CHLORI′DUM, A. TERCHLORI′DUM, A. BU′TYRUM*, &c., L.; CHLORURE D'ANTIMOINE, BEURRE D'ANTIMOINE, &c., Fr.; ANTIMON-CHLORID, SPIESSGLANZ-BUTTER, Ger. This is the substance of which common chloride, or butter of antimony, of the shops, is an impure concentrated solution containing free acid.

Prep. 1. SOLID, ANHYDROUS:—

a. Pure commercial *tersulphide of antimony*, in coarse powder, 1 part; *concentrated hydrochloric acid*, 5 parts; are mixed in a capacious stoneware or glass vessel set under a chimney with a quick draught, to convey away the fumes, the whole being constantly stirred, and, as the effervescence slackens, a gradually increasing gentle heat applied until solution is complete; the resulting liquid is put into a retort, and distilled, until each drop of the distillate, as it falls into the aqueous liquid which has previously passed over into the receiver, produces a copious white precipitate; the receiver is then changed, and the distillation continued, when pure TRICHLORIDE OF ANTIMONY passes over, and solidifies on cooling to a white and highly crystalline mass, which must be carefully excluded from the air.

b. From *pure metallic antimony*, 2 parts; *bichloride of mercury*, 5 parts; both in fine powder; mixed and distilled in a retort with a large neck, by a gentle sand-heat, into a suitable receiver. Chemically pure.

2. LIQUID:—

a. (LI′QUOR ANTIMO″NII CHLORI′DI, B. P.) *Syn.* SOLUTION OF CHLORIDE OF ANTIMONY.

Prep. Take of *black antimony*, 1 *lb.*; *hydrochloric acid*, 4 pints; place the black antimony in a porcelain vessel; pour upon it the hydrochloric acid, and, constantly stirring, apply to the mixture, beneath a flue with a good draught, a gentle heat, which must be gradually augmented as the evolution of gas begins to slacken, until the liquid boils. Maintain it at this temperature for fifteen minutes; then remove the vessel from the fire, and filter the liquid through calico into another vessel, returning what passes through first, that a perfectly clear solution may be obtained. Boil this down to the bulk of two pints, serve it in a stoppered bottle.

Characters and Tests. A heavy li ally of a yellowish-red colour. A li dropped into water gives a white p and the filtered solution lets fall a c posit on the addition of nitrate of the white precipitate formed by treated with sulphuretted hydrogen i orange-coloured. The specific gravi solution is 1·47. One fluid drachm e with a solution of a quarter of an ou taric acid in four fluid ounces of wa a clear solution, which, if treated wit retted hydrogen, gives an orange p weighing, when washed and dried a least 22 grains.

b. (Commercial.)—*a.* Take of *ash antimony*, 3½ *lbs.*; *common salt*, 2 *lb vitriol*, 1½ *lb.*; *water*, 1 *lb.*; proceed *Prod.*, 2½ *lbs.*

c. From *roasted sulphide* or *glas mony*, 7 *lbs.*; *salt*, 28 *lbs.*; *oil of lbs.*; *water* 14 *lbs.*; as before.

d. From *crude sulphide of antim* dered), 25 *lbs.*; *strongest commerc chloric acid*, 1 *cwt.*; *nitric acid*, 3 before; the product being colour little *pernitrate of iron*, and made sp. gr. 1·4. The quality is improve process more easily conducted, if the mony is roasted *before* dissolving acid. The same applies to the othe

Prop., *&c.*—*a.* SOLID. When *nearly free* from *water*, it somewh bles butter, melts with a gentle heat tially crystallises on cooling; is very cent, and quickly passes into an when exposed to damp air; ve in strong hydrochloric acid; water, to its quantity, more or less deco When *perfectly pure* and *anhydrou* a white and highly crystalline ma decomposed by air and moisture.— TION. The sp. gr. of the solution of varies from 1·25 to 1·4, in which s transparent fuming yellow liquid (u artificially coloured), and extremely caustic. Submitted to distillation, parts with its water and excess of which the salt itself is volatilised. ing the receiver as soon as the dist cretes on cooling, or produces a cop precipitate on falling into the liqu passed over, the *pure* ANHYDROUS RIDE may be readily obtained.

Phys. eff., *Ant.*, *Lesions*, *&c.* See A

Uses. In *medicine*, only *extern* chiefly as a caustic or escharotic to t caused by rabid and venomous ani to repress excessive granulations in u *pharmacy*, as a source of both o and oxide of antimony. The residu retort when corrosive sublimate is u phide of mercury, and was forme CINNABAR OF ANTIMONY.

ANTIMO′′NII VIT′RUM, ANTIMO′′NIUM VITRIFICA′TUM, A. VITRIFAC′TUM (Ph. L. 1788), OX′YDUM. ANTIMONII VITRIFICATUM, &c., L.; VERRE D'ANTIMOINE, OXYSULFURE D'ANTIMOINE SILICATÉ, Fr. *Prep.* (Ph. L. 1788.) Roast *sulphide of antimony* in a shallow earthen vessel, over a moderate fire, stirring it constantly with an iron rod, until it turns whitish-grey and ceases to emit fumes at a red heat; put the residuum into a covered crucible which it shall only two thirds fill, and expose it to an intense heat (gradually raised), until it fuses, then pour it out on an iron plate. If calcined too much, a little more crude antimony may be added to make it run well.

Comp., Prop., &c. A mixture of sulphide and oxide of antimony contaminated with a little silica and iron. In fine powder it is emetic, in doses of 1 to 3 grs.; but owing to the uncertainty and violence of its operation, is now seldom employed. It has been used as a cheap source of the TEROXIDE by the manufacturers of tartar emetic.

Antimony, Glass of (Cera′′ted). *Syn.* ANTIMO′′NII VIT′RUM CERA′TUM, L. *Prep.* (Dr. Young & Ph. L. 1746.) *Glass of antimony*, in very fine powder, 1 oz.; *yellow wax*, 1 dr.; melt together in an iron ladle, and keep it over a gentle fire free from flame, (constantly stirring,) for about half an hour, or until it acquires a snuff colour, then pour it out on a piece of white paper (or a plate), and when cold, powder it.—*Dose.* 2 to 10 grs., in dysentery, &c.

Antimony, Li′ver of. *Syn.* HE′PAR ANTIMO′′NII, L.; HÉPAR D'ANTIMOINE, OXYSULFURE D'ANTIMOINE SILICATÉ, Fr. *Prep.* From *sulphide of antimony*, 1 part; and *dry carbonate of sodium* or *potassium*, 2 parts; melted together, and heated until it acquires the proper colour, and then cooled, and powdered.

Comp., Uses, &c. A mixture of trioxide of antimony, sulphide of potassium, carbonate of potassium, and undecomposed trisulphide of antimony. It is chiefly *used* by *farriers*, in *doses* of 1 to 2 drs., as an alterative purge for horses, in greasy heels, &c.; and sometimes by *chemists*, as a source of the crude oxide. Crocus of antimony, before noticed, sometimes passes under the name, and is sold for it.

Antimony, Ore of. *Syn.* ANTIMONY-ORE. Native sulphide of antimony.

Antimony, Oxide of. The B. P. name for Antimony, Trioxide of (which *see*).

Antimony, Oxides of. Antimony forms with oxygen three definite compounds, viz. the—

Trioxide or antimonious oxide . . . . Sb_2O_3
Tetroxide or antimonoso-antimonic oxide . . Sb_2O_4 $\left\{ \begin{matrix} \text{or} \\ Sb_2O_3. \\ Sb_2O_5 \end{matrix} \right.$
Pentoxide or antimonic *oxide* . . . . Sb_2O_5

Antimony, Trioxide of. Sb_2O_3.
OXIDE OF ANTIMONY, ANTIMONI
(B. P. OXIDE OF ANTIMONY, E
MONII OXIDUM, L.). *Prep.* (B. I
solution of chloride of antimony, 1
carbonate of soda, 6 *oz.*; *water*, 2
tilled water, a sufficiency. Pour th
solution into the water, mix tho
the precipitate settle, remove the
liquid by a siphon, add one gallon
water, agitate well, let the precipit
again withdraw the fluid, and rep
cesses of affusion of distilled wate
and subsidence. Add now the c
soda previously dissolved in two p
tilled water, leave them in contact
hour, stirring frequently, collect th
a calico filter, and wash with boil
water until the washings cease to
cipitate with a solution of nitra
acidulated by nitric acid. Lastly,
duct at a heat not exceeding 212°.

Char. & Tests. A greyish-wh
fusible at a low red heat, insolub
but readily dissolved by hydrochlo
solution, dropped into distilled w
white deposit, at once changed t
sulphuretted hydrogen. It disso
when boiled with an excess of the
of potash.

Uses. Chiefly in making tartar
some other salts of antimony; als
paration of *pulvis antimonialis.*
tically, it is a diaphoretic and febri
1 to 4 grains.

Antimony, Pentoxide of. See
ANHYDRIDE.

Antimony, Tetroxide of. Sb_2O_4 or
Syn. ANTIMONOSO-ANTIMONIC O
MONIOUS ACID. Found natural
or *Antimony-ochre.* Prepared by
monic anhydride, by roasting th
trisulphide, or by the action of ex
acid on finely powdered metalli
Thus prepared, it is a white solid
by heat; slightly soluble in water
hydrochloric acid.

Antimony, Oxychoride of. S
POWDER OF ALGAROTH. Throw
white precipitate when trichloride
is poured into water. Contin
with water deprives it of nearly
its chlorine, and converts it into
a change which is more complete
aqueous solutions of the alkalies
bonates.

Antimony, Oxysulphide of. Th
$Sb_2O_3 . 2Sb_2S_3$ occurs native as r
Antimony blende, Kermesome,
glanzerz, Crocus of antimony, G
mony, and similar preparations, ar
some authorities to be crude ox
antimony.

Antimony, Red. See OXYSULP
TIMONY, before noticed.

Antimony, Reg′ulus of. Sy

and grooms frequently mix a little of it with the food of horses to improve their coat and promote their 'condition.'—*Dose*, for a *horse*, 1 to 4 *drs.*, in fine powder, often combined with nitre and sulphur; for CATTLE, ½ to 1 *oz.*, or even 1½ *oz.*; DOGS, 5 or 6 to 20 or 30 grs.; HOGS, 20 to 30 grs., twice or thrice daily. According to Dr. Paris, it is one of the ingredients in *Spilsbury's Drops*. It is also an ingredient in *Tisane de Feltz*.

Antimony, Tartarated. $KSbOC_4H_4O_6 \cdot Aq$. *Syn.* TARTARIZED ANTIMONY, TARTAR EMETIC, EMETIC TARTAR, POTASSIO-TARTRATE OF ANTIMONY, Eng.; ANTIMONIUM TARTARATUM, B.P. *Prep.* Various methods have been devised for the preparation of this compound, but the following, which is taken from the 'British Pharmacopœia,' is to be preferred:—

Take of *oxide of antimony* 5 *oz.*, *acid tartrate of potash*, in fine powder, 6 *oz.*, *distilled water*, 2 pints. Mix the oxide of antimony and acid tartrate of potash with sufficient distilled water to form a paste, and set aside for 24 hours. Then add the remainder of the water, and boil for a quarter of an hour, stirring frequently. Filter, and set aside the clear filtrate to crystallise. Pour off the mother-liquor, evaporate to one third, and set aside, that more crystals may form. Dry the crystals on filtering paper at the temperature of the air.

Char. and Tests. In colourless transparent crystals exhibiting triangular facets, soluble in water, and less so in proof spirit. It decrepitates and blackens upon the application of heat. Its solution in water gives with hydrochloric acid a white precipitate, soluble in excess, and which is not formed if tartaric acid be previously added. Twenty grains dissolve without residue in a fluid ounce of distilled water at 60°, and the solution gives with sulphuretted hydrogen an orange precipitate which, when washed and dried at 212°, weighs 9·91 grains.

Phys. eff., Doses, &c. Externally, tartar emetic acts as a powerful local irritant, causing a pustular eruption, which permanently marks the skin; for this purpose it is used in the form of solution, ointment, or plaster. *Internally*, in small doses ($\frac{1}{16}$ to ⅛, or even ⅙ gr.), it acts as a diaphoretic and expectorant; in somewhat larger doses (⅙ to ½ gr.), it excites nausea, and sometimes vomiting, occasioning depression and relaxation, especially of the muscular fibre; in larger doses (1 to 2 or 3 grs.), it acts as an emetic and sudorific (and often as a purge), depressing the nervous functions, and producing a feeling of feebleness, exhaustion, and relaxation, greater than that caused by other emetics; in certain doses (½ to 3, or even 4 grs.), it is used as a sedative and antiphlogistic, to reduce the force of the circulation, &c.; in excessive doses, it acts as an irritant poison, and has in some instances caused death; and even small doses frequently administered, and long continued, have brought

on a state of weakness, prostrati
distaste for food, which has le
fatal termination. It is usually
dissolved in distilled water, eith
or without the addition of a littl
syrup. In acute rheumatism, inflam
the lungs or pleura, chorea, hydro
and apoplexy, it is *said* to have been
doses of 2 to 4, or even 6 grs., with a
by Laennec, Rasori, and others; but
treme doses are not always safe, a
be commendable when smaller ones (
repeated every two hours) appear
beneficial, and distress the patient
doses of ½ gr. to ¾ gr. each, combi
calomel, it is a powerful and excelle
tive in acute rheumatism and many
eases. Of all our sudorifics it is, pe
most valuable, and the one most
available. Triturated with 16 to 20
weight of *sulphate of potassa*, it
excellent SUBSTITUTE for *antimonia*
and *James's powder*, as a diaphoretic
of 2 to 4 grs.

Whenever much gastric or intes
tation is present, *tartar emetic*
avoided, or very *cautiously* administ
then combined with an opiate, or s
sedative. It should also be given wi
to children; as, according to Messrs
and Noble, even in small doses it
acts as a poison on them.

In *veterinary medicine*, it is em
promote diaphoresis and expectorati
reduce arterial action, particularly
and catarrhal affections, the *dose* f
being 20 grs. to 1 dr., or even oc
1½ dr., in gruel, thrice daily; also
as a diuretic and vermifuge, in *dos*
2 drs., combined with tin-filings, f
successive days, followed by a purge
The usual *dose* for CATTLE is 20 grs
SHEEP, 5 or 6 to 20 grs.; SWINE (ch
emetic), 2 to 5 or 6 grs.; DOGS (chi
emetic), 1 to 3 grs. It is sometime
seldom, used *externally*, as a counte
in chest affections, &c.; but its en
thus requires caution.

Pois., &c. That from large doses
already noticed under ANTIMONY (v
In *poisoning*, the *treatment* is the en
of all antimonials, followed by toni
nutritious diet, the use of lemon-jui
fruit, a little wine, warm baths, an
storatives generally.

Antimony, Tar'tarised. See ANTIM
TARATED.

Antimony, Vit'rified. See GLASS
MONY.

ANTIPHLOGIS'TIC (-flo-jĭs'-). *S*
PHLOGIS'TICUS, L.; ANTIPHLOGISTI

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[1] "In consequence of the violent vomit
might be added—prostration) "which (eve
sometimes produced, I have found patients *po*
to *continue* the use of the medicine." Per
M. M.;" 4th ed., i, 752.

ing bees have a sting. The *honey* or *hive bee* is distinguished from the other species of this genus by having the femora of the posterior pair of legs furnished with a smooth and concave plate on the outer side, and fringed with hair, forming a basket or pocket for the reception and conveyance of the pollen of plants; and also in being destitute of spines at the extremity. The Linnæan genus includes nearly 60 species. See BEES.

Apis Mellif'ica. [Linn.] The honey-bee.

APLANAT'IC. In *optics*, applied as an epithet to lenses, of which the figure, as well as the materials of which they are composed, are such that, with a given index of refraction, the amount of aberration, both chromatic and spherical, is insignificant, or the least that can possibly be obtained. See ABERRATION, ACHROMATISM, LENS, &c.

APO-, [Gr.] In *composition*, from; denoting derivation, separation, opposition, or departure. It is a common prefix in words from the Greek, and is etymologically the same as the Latin *ab-*.

APOC'YNINE (-pŏs'-e-nĭn). *Syn.* APOCYNI'NA, L. A bitter, crystallisable substance, found in *apŏ''cynum cannabi'num* (Linn.), or the Indian hemp of North America. See ALKALOID.

AP'OPLEXY (-plĕks-e). *Syn.* APOPLEX'IA, APOPLEX'IS, L. (from *απὸ-πλήσσω*, *I astound* or *strike down*, Gr.); APOPLEXIE, Fr.; SCHLAGFLUSS, Ger. A disease so named on account of the suddenness and violence of its attacks.

Symp. Sudden suspension or loss of the powers of sense and motion; the heart continuing to beat and the lungs to act, but generally with difficulty. During the fit the patient usually lies in a state resembling sleep, or the stupor induced by drunkenness. In some cases there is paralysis of one side of the body, and convulsions of the other. In the *sanguineous* or *sthenic variety*, or the one which is most common, the pulse is hard and full, the countenance flushed and bloated, and the breathing stertorous; in the *serous* or *asthenic* variety, the pulse is feeble, the skin cold, and the countenance pale. "The presence of convulsions is indicative of great danger." (Dr. Cheyne.) In both cases the patient is generally found lying on his back, in a state of complete insensibility, which defies every effort to arouse him; the eyelids almost cover the eyes, which are fixed and devoid of intelligence, whilst the pupils scarcely change their dimensions under the varying influence of light and darkness; the lips are usually purple or very dark; and both the lips and nostrils have generally a slight trembling movement communicated to them by the deep and laborious breathing of the patient.

Treat. In this disease, more than perhaps any other, medical aid should be *immediately* sought. In the mean time the patient should *be placed in an easy posture*, in a well-ventilated apartment, and in the *sang*
sthenic variety, in as erect a positi
sible; but in the *asthenic* variety, wh
is pale, with the head and shoulders
rately elevated. The neckcloth sho
moved, and the clothes loosened, and
and neck laid bare. Crowding
patient should be particularly avoid
free exposure to fresh air secured
possible way. When medical aid
immediately procured, blood should
taken (say 15 to 20 fl. oz., or more)
arm, by any person competent to do
the face be pale, and the pulse fe
cupping at the back of the neck,
behind the ears, should be substitut
dinary bleeding. Cold water should
on the head, the legs placed in pr
water, and blisters or mustard poulti
between the shoulders. In the m
or 10 grs. of calomel may be adr
and its action subsequently promot
use of saline purgatives and stimul
ters. When there is a difficulty of s
a couple of drops of *croton oil* may
to the tongue; or it may be poured
before placing it in the mouth. I
mode of relieving the bowels should
in all extreme cases, as soon a
Emetics should be *carefully* avoi
only exception to this rule is, when t
is distended by a heavy undigested m
an emetic is hazarded as the less of
Nasal stimulants, as smelling salts o
vinegar, should also be avoided. If
ing has not afforded some relief,
repeated in from 3 to 5 hours. W
means prove successful, the remain
treatment may consist in the adm
of mild purgatives and diaphoretic
avoidance of stimulating food or d
of other like exciting agents.

Prev., *&c.* The premonitory sy
apoplexy are *giddiness*, *pain* and *su*
the head, *loss of memory*, *faltering i*
using one word for another, *dimin*
sibility either of body or mind, or b
siness, *noises in the ears*, *specks floa*
the eyes, *nightmare*, *frightful dreams*
respiration, *heavy* yet *unrefreshing s*
clination to *sigh* without any mo
cramp in the legs at night when t
irritation of the bowels to account fo
&c. When any of these symptoms
pecially in "free livers") aperient
and a light diet should be at once ha
to, and wine, beer, and spirits, avoi
most dangerous poisons. If the
increase or continue, active purgati
lower diet, and even bleeding ma
recourse to. Pure air, early risin
habits, gentle muscular exercise, and
clothing, are powerful preventives of
By attending to the admonitions
and adopting the simple means
within the reach of all, it is indisp

condition, constitute DEFECTIVE *or* DISEASED APPETITE.

Deficiency or *loss of appetite* (AN'OREXY); ANOREX'IA, L.) generally arises from disordered stomach; but is also frequently symptomatic of other affections, particularly dyspepsia, biliousness, feverishness, and organic diseases of the lungs, stomach, and primæ viæ, It is a common consequence of sedentary life, and of extreme mental anxiety, excitement, or exhaustion. The *treatment* will necessarily vary with the cause. In simple spontaneous cases, the appetite may generally be improved by out-door exercise, and the occasional use of mild aperients, especially salines and aloetics. When the affection arises from the stomach being loaded with bile and crudities, an emetic in the evening, followed by a stomachic purgative the next morning, with an occasional aperient afterwards, will seldom fail to effect a cure. With heavy drinkers, a gradual reduction of the quantity of the strong liquors usually consumed, is generally followed by a restoration of the appetite and digestive powers. The change thus gradually effected in the course of 8 or 10 days is often almost magical. The excessive use of liquors—especially of spirits, wine, or beer, or even of warm weak ones, as tea, coffee, soup, &c.—is always prejudicial. Hence drunkards are particularly subject to defective appetite; and teetotallers and water-drinkers to a heartiness often almost approaching voracity. See BILIOUSNESS, DYSPEPSIA, &c.

Depraved appetite (PI'CA, L.), or a desire for unnatural food, as chalk, cinders, dirt, soap, tallow, &c., when an idiopathic affection or depending on vicious tastes or habits (as is often the case in childhood), may be treated by admixing very small doses of tartar emetic or ipecacuanha with the objectionable food or articles. When symptomatic of pregnancy, a plentiful and nutritious diet, including the red meats, with a little good malt liquor or wine, may be adopted with advantage. When symptomatic of chlorosis, to this diet may be added, the use of chalybeate tonics, and sea or tepid bathing; when of dyspepsia, a light diet, bitter tonics, free exercise, fresh air, and cold bathing, will generally effect a cure.

Insatiable appetite (CANINE APPETITE, VORACITY; BULIM'IA, L.) is generally symptomatic of pregnancy, or worms, or diseases of the stomach or the viscera immediately connected with it; but sometimes exists as a separate disease, and is even said to be occasionally hereditary. When it occurs in *childhood*, worms may be suspected, and vermifuges administered. In *adults*, a common cause is imperfect digestion, arising from stomach complaints or gluttony, when the languor and gnawing pains of disease are mistaken for hunger. In this case, the diet should be regulated and the bowels kept gently relaxed with mild aperients, and tonics (as bark and steel), or bitters (as orange-peel and gentian), may be administered. When *pregnancy* or *habits* are the cause, the treatment i under DEPRAVED APPETITE may be When the affection is occasioned by the *stomach*, an emetic, followed by the rate use of absorbents or antacids, will rally effect a cure. In those cases dep on a *highly increased power* of the *sto* effecting rapid and complete digesti contractile force and morbid activity often allayed by the copious use of fat meat, &c., by the cautious use of op by the use or, freer use, of tobacco (smoked or chewed, or both). A ca daily, with a dose of blue-pill, or mer powder, every second or third day, is often advantageous. 25 or 30 drops of of potassa, in broth, twice or thrice daily, also been recommended. See BILIOU DYSPEPSIA, WORMS, &c.

APP'LE (ăp'l). *Syn.* MA'LUM, PO'MUM, POMME, Fr.; APFEL, Ger.; APPEL, D APLE, Swed. This well-known fruit is product of the cultivated varieties of *py ma'lus* (Linn.), or the *crab-apple* of our hed a tree of the *nat. ord.* Rosaceæ. The da its amelioration from the wild state is prob very remote, as several kinds are noticed Pliny in a manner that would lead to inference of a high antiquity. Pippins 'seedling improved apples,' are said to been introduced into this country from South of Europe towards the end of the century. Don enumerated 1400 varieti the cultivated apple; there are now prob above 1650. *Rennet apples* (PO'MA RENET are those ordered in the P. Cod. to be use pharmacy. In *botany* and *composition*, term *apple* (POMUM) is used to designate large, round, fleshy fruit, consisting of a ' carp,' enclosing a tough 'capsule' contai several seeds; as *love-apple*, *pine-apple*, &

The *wood* of the apple-tree is much use turnery; that of the crab-tree is gene preferred by mill-wrights for the teet mortise-wheels.

The *expressed juice* of 1 *cwt.* of ripe ap after the free acid has been saturated chalk, yields from 11 to 13 *lbs.* of a very sw but uncrystallisable sugar.

Love'-apple‡. The tomato.

Mad'-apple‡. The larger *Mecca* or *sorah gall.* They are also called DEAD APPLES, A. OF SODOM, &c. See GALLS.

Acid of Apples. Malic acid.

A'PRICOT. *Syn.* A'PRICOCK†; ARMENI'A MA'LUM, PRÆCO'TIUM, L.; ABRICOT, Fr.; A KOSE, Ger. The fruit of *armeni'aca vulg* (Lamb.; *pru'nus armeniaca*, Linn.), a rosac tree indigenous in Armenia, Cachmere, and now cultivated in every temperate re of the world. Under the name of *præco* was known in Italy in the time of Dioscori but it was not introduced into England the reign of Henry VIII (A.D. 1540). cultivation has since been zealously atte light yellow, almost inodorous, or with a faint smell, and bland taste. Sp. gr. 0·916.—*Prop. and Uses.* This oil affords a cheap and excellent substitute for olive oil for pharmaceutical and other purposes.

ARA'TION*. In *agriculture*, ploughing; culture by ploughing; tillage. Lands in a 'state of aration' are those under tillage.

AR'BOR. [L.] A tree. The *seventh* family of vegetables in Linnæus's system. In *anatomy* and *chemistry*, a term formerly applied to membranes and substances having some real or fancied resemblance to a tree or vegetation. An *ar'boret* is a little tree; an *arborist*, or *ar'borātor*†, is one who studies or cultivates trees.

ARCA'NUM. [L.] *Syn.* ARCANE, Fr.; GEHEIMNIS, Ger. A secret. In *alchemy*, a term applied to various preparations without any precise meaning. "Arcanum is a thing secret, incorporeal, and immortal, which can only be known to man by experience; for it is the *virtue* of each thing, which operates a thousand times more than the thing itself." (Ruland.) in *ancient medicine* and *pharmacy*, a nostrum. The word is still occasionally used in the plural (ARCA'NA, secrets, mysteries,) in the titles of books; as, '*Arcana of Chemistry*,' a book professing to contain a full exposition of the mysteries of that art.

Among the *old chemists*, ARCANUM AL'BUM was 'pulvis Viennensis albus virgineus' (see POWDERS); A. BEC'CHICUM, a sweetened aqueous solution of liver of sulphur; A. CORALLI'NUM, *nitric-oxide of mercury* that had been digested in a *solution of potash*, washed with *water*, and then had *spirit of wine* burnt on it (once a favourite mercurial and escharotic); A. DUPLICA'TUM, sulphate of potash; A. D. CATHOL'ICUM, roots of *colchicum* and *plantain* (worn as an amulet against fevers and pestilential diseases; A. LUDEMAN'NI, oxide of zinc; A. TAR'TARI, acetate of potassa; A. VI'TÆ, elixir vitæ; &c.

ARCHE'US (-kē'-ŭs; ăr'*—Mayne). [L.] *Syn.* ARCHÆ'US, L. A term invented by Paracelsus, and employed by the alchemists and older physicians, to imply the occult cause of phenomena, as well as the sub-causes or agents by which the effects were accomplished. Van Helmont and Stahl ascribe certain vital functions to the influence and superintendence of a '*spiritus archæus*' or intelligent vital principle. According to others, the powers of '*Archæus*' were indefinitely extended. He or it was an occult power of nature, the artificer of all things, physician-general to the universe, &c. &c., to the utmost bounds of absurdity and confusion.

From this word comes the *adj.* ARCHE'AL or ARCHÆ'AL, hidden, operative.

ARCH'IL (artsh'-ĭl). *Syn.* ARCH'EL*, OR'CHIL; ARCHIL'LA, ORCHIL'LA (*ch* as *k*), L.; ORSEILLE, Fr., Ger.; ORICELLO, It. A violet-red, purple, or blue colouring matter or dye-stuff, obtained from several species of lichens, but of the finest quality fro
tinctoria (DC.), and next from *r.*
(DC.).

The *archil* of *commerce* is met
liquid paste, or as a thin *liquid dye*
more or less intensity. The ordina
orchil of the shops (ORCHIL-LIQUO
the last form; and is known as e
OR RED ARCHIL—distinctions whi
follows:—

Prep. 1. BLUE ARCHIL:—The
coarsely ground lichen is steeped for
in a mixture of *stale urine*, or *bone*
lime or *milk of lime*, or in any sim
niacal solution, contained in *cover*
vessels in the *cold;* the process bein
until all the colour is extracted.

2. RED *or* CRIMSON ARCHIL:—Th
are the same as for the last variety,
less *milk of lime* is used, and the
generally made in earthen jars p
room heated by steam, technicall
stove. The two kinds merely dif
degree of their red or violet tin
dition of a small quantity of lim
to the one, or of an acid to the
mediately bringing them both to
shade of colour.

Prop. Archil has a disagreeable
moniacal odour. Its colouring m
luble in water, alcohol, urine, amm
alkaline lyes, and weak acid liquo
turn it *blue*, acids *red;* alum give
brownish-red precipitate, and soluti
red one; the alcoholic solution gra
its colour when excluded from th
colouring matter consists chiefly of

Pur. Archil is frequently adult
extract of *logwood*, or of *Lima* or *S*
It may be tested as follows:—1. A
50 or 60 drops of *pure archil* in ab
of water slightly acidulated with
almost entirely loses its colour,
only a yellowish tinge, when heate
lition in a flask along with 50 drop
solution of protochloride of tin m
part of the salt to 2 parts of wat
drop of fluid extract of logwood tre
same way, gives a distinct violet
resists several hours' boiling; but w
or 4 per cent. of logwood is present
liquid has a permanent grey tint:-
boiled liquid retains its red hue,
Sapan-wood is present:—4. The bo
when the archil is pure, re-acquires
by exposure to the air, and the add
alkali, particularly ammonia; whilst
produced by logwood is destroyed
alkaline solution of tin, and is r
acids.

Uses, &c. It is employed to ting
used to fill the tubes of thermomet
stain paper, wood, &c. The aqueo
stains MARBLE, in the cold, of a beau
colour, of considerable permanence
exposed to a vivid light. "Marble t

I.—Corresponding DEGREES of BAUMÉ'S AREOMETERS and REAL SPECIFIC GRAVITIES

1. *Areometer for liquids* LIGHTER *than* WATER, or *Pèse-esprit.*[1]

Degrees Baumé.	Specific Gravity.	Degrees Baumé.	Specific Gravity.	Degrees Baumé.	Specific Gravity.	Degrees Baumé.	Specific Gravity.	Degrees Baumé.	Specific Gravity.
10	1·0000	21	0·9300	32	0·8690	42	0·8202	52	0·77
11	0·9932	22	0·9241	33	0·8639	43	0·8156	53	0·77
12	0·9865	23	0·9183	34	0·8588	44	0·8111	54	0·76
13	0·9799	24	0·9125	35	0·8538	45	0·8066	55	0·76
14	0·9733	25	0·9068	36	0·8488	46	0·8022	56	0·76
15	0·9669	26	0·9012	37	0·8439	47	0·7978	57	0·75
16	0·9605	27	0·8957	38	0·8391	48	0·7935	58	0·75
17	0·9542	28	0·8902	39	0·8343	49	0·7892	59	0·74
18	0·9480	29	0·8848	40	0·8295	50	0·7849	60	0·74
19	0·9420	30	0·8795	41	0·8249	51	0·7807	61	0·741
20	0·9359	31	0·8742						

2. *Areometer for liquids* HEAVIER *than* WATER; *Pèse-acide*, or *Pèse-sirop.*[1]

Degrees Baumé.	Specific Gravity.	Degrees Baumé.	Specific Gravity.	Degrees Baumé.	Specific Gravity.	Degrees Baumé.	Specific Gravity.	Degrees Baumé.	Specific Gravity.
0	1·0000	16	1·1176	32	1·2667	47	1·4476	62	1·6889
1	1·0066	17	1·1259	33	1·2773	48	1·4615	63	1·7079
2	1·0133	18	1·1343	34	1·2881	49	1·4758	64	1·7278
3	1·0201	19	1·1428	35	1·2992	50	1·4902	65	1·7471
4	1·0270	20	1·1515	36	1·3103	51	1·5051	66	1·7674
5	1·0340	21	1·1603	37	1·3217	52	1·5200	67	1·7882
6	1·0411	22	1·1692	38	1·3333	53	1·5353	68	1·8096
7	1·0483	23	1·1783	39	1·3451	54	1·5510	69	1·8312
8	1·0556	24	1·1875	40	1·3571	55	1·5671	70	1·8537
9	1·0630	25	1·1968	41	1·3694	56	1·5833	71	1·8765
10	1·0704	26	1·2063	42	1·3818	57	1·6000	72	1·9000
11	1·0780	27	1·2160	43	1·3945	58	1·6170	73	1·9241
12	1·0857	28	1·2258	44	1·4074	59	1·6344	74	1·9487
13	1·0935	29	1·2358	45	1·4206	60	1·6522	75	1·9740
14	1·1014	30	1·2459	46	1·4339	61	1·6705	76	2·0000
15	1·1095	31	1·2562						

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[1] These instruments were originally adjusted at the temperature of 12½° Cent., or 54½° Fahr. Those now France are adjusted at 15° C., or 59° F.; and those made in England, at either 59° or (more usually) 60° Fahr. standard temperature of the instrument must be known for its correct application.

II.—*Corresponding* SPECIFIC GRAVITIES *and* DEGREES *of* BEAUMÉ'S AREOMETER *for* *liquids.*[1] From the Batavian Pharmacopœia.

Degrees Baumé.	Specific Gravity.	Degrees Baumé.	Specific Gravity.	Degrees Baumé.	Specific Gravity.	Degrees Baumé.	Specific Gravity.	Degrees Baumé.	Specific Gravity.
0	1000	16	1125	32	1286	47	1485	62	1758
1	1007	17	1134	33	1298	48	1501	63	1779
2	1014	18	1143	34	1309	49	1516	64	1801
3	1022	19	1152	35	1321	50	1532	65	1823
4	1029	20	1161	36	1334	51	1549	66	1847
5	1036	21	1171	37	1346	52	1566	67	1872
6	1044	22	1180	38	1359	53	1583	68	1897
7	1052	23	1190	39	1372	54	1601	69	1921
8	1060	24	1199	40	1384	55	1618	70	1946
9	1067	25	1210	41	1398	56	1637	71	1974
10	1075	26	1221	42	1412	57	1656	72	2000
11	1083	27	1231	43	1426	58	1676	73	2031
12	1091	28	1242	44	1440	59	1695	74	2059
13	1100	29	1252	45	1454	60	1715	75	2087
14	1108	30	1261	46	1470	61	1736	76	2116
15	1116	31	1275						

Aromatic. In *medicine, pharmacy, perfumery*, &c., applied to substances, simple or compound, characterised by an agreeable odour or carminative properties, or both; as *aromatic confection, a. pastilles, a. vinegar, a. bark* (CORTEX AROMATICUS, white canella), &c.

ARQUEBUSADE' (ar-ke-bŏŏ-zade'). [Fr.] *Primarily*, the shot of an arquebuse; but afterwards applied to an aromatic spirit (EAU D'ARQUEBUSADE, Fr.), originally employed as an application to gunshot (arquebuse) wounds.

AR'RACK (*arrack'*—Brande). [Ind.] *Syn.* ARAC, ARACK, RACK‡§; PALM-SPIRIT; ARRAC'CA, SPIR'ITUS PAL'MÆ, S. SUC'CI P., S. ORY'ZÆ*, L.; ARACK, Fr.; ARAK, Ger. A spirituous liquor imported from the East Indies. The finer qualities are distilled from the fermented juice (*toddy, palm-wine*) of the cocoa-nut tree, palmyra tree, and other palms; and the other kinds, from the infusion of unhusked rice (*rice-beer*), fermented with cocoa-nut or palm-juice, either with or without the addition of coarse sugar or jaggery.

Prop., *&c.* It is colourless or nearly so, but like other spirit, when long kept in wood, gradually acquires a slight tinge, similar to that of old Hollands. The best kinds, when of sufficient age, are pleasant flavoured, and are probably as wholesome as the other spirits of commerce; but common arrack has a strong and somewhat nauseous flavour and odour, depending on the presence of volatile oil derived from the rice, and corresponding to that of corn-spirit. The inferior qualities are hence more heating and apt to disagree with the stomach than the other commercial spirits. In this country it is chiefly used to make punch. When sliced pine-apples are put into good arrack, and the spirit kept for some time, it mellows down and acquires a most delicious flavour, and is thought by many to be then unrivalled for making 'nectarial punch' or 'rack-punch.'

Obs. Batavian arrack is most esteemed; then that of *Madras*; and next that of *China*. Others are regarded as inferior. The common *par'iah-arrack* is generally narcotic, very intoxicating, and unwholesome; being commonly prepared from coarse *jaggery, spoilt toddy, refuse rice*, &c., and rendered more intoxicating by the addition of *hemp-leaves, poppy-heads, juice of stramonium*, and other deleterious substances.

Arrack, Facti''tious. *Syn.* MOCK AR'RACK, BRIT'ISH A.; VAUXHALL' NEC'TAR; &c. *Prep.* Good *old Jamaica rum* (uncoloured), *rectified spirit* (54 to 56 *o. p.*; clean flavoured), and *water*, of each, 1 quart; *flowers of benzoin*, 1 dr.; *sliced pine-apple*, ½ oz. (or *essence of pine-apple*, ½ teaspoonful); digest, with occasional agitation, for a fortnight; then add of *skimmed milk*, 1 wine-glassful; agitate well for 15 minutes, and in a few days decant the clear portion.

AR'ROW-ROOT. The common name of *maran'ta arundina'cea* (Linn.; *m. Indi'ca*—Tuss.); a plant of the *nat. ord.*
(Lindl.; Cannaceæ—Endl.). It w
brought from the island of Dom
badoes, by Col. James Walker.
been extensively cultivated in the

Tubers, yield true ARROW-ROOT
and good they contain about 26%
which 23% may be obtained as ar
the rest by boiling.

Arrow-root. *Syn.* MARAN'TA
MARAN'TÆ, FÆC'ULA M., L.; F
CHIÈRE, PIVOT, Fr.; PFEILWUI
MEHL, Ger. The starch or fec
from the rhizoma or tubers of *ma*
dina'cea (Linn.; see *above*), and
the true 'arrow-root' of commerc

Prep. The fecula is extract
tubers when they are about 10 o
old, by a process similar to that l
farina is obtained from potatoe
muda the tubers, after being wa
prived of their paper-like scale
discoloured and defective part by
are then again washed and drain
subjected to the action of a wh
starch being washed from the
tubers with rain-water; the mi
passed through a hair sieve, or a
and allowed to deposit its fecula.
allowed to drain, after which it i
fully washed with clean water, ag
and, after being thoroughly dried
sun, is at once packed for market.
In St. Vincent (on the Hopew
cylindrical crushing-mill, tinned-
ing machines, and German-silver
shovels, are employed; whilst t
effected in extensive sheds, under
to exclude insects. In Jamaica,
tubes are generally pulped in
mortars; machinery being seldo
in any part of the process.

Prop., *&c.* A light, dull, dead-
less, inodorous powder or small
masses, feeling firm to the finger
ling when pressed or rubbed;
pocket lens it appears to consist
particles, which are shown by a r
be convex, irregular, ovoid or tru
ules, most of them, according to
being ·0010 of an inch in length,
an inch in breadth; mixed with o
from about double to only half t
its action with boiling water, an
properties, it resembles the oth
than which. however, it is fre
peculiar taste and flavour; and
better with the delicate stomach
and infants than the ordinary fari

Comp. Similar to that of the ot

Pur. A large portion of the a
the shops consists either wholly o
the fecula or farina of potatoes,
or less mixed with sago-meal or ric
materials can be readily detected l
scope. Potato starch is known in

pale-blue flame. Its vapour or fumes have a characteristic alliaceous odour; it is slowly oxidised and dissolved by boiling water; but may be preserved unchanged in pure cold water; it rapidly tarnishes in the air, particularly when moist, a black film, consisting of metallic arsenic and arsenious acid forming on its surface; with chlorine, iodine, sulphur, and hydrogen, it unites to form definite compounds. With oxygen it forms acids, but no basic oxide. It combines with the metals in a similar manner to sulphur and phosphorus, the latter of which it resembles in many respects. These compounds are termed AR'SENIDES. Sp. gr. 5·7 to 5·9; sp. gr. of *vapour*, 1·0362.

Uses, &c. With copper it forms a white alloy (PACKFONG); and it is added to some other alloys to increase their whiteness, hardness, and fusibility. In *medicine*, it is only used in combination. In the metallic state it is inert; but, from its great affinity for oxygen, it rapidly becomes oxidised and poisonous; and hence acts as a powerful *poison* when swallowed, or when rubbed on the skin. Its fumes are also highly poisonous. See ARSENIOUS ACID (and *below*).

Arsenic, Tribro'mide of. $AsBr_3$. *Syn.* TERBRO'MIDE OF ARSENIC, SESQUIBRO'MIDE OF A.; ARSEN'ICI BROMI'DUM, L. *Prep.* Add metallic arsenic, in powder, cautiously and in a very small quantity at a time, to pure bromine, contained in a vessel set in ice or a freezing mixture, until light ceases to be emitted; then cautiously distil into a well-cooled receiver.

Prop., &c. Solid below 68° Fahr.; above it, a yellowish fuming liquid, which boils at 428° Fahr.

Arsenic, Trichlo''ride of. $AsCl_3$. *Syn.* CHLO''RIDE OF A., ARSEN'ICI TERCHLORI'DUM, &c., L. *Prep.* 1. From a mixture of arsenic, 1 part; and bichloride of mercury, 6 parts; both in powder, carefully distilled into a well-cooled receiver.

2. Gently boil powdered arsenic for some time in hydrochloric acid to which a little nitric acid has been added; then concentrate cautiously by evaporation, and distil as before. It is also produced, with the disengagement of heat and light, when powdered metallic arsenic is thrown into gaseous chlorine.

Prop., &c. A colourless, volatile, highly poisonous liquid, decomposed by water into arsenious acid and hydrochloric acid. It has been employed as a caustic in cancer and venereal warts; but its use requires the greatest caution.

Arsenic, Flu'oride of. AsF_3. *Syn.* ARSENIC TRIFLUORIDE, TERFLU'ORIDE OF ARSENIC. A fuming volatile liquid, prepared as the bromide.

Arsenic, Trii'odide of. AsI_3. *Syn.* TERIODIDE OF ARSENIC, IODIDE OF ARSENIC; ARSEN'ICII ODI'DUM, A. TERIODI'DUM, L.; ARSENIC IODURE, &c., Fr. *Prep.* 1. From finely-pulverised metallic arsenic, 2 parts; iodine, 11 parts; mixed and gently heated in
glass tube, or a suitable retort, until
tion is complete; the heat being the
and the sublimed iodide collected, and
put into a well-stopped phial.

2. Arsenic, in fine powder, 1 part;
parts; triturate them together, place
ture in a small flask or retort
enough to contain it, and apply a ge
until liquefaction is complete, avoi
formation of iodine vapour; when t
of iodine is no longer perceptible,
mass assumes a reddish-yellow co
crystallises on the sides of the ve
operation is complete, without having
to sublimation. A very easy and
process.

Prop., &c. A deep orange-red, cryst
solid; soluble in water, and highly vol
poisonous. Its aqueous solution y
iodine unchanged by rapid evaporat
when slowly concentrated and set asi
pearly plates are obtained, consisting
nious acid and the teriodide. As a
it combines the properties of both
acid and iodine, but its use requi
caution. It has been successfully
by Dr. A. T. Thomson, Biett, and
obstinate skin diseases (*lepra, impetig*
lupus, psoriasis, &c.), and in real or s
cancer.—*Dose.* $\frac{1}{16}$ to $\frac{1}{12}$ gr. (in pills
tion), gradually increased to $\frac{1}{8}$ or
(A. T. Thomson.) *Externally*, 2½ gr
1 oz.; of which 1 dr. may be used
(Biett.)

Arsenic, Disulphide of. As_2S_2.
SENIC BISULPHIDE, BISUL'PHIDE OF
SUL'PHIDE OF A., &c., REALGAR;
ARSENIC ROUGE SULFURE, ORPIN RO
Fr.; ROTHES SCHWEFELARSENIK,
This substance is found native at S
near Naples, and in several other vol
tricts; but that of commerce is often
by distilling arsenical pyrites, or a m
sulphur and white arsenic, &c., in t
proportions, as noticed under REAL
RED PIGMENTS.

Prop., &c. A fusible, volatile s
scarlet or ruby-red in mass, but oran
powder, by which it is distinguished
nabar; crystals, oblique rhombic pris
gr. 3·3 to 3·6. Its chief use is as a
and in pyrotechny to make white f
factitious sulphide has not the rich
the native mineral, whilst it is mu
poisonous. It is improved by resubli

Arsenic, Trisul'phide of. As_2S
TERSUL'PHIDE OF ARSENIC, YELLOW S
OF A., SESQUISUL'PHIDE OF A., OR'PI
SESQUISULPHURE'TUM, ORPIMEN'T
ORPIMENT, SULFURE JAUNE D'ARSE
Fr.; AURIPIGMENT, OPERMENT, RAU
Ger. This sulphide, like the last,
ready formed in nature; and is prep
ficially, by sublimation, from a mi
arsenious acid and sulphur, as noti

r and Yellow Pigments. It also
precipitate when a stream of sul-
hydrogen gas is passed through an
on of arsenious acid or of an arsenite.
fr. Golden-yellow crystalline lumps,
olden-yellow powder; crystals, right
risms; volatile; fusible; very solu-
re alkalies, by which it is distin-
om sulphide of cadmium; and from
e of antimony by being insoluble in
ric acid. The factitious sulphide
ellow) of the shops often contains
of white arsenic; and is, therefore,
re poisonous than the native trisul-
p. gr. (native) 3·44 to 3·60.

e. As a dye, as a pigment, and as an
t in fireworks, and in some depilato-
k, woollen, or cotton goods soaked in
a of pure orpiment in ammonia, and
ended in a warm apartment or stove-
idly lose their ammonia, and become
tly dyed of a superb yellow colour.
e sulphides (both red and yellow) are
s soluble, and hence, less poisonous,
e prepared artificially. They also
e richest colour; and are, therefore,
by artists and dyers. In former
iment, like realgar, was employed in
See Arsenic.

Pentasul'phide of. As_2S_5. *Syn.*
en'ic acid, &c.; Arsen'ici pentà-
'tum, &c., L. When a stream of
ed hydrogen is transmitted for some
gh a solution of arsenic acid, a pre-
' the pentasulphide is deposited
hours' repose. Its formation is
by boiling the liquid.

e. It greatly resembles the tersul-
s appearance and general proper-

White‡. See Arsenious anhy-

Yell'ow. Trisulphide of arsenic.

IC ACID. H_3AsO_4. *Syn.* Acidum
c, L.; Acide arsénique, Fr.;
ure, Ger.

. Arsenious acid, in fine powder, 2
entrated nitric acid, 6 parts; hydro-
d, 1 part; mix in a flask or tubu-
, and digest, with heat, until solu-
plete; after repose, decant the clear
d evaporate, to the consistence of a
.

ve arsenious acid in bot hydrochloric
hen the solution is cold, add con-
itric acid, in small quantities at a
red vapours cease to be evolved,
ed as before.

ur, thick syrup, occasionally form-
ansparent crystals, very deliquescent,
ted by heat into the anhydrous acid.
poisonous and soluble.

s. *Prep.* Most of the metallic
may be formed by *adding a solution*
salt of the metal to another of an
uniate, as long as a precipitate falls; which must be collected, washed, and dried. The alkaline arseniates may be prepared by adding the base or its carbonate to a solution of the acid, to alkaline reaction, and then evaporating and crystallising the liquid.

Prop., &c. The arseniates of the alkalies are soluble in water; those of the earths and metals insoluble, except in acids. They are isomorphous with the corresponding phosphates.

Tests. Nitrate of silver added to the solution of an arseniate gives a highly characteristic reddish-brown precipitate, which distinguishes it from arsenious acid. Nitrate of lead gives a white precipitate, and the salts of copper greenish-blue ones. Pure lump-sugar dissolved in an aqueous solution of this acid becomes, in a few hours, of a reddish colour, and afterwards of a magnificent purple. Heated with charcoal it evolves a garlic-like odour, and is reduced to the metallic state. The suspected liquid being treated with sulphurous acid and boiled for a short time, the arsenic acid loses oxygen and is converted into arsenious acid, which may be tested for as such. Sulphuretted hydrogen does not precipitate a solution of arsenic acid, or an acidified arseniate, until after the lapse of several hours; and alkaline and neutral solutions, not at all.

ARSENIC ANHYDRIDE. As_2O_5. *Syn.* Anhydrous arsenic acid, Arsenic acid; Acidum arsenicum, L.; Acide arsénique, Fr.; Arseniksäure, Ger. Best prepared by igniting the arsenic acid, in a platinum crucible, at a low red heat, as long as water is given off.

Prop. White deliquescent substance, and violent poison, readily soluble in water to the acid.

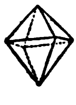
ARSENIOUS ACID. See Arsenious anhydride.

ARSE'NIOUS ANHYDRIDE. As_2O_3. *Syn.* Ar'senious acid, Ar'senic, White a.; Acide arsénieux, Arsenic blanc, Oxyde, Fr.; Arsenigsäure, Arsenichste s., Ger.; Arsenico bianco, It.; A. blanco, Sp. The arsenic, or white arsenic, of the shops.

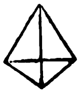
Sources. The white arsenic of commerce is principally imported from Germany, where it is obtained in the process of roasting arseniuretted cobalt ores, in making zaffre. At Altenburgh it is procured from arsenical iron pyrites (mispickel); and at Reichenstein from native arsenide of iron. About 900 to 1000 tons are also annually collected at Cornwall, being principally a secondary product of the process of roasting grey copper ore and white mundic. The British arsenic works in that county, are perhaps the finest in the world. The usual plan is to roast the powdered ore in muffle-furnaces; by which its arsenic is converted into arsenious anhydrid, which escapes as vapour (*smelting-house smoke*), and passing *into the condensing-chambers*, is deposited *in a pulverulent state*, forming the flowers of *arsenic, or rough white* arsenic, of the smelters, (the giftmehl or poison-flour of the Germans). The crude article obtained in this way is purified by re-sublimation in suitable iron pots or other iron vessels, before it is fit for sale. It then forms a semi-transparent vitreous cake, which gradually becomes opaque, and of snowy whiteness, by exposure to the air, and at length acquires a more or less pulverulent state on the surface.

Prop. Crystals (obtained by careful sublimation, or by cooling a boiling aqueous solution), usually transparent, regular octahedrons (see *fig.* 1), but sometimes, though rarely, assume the form of tetrahedrons (see *fig.* 2). When prepared on the large scale, it forms large, glassy, colourless or yellowish-white, transparent or semi-transparent cakes or porcelain-like masses (vit'reous arsenious acid, gla'cial a. a.), which soon become opaque on their exterior, and often friable and pulverulent; odourless; volatilises at 380° Fahr.; fumes, odourless, unless carbonaceous organic matter be present, when they smell strongly of garlic; heated under pressure it liquefies and forms a transparent glass; taste, faintly sweetish, with a slight acidity and astringency, not perceived until some minutes after being swallowed. The opaque variety is soluble in 80 parts of water at 59° Fahr., and 7·72 parts of boiling water; but on cooling to 60°, only about ⅓rd of this quantity continues in solution. The transparent variety is soluble in 103 parts of water at 59°, and 9·3 parts of boiling water. Both soluble in alcohol, syrups, oils, and spirits, and freely so in alkaline lyes and hydrochloric acid; organic matter generally impedes its solution; solutions redden litmus; heated with organic matter it is reduced to the metallic state. Sp. gr. 3·5 (lowest opaque var.) to 3·8 (highest transp. var.).

1.



2.



Arsenites. True arsenious acid ($HAsO_2$) has never been obtained in a satisfactory condition, but its salts are readily obtained by dissolving arsenious anhydride in a solution of the base, or by double decomposition. They are generally white, nearly all insoluble, except those of the alkalies, and all soluble in acids.

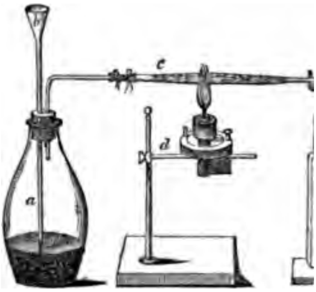
Tests, Detec., &c. Owing to the importance of the subject, and for convenience and facility of reference, the leading tests for the arsenites and arsenious anhydride are noticed alphabetically below; to which a few general remarks on their application, under the various circumstances that occur to the chemist and toxicologist, are appended. When not otherwise stated, it is to be understood that they are to *be applied to pure, or nearly pure and colourless solutions of arsenious acid* or the arsenites.

Ammonio-nitrate of silver give marked yellow precipitate of arsenit in an agneous of arsenious anhydri which is soluble in ammonia and nitric acid.

Crystallisation Test.—A very mi tity of arsenious acid placed in a (arsenic-t heated in of a sp gives a sublimate lects on portion o and whicl amined b lens, is fo sist of sp tahedral *engr.*).

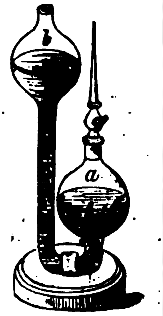
(Magnified.)

Ellis's is a mod the 'nascent hydrogen test,' in suspected gas is passed through a taining slips of copper leaf or rib better pure oxide of copper, gent the end of the tube communicatin atmosphere being drawn to a capill which the gas may be enflamed an in 'Marsh's Apparatus.' (See *engr.*) be abundant in the gas, the copper most instantly frosted over with a metallic arsenic; and after continuir for a few minutes it will present silvery surface, and may then be su further examination.

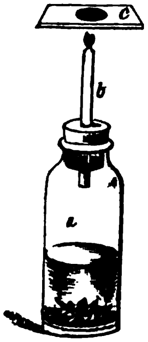


(*a*.) Flask containing the suspected fluid phuric acid, and zinc.
(*b*.) Funnel.
(*c*.) Tube containing the copper-leaf or c. heated by the lamp (*d*).
(*e*.) Support.
(*f*.) Capillary end of tube (*c*), with the gas

Lassaigne's Test. (Adopted by t Academy.) This consists in passin generated in the suspected liquid, a solution of nitrate of silver. (When arsenic is present black f metallic silver are deposited, and acid remains in solution mixed with and some arsenide of silver. Th liquor, treated with ammonia, will semble those from arsenic. The flame which produces it is very pale blue or bluish-white; whereas antimoniuretted hydrogen burns with a pale green or greenish-yellow flame, and a white smoke, both of which are characteristic.



Obs. Marsh's test is admirable for its simplicity, delicacy, and trustworthiness, as well as for the ease of its application. It is adapted to all liquids, whether colourless or coloured, which are not so glutinous as to inconveniently froth during the extrication of the hydrogen.[1] Various modifications of the original apparatus have been proposed to obviate this difficulty; among which the one chiefly deserving notice is figured in the margin. It consists of a bent tube having two large bulbs blown in it, and fitted with a stop-cock and jet in the usual manner. In this case the grains or fragments of zinc are put into the lower bulb (*a*). It is, however, worthy of remark, that, with ordinary care and skill, a simple wide-mouthed bottle, furnished with a tube and cock, will often be found to answer quite as well as more costly apparatus; as the fluid is less liable to froth than in a narrow tube. Even a common quinine-phial, or a 4-*oz.* or 6-*oz.* medicine phial, fitted with a piece of glass tube of very small bore, or even with a piece of a common tobacco-pipe, for a burner (see *engr.*), may be used when no more convenient instrument is at hand.

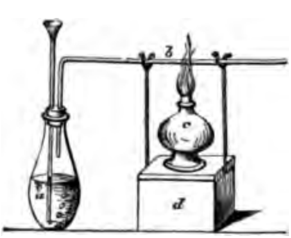


A film of oil placed on the surface of the liquid tends considerably to lessen the frothing.

Objec., precau., &c. Objections have been raised to this mode of testing, from the great frothing which often occurs with organic mixtures, and from antimony and imperfectly charred organic

matter also forming crusts somewhat r
to the inexperienced eye, those produc
nic. But these objections are invali
there are easy means of purifying
before testing it, and of discriminatin
true arsenical spots or deposits, and
Another objection is, that both zin
phuric acid sometimes contain arsen
obviate this difficulty, we have or
them when perfectly pure; and to
by means of the apparatus before p
suspected liquid into it. Indeed, th
tions apply with equal force to all
which depend on the production o
hydrogen. The precaution necessary
and to reliable results, is to set the
with simple zinc, acid, and water, an
has worked a short time to test th
gas for arsenic (as above); when, i
of that substance is detected, the
fluid, in which the organic matter (if
has been destroyed by any one of th
hereinafter pointed out, may be a
the operation continued. Care shou
taken not to light the jet of gas bef
atmospheric air is expelled from the
as without this precaution an expl
take place.

Nascent Hydrogen Test. The
used may be similar to that figur
engr. The plan followed in the lab
Giessen, is to heat the long tube
which the gas passes to redness
parts, to produce distinct metallic mi
then to remove the tube from the
apparatus and transmit a very feeb
of dry sulphuretted hydrogen throu
metallic mirrors being at the same ti
by means of a common spirit lamp
outer towards the inner border or
If arsenic alone is present, yellow t
of arsenic is formed within the tube
mony alone is present, an orange-red
trisulphide of antimony is produce



(*a*). Flask containing the suspected fluid,
phuric acid, and zinc.
(*b*.) Small tube, at the one end having an
lary orifice, where the gas is inflamed.
(*c*.) Spirit-lamp.
(*d*.) Support.

the mirror consists of both metals,
sulphides appear side by side, the
of arsenic, as the more volatile, lyir
ably before the sulphide of antimon

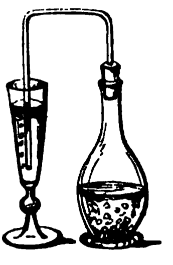
---

[1] Animal tissues and liquids containing organic matter are best prepared for testing for arsenic by Marsh's test, in the following manner proposed by Odling:—The tissue, or the residue obtained by the evaporation of a liquid over a water-bath, is to be *thoroughly* dried at a temperature of about 212° F., then ground to powder or cut up into small pieces, next drenched with the strongest hydrochloric acid and allowed to stand twenty-four hours in a warm place, and finally distilled. The distillate will contain arsenic (if it existed in the material under examination) comparatively free from organic matter, and is, therefore, in a fit state to be introduced into Marsh's apparatus, as *the organic matter, which is the cause of frothing, has been removed.*

seconds is often sufficient to obtain a coating; but which, for safety sake, may be extended to 2 or 3 minutes, or even longer. Liquids rich in organic matter also require longer boiling than those nearly free from it. The coated copper, which has now acquired a characteristic iron-grey colour, is then taken from the liquid, carefully washed in distilled water, in alcohol, and (if greasy) in ether, next dried on blotting paper, and then either cut into small pieces or rolled into a small coil or cylinder. It is then heated in a reduction-tube over a spirit lamp, when the metallic arsenic forming the coating is volatilised, and yields a sublimate of minute octahedral crystals of arsenious anhydride; or, if the tube be very small, or any reducing agent be added, a bright metallic ring. When the coating on the copper is sufficiently thick, it may be scraped off with a knife, and heated separately in an arsenic-tube.

This test is invaluable as affording a certain and ready means of abstracting arsenic from its solution, whether pure or mixed with organic matter. The contents of the stomach or other viscera may thus be at once examined, without any tedious preliminary operations. In this way Dr. Christison discovered the presence of arsenic upwards of 4 months after interment; and we have ourselves found it 2 years and 8 months after interment. The coated copper may be preserved unharmed for years. Dr. Taylor found that the 1-8th of an inch of one of these deposits that had been kept in paper nearly fourteen years, gave a well-marked ring of octahedral crystals, when heated.

Sulphuretted Hydrogen Test; Sulphur Test. This produces a bright yellow precipitate of trisulphide of arsenic (orpiment) in solutions containing a free acid; but acts slowly and imperfectly on pure and neutral solutions, and does not disturb those that possess an alkaline reaction. The suspected liquid should therefore be slightly acidulated with hydrochloric or acetic acid before applying this test, unless it be already acid, when it is better first to neutralise it with an alkali, and then to add the acid. The transmission of the gas through the liquid (see *engr.*) should be continued for at least half an hour; when the end of the conducting tube, after being well rinsed in the liquid, is removed, and the glass, lightly covered with a piece of porous paper, set aside in a temperature of about 100° Fahr., until the odour of sulphuretted hydrogen is completely lost. The precipitate is now collected on a small filter, washed with pure water, and dried by a gentle heat. It is then placed in a watch-glass or



small capsule, and redissolved in a
of ammonia, which is then again
heat; or it may be at once submit
firmatory tests. It is shown to cont
by its ready and perfect solubili
monia, and in solutions of the fix
their carbonates and bicarbonates,
line sulphides; by being nearly
hydrochloric acid, even when conce
boiling; and by yielding a meta
when mixed with a flux and submi
reduction-test (which *see*).

Sulphuretted-hydrogen water a
drate of ammonium act in a sim
gaseous sulphuretted hydrogen; bu
effectively.

For accuracy, the sulphuretted
should be washed by passing it thro
bottle containing a little pure wa
phuric acid, before allowing it to
arsenical liquor. The reduction of
precipitated sulphide is generally
the most important part of the in
and requires great care and att
extremely elegant and sensitive
effecting this, is by heating the m
stream of dry carbonic acid gas. T
has been followed by Drs. Babo an
with the most satisfactory results,
performed:—(*A*) is a capacious f
evolution of carbonic acid, half
rather large pieces of solid limest
ble (not chalk). To one aperture
bly perforated cork, a funnel-t
adapted, which nearly reaches to
of the vessel; to the other apertur
by means of which the gas evol
ducted into a flask of smaller s
which it is washed and dried by c
sulphuric acid. The tube (*c*) c
carbonic acid into the reduction
which is shortened in the *engr.*, a
made of difficultly fusible glass.
apparatus is prepared, the sulphid
intended for reduction is rubbed
basin, previously heated in a wate
about twelve parts of a well-dri
consisting of 3 parts of dry carbonat
and 1 part of cyanide of potassiu
by Liebig's method). The mixed
then placed on a small strip of card
into the shape of a gutter, which is
into the reduction-tube up to the
and the tube is turned half roun
manner the mixture is deposited w
ing any other part of the tube;
the strip of card-paper is cautiously
The reduction-tube is then, by m
cork (*e*), fixed in its place; a mode
of carbonic acid gas is evolved
hydrochloric acid into the funnel-t
the 'mixture' carefully dried, by
rately heating the tube along its w
by means of a small spirit lamp.
gas-stream has become so slow th
bles pass through the sulphuric a

stomach (cut into small pieces), together with its contents, is submitted to some further process, to obtain a solution suitable for the application of the usual tests. The liver, also some muscle, and any other portion of the body that may be selected, are likewise separately treated in the same manner. We have here, both solid and liquid organic matter to operate on, and the problem for solution is, the abstraction of their arsenic in the simplest and most certain manner, and in a form in which its presence may be demonstrated by tests. This subject has long engaged the attention of the most eminent chemists and toxicologists, and various plans have been proposed for the purpose; among which the following appear to be the most valuable, and that usually adopted:—

(Reinsch.) Solids (as the stomach, liver, &c.) are cut into small fragments, and boiled in a glass vessel with water acidulated with about 1-4th of its volume of hydrochloric acid, until the tissues or fragments are entirely broken down into flakes or grains, when the whole, after filtration, is again heated to the boiling-point, and tested as described under Reinsch's test (see ANTIMONY). Liquids do not require this preparation.

Estim. This may be effected in various ways:—

1. GRAVIMETRICALLY:—Arsenic is usually WEIGHED under the form of arsenate of lead, arsenate of sesquioxide of iron, tersulphuret of arsenic, (metallic) arsenic, or (directly) as arsenious anhydride. The last three only, as the more simple and convenient, will be noticed here:—

As Trisulphide:—The whole of the arsenic being precipitated by a stream of sulphuretted hydrogen, with the necessary precautions, in the manner already noticed, the precipitate, after being carefully collected, washed, and dried, is purified by redissolving it in pure ammonia water, and evaporating the resulting solution in a weighed watch-glass or capsule, by the heat of a water bath. It is then dried at a temperature not above 212° Fahr., and finally weighed. Each grain of the tersulphide so found corresponds to ·80487 gr. of arsenious acid, or ·61 gr. of metallic arsenic.

As (metallic) Arsenic:—Obtained by one of the processes already given. Each gr. represents 1·32 gr. of arsenious acid.

As Arsenious anhydride:—Obtained in a weighed capsule or tube, either by the crystallisation or sublimation test. The weight is the answer sought for arsenious anhydride. Each gr. of this is equiv. to ·75758 gr. of metallic arsenic.

VOLUMETRICALLY. (Method of F. Mohr.) This depends on the fact, that an aqueous solution of arsenious acid, or of an alkaline arsenite, when mixed with an excess of saturated solution of pure bicarbonate of soda, and a little starch-paste, has its arsenious acid converted into arsenic acid, by a solution of iodine. *A standard solution of iodine* is, therefore, an
appropriate arsenim'eter for the
ture. The solution of iodine is
the blue starch-reaction just begin
the arsenious solution having bee
exactly neutralised with pure c
soda, if acid; or with pure hydro
if alkaline. The results are accur
substance capable of oxidising or
iodine is present in the liquid teste

Phys. eff., &c. Arsenious anhyd
arsenic is alike destructive to ve
animal life. Seeds soaked in an
weak solution of it, lose their po
mination; and buds plunged in it
capable of expanding into flow
applied to the leaves, roots, or st
tion takes place, and the plant s
On combustion it evolves the c
garlic-like odour of arsenic, and
be discovered in its substance
tests. According to Jäger, Gilge
Pereira, a few of the lower order
are occasionally developed in
arsenious acid. To all animals, f
fusoria up to man, arsenic proves
although in different degrees;
susceptibility of its effects existin
account of the superiority of his d
In all of them death is preceded b
actions and increased evacuation
from the mucous surfaces. Diffi
tion, thirst, vomiting, and convuls
leading symptoms which gradual
themselves as we approach the hi
of the system. (Jäger.) In ve
therapeutical doses, properly adm
is a valuable medicine, and acts
alterative, and antispasmodic att
externally, as an escharotic. In
creased medicinal doses, or long-con
doses, nausea, vomiting, purging,
bility, emaciation, and all the eff
poisoning, occur in succession –
sinking of the powers of life, v
violent symptom; a nameless fe
ness, failure of the strength, an
food and drink, and to all the en
life. Redness of the conjunctiva
headache and giddiness, spasms,
eruptions, numbness and paraly
limbs, and pytalism, are also fr
well-marked symptoms of slow p
arsenic. In an excessive or pois
the symptoms are rapid and viol
indicating extreme gastro-intestina
tion and disorder of the cerebro-
tem, and often occasioning death i
3 days. The smallest fatal dose
corded by Christison is 4½ grs., ta
tion. The subject was a child 4
and death occurred in six hours.
stroyed a robust girl in 36 hours.
2 grs., in solution, are suspected to
the death of a full-grown woman.
may be a fatal dose. (Dr. A. Tay
withstanding these facts much la

or liquids containing it (in cold water, ad libitum). Milk, wheat-flour, oatmeal gruel, (with water, ad libitum). Lime water, with milk (as the last). Chalk, with milk and water (as the last). Infusion or decoction of bark, or better, of nut-galls (as the last). Sugar or syrup (ad libitum). See *Treatm.* (above); also the above substances under their respective heads.

Uses, &c. Arsenious anhydride and its compounds are extensively employed in the arts and medicine. It is used by the dyer, it furnishes the artist with several of his most beautiful pigments, and the glass-maker and enameller with a flux or material to whiten and decolour their wares. In *agriculture*, it is used (in solution) as an anti-smut for seed-wheat; and as an anti-vermin lotion or dipping for sheep and cattle. In small (therapeutical) *doses* it is a valuable remedy in intermittent fevers, chronic skin diseases (especially lepra and psoriasis), and in several nervous affections (as neuralgia, epilepsy, chorea, tetanus, &c.). It is the active ingredient of the tasteless ague-drop; and in the Tanjore pills, long celebrated in India for the cure of the bite of the cobra di capello and other venomous serpents, as well as of hydrophobia. It has been given in syphilis, chronic rheumatism, typhus, and several other diseases, with more or less advantage. Cautiously administered in phthisis, it frequently restores the appetite and strength, and greatly retards, and in some cases, arrests the progress of the disease. It has been recently used to relieve toothache arising from caries. *Externally*, it is employed in the form of powder, lotion, and ointment, for the cure of cancer. Plunkett's Ointment, Pâte arsénicale, Davidson's Remedy for Cancer, and several other like preparations, owe their activity to arsenious anhydride. Water in which white arsenic has been steeped has become a favorite cosmetic wash with many ladies, since its assumed property of softening the skin was announced in a certain popular periodical. Its use, whether internal or external, is, however, attended with considerable danger in unskilful hands, and should, therefore, never be adopted but under proper advice.—*Dose.* $\frac{1}{30}$ to $\frac{1}{8}$ gr., made into pills with crumb of bread and lump sugar; or in solution, 3 to 5 *or* 6 drops, twice or thrice daily, gradually and cautiously increased to 12, or even 15 drops. As a *rule*, arsenical preparations should be taken soon after a meal, and by no means on an empty stomach. (Dr. A.
The dose should be suspended,
duced, as soon as the conjuncti
(Hunt); or if dryness of the mo
or irritation of the stomach or b
Mr. Macculloch found the pills m
than the solution; they act di
cannot be substituted for one an

Arsenic is a favorite tonic
with farriers; who often admi
carelessly to horses, to the ser
these animals. It is also a
grooms, who have imbibed th
small doses of it contribute t
condition of the skin. The
veterinarians, however, either w
or use it with very great cautio
a HORSE), 2 to 5 *or* 6 grs., t
daily; in farcy or glanders, 10
solution it is often employed as
ping to destroy vermin in catt
but its use is not free from dang
to the shepherds or dippers.

Gen. commentary. The neces
the preceding article, owing to
portance of the subject in it
toxicology and medical jurispru
us little space for further rem
addition to what has been sai
testing, it may be useful to cauti
of the absolute necessity of o
tests and reagents which are th
lutely pure; and in which the
by personal examination, failed
slightest trace of arsenic. Co
phuric, nitric, and hydrochloric
soda, nitre, iron, and zinc, freq
arsenic; from which, however,
freed by chemical processes; o
purchased in the pure state fr
dealers in chemicals. But no as
vendor should be regarded as a
purity. In all judicial inve
absence of arsenic in the severa
agents, and the apparatus empl
demonstrated and sworn to. W
add, that the results afforded by
can be depended on. In matte
importance, the most ample co
dence must be sought.

Marsh's, Reinsch's, Lassaigne'
and the *Reduction Tests*, and t

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partly of fatty substances, such as broth, milk, &c. It likewise explains how arsenious anhydride, taken in powder, may sometimes remain a long time in the stomach before it produces any deleterious effect; since, in such cases, its action is hindered by the presence of fatty matter. Jugglers often swallow arsenic with impunity, because, according to Dr. Blondlot, they previously take the precaution to drink milk and eat fat bacon. Hence, in cases of poisoning by arsenic, oils and fatty substances may be administered as real antidotes, capable of suspending the action of the poison for a considerable time, until more radical means of effecting a cure can be applied. The *people engaged in some of the arsenic-works regard salad oil as almost a certain antidote* to this poison.

[1] "As a therapeutic agent for hors
can be well dispensed with. It is, howe
some as a tonic, in doses of from 10 to
by others as a vermifuge. When inju
tered death has been the result. By
school it is extolled as a caustic, and a
doubtlessly it is; but there is this disad
its use—we cannot control its action, a
most extensive and painful wound is ca
sionally it is resorted to for the erad
although a better plan is to extirpate t
the knife. When, however, this is inad
arsenious acid, in very fine powder, ma
parts of lard, and a (small) portion o
applied, with friction, over and around
every other day, for three or four times.
such a powerful sloughing action, that
the warts will be thrown off." (Prof. M

senic, as has been done during the last 3 or 4 years, is another matter deserving consideration, and one which has been ably pointed out by Dr. Letheby, in his reports, as Officer of Health to the City of London,

Dr. Lois has found arsenic, often in large quantities, in ordinary brass, and brass utensils; and we have ourselves repeatedly found arsenic in the Britannia-metal, German-silver, and other cheap white alloys at present in such general use.

The preceding facts are recommended to the careful attention of medical jurists.

By Act of Parliament[1] it is provided—1. That every vender of arsenic shall, before the delivery of the same to the customer, enter in a book or books kept for the purpose, the date of sale, name, and residence of the purchaser, in full, his or her condition or occupation, the quantity so sold, and the purpose or purposes for which it is required, in a form set forth in the schedule to the Act; which form or schedule shall be signed by the vender, and by the said purchaser, unless he be unable to write, when such fact shall be recorded in the said schedule by the vender; and this schedule, when a witness is required to the sale, shall also bear his signature, together with his place of abode:—2. *Arsenic* is *not* to be *sold* to a *stranger*, unless in the presence of a witness acquainted with both vender and purchaser:—3. *No person* to *sell arsenic* unless it be previously mixed with *at least* 1 *oz.* of *soot* or ¼ *oz.* of *indigo* to the pound; unless such admixture would be injurious to the object for which it is intended, when not less than 10 *lbs.* is to be sold at any one time:—4. *Penalty* for *evading* the *Act*, either as vender, purchaser, or witness, £20:—5. Act *not* to *extend* to *arsenic* used in compounding *prescriptions*, nor to the *wholesale trade*:—6. The word '*arsenic*' to include 'arsenious anhydride, and the arsenites, arsenic acid, and the arseniates, and *all* other colourless poisonous preparations of arsenic.' See ARSENIC, ARSENIC ACID, LOTIONS, PILLS, SHEEP-DIPPING, SOAPS, SOLUTIONS, TOOTH-CEMENTS, WHEAT-STEEPS, IRON, POTASSA, SODA, and other *Bases*, &c. &c. (also *below*).

Self-detect'ing Arsenious Anhydride. *Prep.* (Dr. Cattell.)—1. Ordinary *white arsenic* to which is added a small quantity of a mixture of *dry calomel* and *quick-lime*; or of *dried sulphate of iron* and powdered *gall-nuts*. The *product* is *white*, but immediately turns BLACK when mixed with liquids:—2. As the last, but adding a mixture of *thoroughly dried sulphate of iron* and *ferrocyanide of potassium*. Strikes a BLUE:—3. As last, but using *dried phosphate of sodium* and *dried sulphate of iron*. Strikes a GREEN. Proposed as a method of preventing arsenic being used as a poison.

ARSENIDE. *Syn.* ARSEN'IURET; ARSENIURE'TUM (-i-ū-), L.; ARSÉNIURE, Fr. A combination of arsenium with a metal (including *hydrogen*), in definite proportion.

AR'SENITE (-nīte). *Syn.* AR'SEN ARSÉNITE, Fr.; ARSENIGSÄURE SAL A salt of arsenious acid.

ART. [Eng., Fr.] *Syn.* ARS (*gen.*, *pl.*, ar'tes), L.; τέχνη (*teck'ne*), Gr.; Ger. *Primarily*, strength, power, an also mental strength, skill; the applic knowledge or power to effect a desi pose; the power or ability of doing so not taught by nature or instinct; practi guided by rules. SCIENCE is *knowledg* *practical skill* in applying this kno ART is *applied science;* whilst SCIE *knowledge* obtained by *observation*, exp and *ratiocination*. This distinction is more fully seen than within the do *chemistry*, where knowledge, deduction power of generalisation, and great exp are necessary elements of success. A filled the world with luxuries, conve and comforts; and *art*—the ARTS— *fine*—are the safest and surest civilise race. See SCIENCE.

ARTE'SIAN (-tē'-zhăn; *or* -ti [From *Artois*, a province of France, in such wells were first formed.] *Syn.* SIEN, Fr. In *physics* and *civil engin* applied to very deep borings into the from which water flows. See FOUN WATER, WELLS, &c.

ARTHANI'TINE (-tĭn). [Eng., Fr.] ARTANI'TINE; ARTHANITI'NA, L. A substance first obtained by M. Sal the action of *alcohol* on the tuberous the herb *arthrani'ta* or *sow-bread*. It is colourless, and crystalline, and impar acridity to the plant.

AR'TICHOKE. *Syn.* CIN'ARA, C SCOL'YMUS, L.; ARTICHAUT, Fr.; SCHOCKE, Ger. The *cyn'ara scol'ym* (a thistle-like perennial plant of the Compositæ (DC.). *Hab.* Southern Europ now extensively cultivated in our gard its 'bottom,' or the sweet fleshy recept its flowers, which is eaten as a potherb. are cooked by brisk boiling in water, ends uppermost, until tender; and tak hour, according to their age. Sometim are *preserved* in brine (PICKLED ARTICH and also after depriving them of the ' and spiny hairs and blanching them by sion in boiling water, by drying in th (DRIED ARTICHOKES; CULS D'ARTIC Fr.), by which they retain their flavo some time. *Infusion of the flowers*, use rennet.

As an esculent the artichoke resembles ragus in its general properties; but it i to be more nutritious, and even more dis

Jeru'salem Artichoke. The *helian'th bero'sus* (Linn.), a perennial plant of th flower family, and quite distinct from th ceding. *Hab.* The Brazils. It is cult in England for culinary purposes. *Roo* bers), resemble the artichoke in flavou are considered far from wholesome, bei

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[1] 14 Vict., c. xiii, 1851.

AUVAGE, OREILLE D'HOMME, &c.,
ELWURTZEL, Ger. The ἄσαρον of
, a small, round, hard, stemless,
baceous plant, bearing chocolate-
owers; and of the *nat. ord.* Aristo-
C.). It grows freely in central
d is found in woods and shady places
hire, Westmoreland, and other parts
d. *Hab.* Europe, between 37° and
a.—*Root & rhizome* (AS'ARI RA'DIX),
er-like odour and an acrid taste:—
FO'LIA), less odorous, though bitter-
id, and aromatic; formerly officinal
rmacopœias:—*Whole plant* (ASARA-
the shops), nauseant, emetic, and
. Before the introduction of ipecac-
was the common emetic (6 to 9 of the
ves in whey); but, owing to the
f its action, it has long fallen into
Its common name in France (CABA-
ublic-house plant), is said to have
m its frequent employment to relieve
ach of those who had drunk too hard.
almost solely used as a sternutatory
, and is probably one of the best.
ing to Gräger,[1] asarabacca contains
latile, oily principles, which may be
by distillation with water:—VOLA-
(*o'leum as'ari*):—AS'ARITE, an odour-
teless, and crystalline solid; fusible
tillable, yielding white and very irri-
mes:—AS'ARUM-CAM'PHOR, differing
rom the last in being precipitated, by
rom its alcoholic solution in cubes or
l prisms, instead of delicate flexible
Also a brownish, bitter, crystallisable
e (AS'ARINE, AS'ARUM-BIT'TER), which
e in alcohol.

See PATENT MEDICINES, POWDERS, SNUFFS, &c. (also *below*).

AS'ARIN (-rĭn). $C_{20}H_{26}O_5$. *Syn.* ASARONE. A species of stearopton, discovered by Görtz, in asarabacca. It has an aromatic taste and an odour resembling camphor, and is said to be emetic. It is probably a mixture of asarum-camphor and some partially oxidised volatile oil. (See *above*.)

As'arine (of Gräger). *Syn.* ASARI'NA, L. The crystallisable bitter principle of asarabacca, noticed above. It is said to greatly resemble *cytisine*.

AS'ARITE (-rīte). See ASARABACCA.

ASBES'TOS. *Syn.* ASBES'TUS (ασβεστος, *incombustible, unconsumable.* Gr.), AMIANTH'-US, LA'PIS A., &c., L.; ASBESTE, AMIANTE, Fr.; ASBEST, STEINFLACHS, Ger. In *mineralogy*, a soft, fibrous substance, composed of flexible or elastic filaments which, in their most highly developed form, greatly resemble those of flax or silk, and which bear exposure to a very considerable degree of heat without suffering decomposition. It has been proposed to clothe our firemen in dresses of asbestos; but without freedom of respiration could be insured in a heated and poisonous atmosphere, this envelope would be of little service. Gloves are sometimes made of it, for holding red-hot crucibles. It is also used as a filtering medium for corrosive liquids.

Var. Of these there are several; as AM'I-ANTH OR ELAS'TIC ASBESTOS, LIG'NIFORM A., MOUNTAIN-CORK, M.-LEATHER, M.-WOOD, &c.; varying from a grey, brown, or green colour, to pure white, and from extreme flexibility and softness, to rigidity and hardness, as indicated by the respective names. In common language, fully exhibited in agues; *seeds*, acrid, bitter, and diuretic; *leaves*, purgative, diuretic, and febrifuge; sometimes used instead of senna. In southern Europe it exudes an inferior kind of MANNA, and its medicinal properties are much greater than in our climate.—*Dose.* (Leaves) ½ *oz.* to 1½ *oz.* (made into an infusion), as a purge; *seeds*, 1 dr., as a diuretic, &c.

Flow'ering Ash. *Syn.* MAN'NA-ASH; FRAX'INUS OR'NUS (Linn.), L. A small tree of southern Europe. Yields MANNA. The '*round'-leaved flowering-ash*' (CALA'BRIAN-ASH; FRAX'INUS ROTUNDIFO''LIA, Lamarck) is a smaller variety of the preceding, and a native of Calabria and the Levant. Said to yield the best MANNA. The '*small'-leaved flowering-ash*' (FRAX'INUS PARVIFO''LIA, Lam.), is another manna-yielding species, indigenous to Asia Minor.

ASH. Ashes (which *see*).

ASH-BALLS. The ashes of land-plants, especially ferns, damped and made into balls. *Used* as a substitute for soap in washing, and in cleaning paint.

ASH'ERY. [Amer.] A place where potash or pearlash is made or kept.

ASH'ES. (-iz). [Eng. pl.] *Syn.* ASH; CI'NIS, L.; CENDRES (*pl.*), Fr.; ASCHE, Ger. The remains of anything burned. In *antiquity*, the remains of a body consumed on the funeral pyre; and hence, figuratively, the remains of the dead. The word, in English, has properly no singular; although '*ash*' is very commonly heard; and is now almost exclusively used in composition, as in *pearlash*, *potash*, *soda-ash*, &c.

Ashes. In *commerce*, the residuum of the combustion of vegetable substances containing either *carbonate of potassium* ('land-plants'), or *carbonate of sodium* ('marine plants'), and from which the commercial alkalies are obtained. Their *value* depends upon their richness in 'alkali,' which is determined in the manner explained under ALKALIMETRY. The word is also commonly employed as a general term for the crude carbonates of potash of commerce (which *see*).

Ashes of Plants. See MANURES, PLANTS, VEGETATION, &c.

ASPAR'AGIN (-ă-jĭn). $C_4H_8N_2O_3$. [Eng., Fr.] *Syn.* ALTHE'INE, ASPAR'AMIDE, MAL'AMIDE*; ASPARAGI'NA, ASPARAGI'NUM, L.; AGÉDOÏLE, Fr.; SPARGELSTOFF, Ger. A peculiar azotised principle discovered by Vauquelin and Robiquet in asparagus, and since found in the potato, marsh-mallow, liquorice, climbing vetch, and several other plants. Many plants which do not naturally contain it may be made to yield it by growing them in dark damp cellars; whilst many which only normally contain it in very small quantities, are found to yield much more when allowed to vegetate in the same manner.

Prep. 1. From ASPARAGUS-SPROUTS:—The *expressed juice*, *after being* heated to the
boiling-point (to coagulate album
fully skimmed and filtered, is eva
gentle heat, to a syrupy consisten
abandoned to spontaneous evapo
warm dry atmosphere for seven
resulting crystals being purified
washing with very cold water or
alcohol, re-solution, and re-crystal

The following are cheaper and
venient processes:—

2. From MARSHMALLOW-ROO
root (chopped small, or grated)
for several days in milk of lime,
the filtered liquid precipitated wi
of ammonium, and the clear sol
rated in a water bath, and other
as before.

b. From the expressed juice, 2
of lime, 1 part; agitated well t
liquid portion, after some hours, be
filtered, and evaporated, &c., as b

3. From the ETIOLATED SHOOTS
—The expressed juice of the
when from 2 or 3 to even 12
long, is gently simmered for 8 o
to coagulate the albumen, and, a
or clarification, the clear liquid i
porated to the consistence of a th
set aside to crystallise, as before.
ing brown crystals are purified
with very cold water, re-solutio
water, and re-crystallisation, as i
and what is better, the hot liquid
poration to a syrup, is digested
time with a little pure animal
coarse powder, and then filtered,
and beautifully white crystals ar
the first operation.[1] An excell
economical process.

Prop., *&c.* Crystals brilliant,
colourless, right rhombic prism
test-paper; non-basic; having a
and scarcely nauseous taste; sc
in cold water; freely soluble in
insoluble in strong alcohol and et
unaffected by alkaline sulphuret
ammonia, acetate of lead, or infu
triturated with quick-lime, ammo
heated to 212° Fahr. the crystals
or 12⅝ of water; heated with
pressure in a closed vessel, or
with an acid or an alkali, or disso
charine liquid and then submitt
tation, it is converted into am
ASPAR'TIC ACID; aqueous solutio
gin and aspartic acid treated wit
nitrous acid evolve pure NITRO
formation of MALIC ACID whic
solution. It was called *asparam*
impression that it is *aspartite*

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[1] This use of *animal charcoal* may also be
extended to the other Formulæ. Mr. C.
Ure's "*Dict. of Arts, M., & M.*," 4th ed., d
to be used when of "a length of 2 inc
authorities recommend them to be of 9,
inches. The selection must, however,
depend upon circumstances and conveni

since some specimens of the purest and most beautiful description, from the great Bitumen Lake of Trinidad, were given us by our respected and venerable friend, the late Earl of Dundonald, who stated, that the supply of both liquid and indurated bitumens, of every grade of quality, was unlimited from that source; but that owing to injudicious importations of inferior kinds, (those most easily shipped,) a prejudice had been created against them in the London market. Our personal investigations have since confirmed the accuracy of these statements.

Uses. The finer varieties are chiefly used as a 'glazing colour' by artists, and in the manufacture of black varnishes and japans. The inferior kinds are applied to the same purposes as ordinary solid bitumen. The Egyptians used it in embalming under the name of MU'MIA; and the Babylonian builders are said to have employed it, as a cement, in lieu of mortar. It is, however, doubtful whether the hard semi-vitreous variety of bitumen, properly termed 'asphaltum,' was that which was thus employed; its present hardness being probably due to time. As a *medicine*, it is stimulant; and it was formerly used as an ingredient in certain plasters and ointments. See BITUMEN, PITCH, &c. A mixture of asphalt, chalk, sand, ground sandstone, &c., is used as a pavement for making water-tight tanks and covers, as a coating for gas and water pipes, and for various other similar purposes. Sometimes the pitchy residue obtained by distilling off the more volatile portions of gas tar is employed to replace the asphalt in the foregoing mixture; the product is called *artificial* or *gas-tar asphalt*.

Facti''tious Asphaltum (-tĭsh-'ŭs). *Syn.* ASPHAL'TUM FACTI''TIUM, L. That of the shops, when not an inferior kind of true asphaltum, is commonly made from the bottoms of *Barbadoes tar*, and other *mineral bitumens*, by heating them until quite hard. Sometimes a little *Scio turpentine*, *balsam of copaiba*, or even *common resin*, is added. Colour, hardness, &c., inferior to those of native asphaltum.

Liq'uid Asphaltum. *Syn.* PREPARED' ASPHALTUM; ASPHAL'TUM LIQ'UIDUM, L. *Prep.* 1. *Scio turpentine*, 2 *oz.*; melt; add *asphaltum* (in powder), 1 *oz.*; mix, cool a little, and reduce with hot *oil of turpentine*.

2. (Wilson's.) *Asphaltum*, $\frac{1}{4}$ *lb.*; melt; add of hot *balsam of copaiba*, 1 *lb.*; and, when mixed, thin it with hot *oil of turpentine*. Both are used as 'black japan' or 'varnish,' and as a 'glazing colour' by artists.

ASPHYX'IA (-fĭk'-sh'ă; -fĭks'-e-ă‡). [L., Gr.] *Syn.* ASPHYX'Y‡ (-e), Eng.; ASPHYXIE, Fr.; PULSLOSIGKEIT, SCHEINTOD, Ger. *Literally*, absence of pulse; hence, a fainting fit; apparent lifelessness. Its use is now generally confined to a suspension of vitality from some cause interrupting respiration, but in which *life is not actually extinct*, and may, under *favourable circumstances*, be revived.

Asphyxia is commonly divided into *varieties* by nosologists:—

1. ASPHYXIA AL'GIDA:—*Cause.* Ex to intense cold.—*Symp.* Countenance livid, and shrivelled; limbs rigid.

2. ASPHYXIA ELEC'TRICA:—*Cause.* of lightning or electricity.—*Symp.* C nance pale, limbs flexible, blood incoagu

3. ASPHYXIA MEPHIT'ICA:—*Cause.* lation of irrespirable gases or fumes.— Countenance pallid, lips wan, &c.

4. ASPHYXIA SUFFOCATIO'NIS:—*C* focation or strangulation, as from dr hanging, &c.—*Symp.* Countenance tur livid.

Treatm., &c. No general rules can be exactly suitable to each variety. Wh it is possible to procure medical aid, it s of course, be immediately sought; as the even a single minute may render it use In the *treatment* of suspended animati principal object is to effect a restoration respiratory and circulatory functions; former of which has been arrested by th ternal condition of the patient; the latt the contact of morbidly carbonised blood the capillary vessels of the lungs. The thing to be attempted, is the restorati warmth by active friction with the hands, flannels, &c.; the *second*, the re-estab ment of natural respiration by any avail means, of which, perhaps, none is simpl better than alternate pressure and its re tion, applied to the thorax and abdom as to induce expiration first, and inspir immediately afterwards, by the natural and elasticity of the ribs and diaphragm. water may also be suddenly dashed o face and general surface previously wa by the frictions, in the hope of induci more decided inspiration. If these mea fail, *artificial respiration* should be pro had recourse to. (Dr. Marshall Hall.) warm bath, and slight electrical shock continued streaming electricity, may al applied.

See CHARCOAL, COLD, DROWNING, HANG RESPIRATION (Artificial), SEWERS-GAS, ST GULATION, SUFFOCATION, &c.

ASPHYX'IATED. *Syn.* ASPHYXIA'TU ASPHYXIÉ, Fr.; ASPHYKTISCH, SCHEINT &c., Ger. Affected with or labouring u asphyxia. (See *above*.)

ASP'IC†. Spike lavender or French la der; also the *male lavender*, *spica nard pseudo-nardus* of old writers. See ASP.

Aspic. In *cookery*, "savory jelly extr from the succulence of meat." (Soyer.)

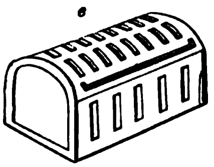
Prep. (Miss Acton.) *Calf's feet*, 2 in *veal*, 4 *lbs.*; *ham*, $\frac{3}{4}$ *lb.*; *onions*, 2 (lar *carrots*, 3; *water*, 1 gal.; boil 5 or 6 hour until reduced to less than one half, strain, when cold, put the jelly into a stew-pan the *whites* of 4 *eggs* well beaten, a large b of *savoury herbs*, 3 blades of *mace* (in shr a teaspoonful of white peppercorns, and

and silver in ores and alloys of these metals, in the 'dry way,' or by cupellation. It differs from chemical analysis in merely furnishing the quantity of the precious metal contained in the sample examined; instead of the nature and proportions of all, or any, of the ingredients in the compound, at the will of the operator.

Materials, Appar., &c. These are—*furnace, muffle, cupels, charcoal,* &c., all of which must be provided and properly arranged for use before an assay can be made:—

The **FUR'NACE** employed at the Royal Mint, and at Goldsmiths' Hall, London, is figured in section in the *engr.*, and has the following dimensions:—*Total height*, 2½ feet; from the *bottom* to the *grate*, 6 inches; *grate, muffle-plate,* and *bed of loam* that covers it, 3 inches; *space* between the grate and the bottom of the funnel or chimney, 21½ inches; *funnel*, 6 inches. A furnace of any other shape and size may be employed, provided it affords a sufficient heat, and allows of the easy introduction of the muffle.

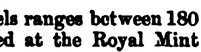
The **MUFF'LE** (mŭf'l) is a vessel made of clay (see *engr.*), and furnished with an opening to admit of the introduction of the cupels, and the complete inspection of the process. It is placed on the muffle-plate (see *above*), by which it is introduced into the furnace.



The **CU'PEL** (kū'-pĕl) is a small, porous, shallow crucible, usually made of bone ashes or burnt horn. The powder (slightly moistened with water), is placed in a circular steel mould, and after being pressed down tight, is finished off with a rammer having a convex face of polished steel, which is forcibly struck with a mallet, until the mass becomes sufficiently hard and adherent. The newly formed cupel is then carefully removed and exposed in the air for a fortnight, or three weeks, to dry. *Fig.* 3 represents a *cupel* in section, and *fig.* 4, the *tongs* used for charging it. The best weight for cupels ranges between 180 and 200 grs. Those used at the Royal Mint are made of the calcined cores of ox-horns.

3

4



Proc. of ass. The *muffle*, with the *cupels* properly arranged on the 'muffle-plate,' is placed in the furnace, and the charcoal added and lighted at the top, by means of a few ignited pieces thrown on last. After the cupels have been exposed for about half an hour, and have become white hot, t *below*) is put into them by means c As soon as this becomes bright red *lating*,' as it is called, the specime wrapped in a small piece of paper is added. The fire is now kept until the metal enters the lead an well, when the heat, slightly dimi regulated that the assay appears more glowing than the cupel itsel '*undulations*' circulate in all di the middle of the metal appears a margin of litharge which is fre by the cupel. When the metal be and shining, or, in technical lang to '*lighten*,' and prismatic hues su across the globules, and undulat each other, followed by the met very brilliant and clear, and at and solid (called the '*brightening* ration is ended and the process con cupels are then drawn to the m muffle, and allowed to cool slov quite cold, the resulting 'button,' is removed by the pliers or tong cupel, and after being flattened *anvil* of *polished steel*, with a p hammer, to detach adhering oxide cleaned with a small hard brush, *rately* weighed. The **WEIGHT** is **PURE SILVER**; and the **DIFFERE** the *weight of the alloy before cup* that of the *button of pure meta* the proportion of *alloy* in the samp (See *below*.) In the case of **GOI** ton' has to undergo the subseq tions of *quartation, parting*, an before it is weighed; as described metal.

Assayer's weights, &c. The ma in assaying are accurately weighed of the most susceptible descripti weights are given in terms of th employed by assayers. The '*fine ness*,' or 'degree of *purity*' of pressed in *carats*. Pure gold is 24 *carats fine*; and any other sam ing in 24 parts only 12, 18, 22, pure gold, is said to be of as many Every *carat* is nominally divided in *grains*,' each assay-grain into '*q* each quarter into '*eighths*' (= giving 768 "*reports*" for **GOLI** system fractional alloys are comm of as of so many '*carats* and *th* fine.' The real quantity taken for nically termed the '**ASSAY-POUND**,' very small, generally either 12 grs which makes each *assayer's eigh* "*report*," equal to either the $\frac{1}{2}$ Troy, as the case may be. The *sayer's gold carat* is 12 grs. Th *weight of gold*" is 15 lbs. Troy (reigns = 1402 half-sovereigns).

The '*fineness*,' 'richness,' or **SILVER** was formerly expressed

is now generally reckoned in
:h admits of greater accuracy.
s said to be "silver of 12 penny-
it contained 1, 2, or 3 parts of
termed "silver of 11, 10, or 9
," as the case might be. Every
yweight was nominally divided
ıd hence gave 288 fine grains, or
SILVER. The fineness of speci-
ing odd grains, was given in
and *fine grains*. The 'ASSAY-
silver, on this system, may be 24
n 2 real grains are equal to 1
ight,' and $\frac{1}{12}$ real gr. equal to 1
In the *decimal method* pure
)00. The usual weight of silver
e 'assay-pound,' when the fine-
sed in 1000ths, is 20 Troy grs.,
rain of which represents $\frac{50}{1000}$th
and so on of smaller divisions.
urneyweight of silver," is 60 lbs.
0 shillings, or a like value in other
s).

pellation, which is the distinctive
nportant operation in assaying
ver, is founded upon the feeble
h these metals have for oxygen,
n with copper, tin, and other
als; and on the tendency which
metals have to oxidise rapidly in
lead at a high temperature, and
it into any porous earthen vessel,
sy or vitriform state. The con-
ial to the success of the process,
found in the precious metals, are
netal from which we wish to part
ust not be volatile;" and that
o melt and form a button at the
ellation; for otherwise it would
minated, attached to the portion
d over the cupel, and incapable
cted."[1]

' *remarks*. The art of assaying
great care, skill, and experience,
ercise; and from the costliness of
metals, and their general employ-
n, jewelry, plate, &c., is of the
rtance both to individuals and

in the cupel, adding a little powdered charcoal or a few small pieces of paper, and continuing the heat until the metal 'brightens' and 'circulates' freely. The lead employed must be absolutely pure, or that technically called '*poor lead*;' and, for this purpose, is commonly prepared by the reduction of refined litharge mixed with some carbonaceous matter, by heat; but, according to the late T. H. Henry, "lead reduced from the litharge of commerce usually contains from 10 to 15 *dwt.* of silver per ton." These remarks apply equally to gold and silver.

The process of assaying by the cupel, however skilfully conducted, gives much less accurate results, especially with silver, than the method of chemical analysis, often termed '*humid*' or '*volumetrical assay*;' whilst it is, in all cases, much more troublesome and expensive, and with compounds containing only small quantities of the precious metals, is not to be depended on. See GOLD, SILVER; also CARAT, CUPELLATION, PARTING, LIQUATION, QUARTATION, REFINING, &c. (and *below*).[2]

Assay of the Touch. The fineness of JEWELRY, and of small quantities of GOLD which it is either impossible or inconvenient to assay according to the usual method, is generally determined by means of *touch-needles* and *touch-stones*. The former are made in sets, containing gold of different degrees of fineness, and differently alloyed with copper and silver. The latter are usually of black basalt; but pieces of good black pottery answer the purpose very well. The mode of using them is to mark the stone with the sample under examination, and to compare its appearance, hardness, colour, &c., with that produced by one or more of the needles. When the two are similar, the quality or 'fineness' is considered to be the same. The marks are then further examined by heating the 'touch-stone' to redness, and moistening the strokes with *aquafortis*, when the appearances resulting from oxidation, &c., differ according to the nature and quantity of the alloy. A nearly similar method is sometimes adopted with SILVER; but the characteristics are scarcely so distinct

ASTHEN'IC. *Syn.* ASTHEN'ICUS, L.; ASTHÉNIQUE, DÉBILE, Fr.; SCHWACH, Ger. Weak; debilitated. In *pathology*, an epithet of diseases (ASTHEN'IC DISEASES) accompanied by great and well-marked debility.

ASTHEN'OPY. *Syn.* ASTHENO'PIA, L. In *pathology*, incapacity to keep the eyes fixed on near or small objects for any length of time without confusion of vision. The common causes are over-exertion of the eyes, particularly by artificial light, or by a very brilliant one, or during convalescence; congestion of the ocular vessels; debilitating discharges or indulgences; and general nervous debility, however produced. It "appears to consist in weakness of the apparatus by which the eye is adjusted for the vision of near objects;" and along with this "there is an irritable state of the retina, connected in some manner with a tendency to internal congestion of the eyes."[1] The *treatment* may consist of rest to the eyes, and ablution of them in cold water, with such other efforts to restore their tone and the general health as are noticed under AMAUROSIS. The prospect of complete cure, when the cause is not removable, is unfavorable; but even when confirmed the disease is not likely to end in blindness. The use of *convex spectacles* of *very low power* will generally be found serviceable. See EYE, SPECTACLES, VISION, &c.

ASTH'MA (ăst'-mă[2]). [Eng., Ger., L., Gr.] *Syn.* ASTHME, Fr.; ENGBRÜSTIGKEIT, Ger. In *pathology*, a well-known disease coming on by fits, and characterised by shortness and difficulty of breathing, accompanied by a wheezing sound, cough, stricture and tightness of the chest, with other like symptoms. These gradually increase until the patient can no longer remain in a recumbent position, being, as it were, threatened with immediate suffocation; and they generally terminate, after the lapse of a few hours, in copious expectoration. The attack usually commences towards evening, and the symptoms increase in urgency during the night—often occurring suddenly after the first sleep—until at length, on the approach of morning, a remission takes place, and, in all probability, the patient, worn out and exhausted, falls into a sound sleep. On awaking in the morning he still feels the 'tightness' at the chest, breathes with some difficulty, which is increased by moving, and cannot lie in bed unless his head and shoulders are greatly raised. After a repetition of the fits for some nights, they at length moderate, and after more considerable remissions, pass off at last, leaving the patient in his usual state of health for a time, or until fresh exciting causes produce a return of the disease. For an evening or two previous to the fit, the patient generally feels drowsy, indolent, and low-spirited, and experiences a sensation of fulness about the
stomach, with headache, general u
and indigestion—these are the pr
symptoms.

Asthma is principally confined to
periods of life, and appears in many
be hereditary. It is generally seve
heat of summer, or in the foggy or
windy weather of winter. The fits
duration from two to several hours,
times copious expectoration comme
which has led to the division of as
nosologists, into two kinds—*dry*, an
spasmodic asthma (ASTHMA SIC'CUM,
humid a. (A. HU'MIDUM, L.).

The *exciting causes* of asthma are
to sudden changes of temperature, pa
from heat to cold; unwholesome eff
drinking, heavy meals, indigestion, vi
ercise, and cold, damp, foggy, and s
windy weather.

Treatm. A dry, warm, and airy sit
a residence, should, if possible, be soug
use of flannel next the skin, and tepid
bathing is also advantageous. Th
should be kept regular by mild aperi
the stomach preserved in order by the
of a light and wholesome diet; pa
avoiding excess in either eating or
The severity of the paroxysm may be
lessened by adopting the sitting po
inhaling the vapour of hot water
infusion of chamomile. Small doses
phor, ether, and opium, frequently
may also be tried. The inhalatio
vapour of a little tar liquefied by he
to often produce considerable reli
fumes arising from the slow comb
porous paper dipped in a solution of
dried, have also been recommende
fumes of a piece as big as one's ha
placed on an earthenware plate, and
presently become sensible throug
room; and within a quarter of an
influence, in many cases, is rendered
in clearing the passages, and gradu
ing the air-tubes." "Of calming va
of chloroform is, however, the one
respect of its soothing power, to sup
others. Inspired in moderate qua
less than is requisite to produce g
sensibility, it has been found of sin
cacy in allaying, at once, the spasmodi
of an asthma-fit. But it is a re
potent and subtle to be intruste
discretion of the patient himsel
Watson); unless, indeed, he well un
its properties and nature, and has so
near him to restrain his using it too
thing he is, unfortunately, often te
the urgency of the symptoms, to do.
ing is an imprudent operation in eve
of asthma" (Dr. Bree); and has ofte
highly injurious, especially in elderl
It is only in full plethoric habits,
the paroxysms are very severe, and
with signs of congestion of the

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[1] T. W. Jones, "*Defects of Sight;*" Lond., 1856; p. 82.

[2] *Asth'ma (with th fully sounded)*, as given by Knowles, *is difficultly pronounceable*, and is now obsolete.

altitude. Thus, if at a given altitude the density of the air is only one half what it is at the level of the sea, at twice that elevation it possesses only one fourth that density. On this fact depends the application of the barometer to the determination of the elevation or depression of any point above or below the level of the sea, taken as a standard.

Density of the Atmosphere at Different Elevations. By Prof. Graham.

Height above the level of the Sea in miles.	Volume of Air.	Height of the Barometer.
0·	1	30
2·705	2	15
5·41	4	7·5
8·115	8	3·75
10·82	16	1·875
13·525	32	·9375
16·23	64	·46875

Height, &c.:—If the density of the air were uniform throughout its whole extent, the height of the atmosphere, measured by a corresponding column of mercury, would be barely 5½ miles. As, however, its density decreases with the distance from the earth's surface, its real height must be considerably greater. Kepler found that the reflection and refraction of the sun's rays by the atmosphere, producing twilight, ceases when that luminary descends 18 degrees below the horizon; whence it is calculated that the atmosphere cannot have a greater altitude than 45 miles. On the other hand, there is reason to believe that it cannot be much less than this sum. "With a good air-pump air may be rarefied 300 times; supposing this to be the utmost limit to which rarefaction can be carried, the atmosphere would still extend to an altitude of above 40 miles." Whether, in a state of extreme tenuity in which its grosser properties are lost, it extends indefinitely into space, was formerly a subject of controversy. That its boundaries are limited, and that it belongs exclusively to our earth, appears almost certain. "We are warranted in concluding that the atoms of air are not infinitely divisible, and consequently, that the atmosphere has a limit; and the limit must be situated at that height above the earth, where the gravitation of the atoms is just equal to the force of their repulsion."[1] Under ordinary circumstances the mercury of the barometer falls about one inch for every 1000 feet of elevation.

Pressure:—The weight or pressure of the atmosphere is shown by the rise of water in the barrel of the common 'lifting pump, and the suspension of the mercurial column in the tube of the barometer. The last affords a ready means of determining the actual pressure of the air; the column of mercury, and the column of air by which it i
resembling two weights in equili
opposite extremities of the sa
The mean height of the barometa
of the sea, in England, is 28·6 incl
33⅓ feet of water); and as a c
mercury weighs 3425·92 grs. o
it follows that the weight of a col
cury whose base is a square incl
avoirdupois. The pressure of the
is not merely downwards, but is
fused in all directions, and ex
powerful effect in the economy
beings. On the surface of the bod
of ordinary size (say = 15 sq. f
inches), it amounts to the enormo
31,536 *lbs.*, which is not sensible,
it is balanced by the force of the
in the interior of the body. We
librium to be suddenly destroyed
quence would be, either that the
be instantly torn to pieces with e
lence, or that it would be crushe
overwhelming weight that wou
fall upon it. Even the compara
variations of atmospheric pres
occur with changes of wind, w
season, exercise a perceptible ef
functions of life.

Mean pressure of the Atmosphere
of the Sea, in different latit
Fahr., *expressed in inches of me*

Lat.	Height (inches).	Lat.	Height (inches).	La
0°	29·930	40°	30·019	54
10	29·975	45	30·000	60
20	30·064	49	29·978	64
30	30·108	51½	29·951	67

Temperature:—The *tempera*
atmosphere, independently of cha
from variations of latitude and
minishes, like its density, with
In general, every 100 yards of a
the temperature to fall 1° Fah
(Atmospheric), Epidemics, Venti

Atmosphere. In *engineering* and
the pressure of a column of me
Cent. or 32° Fahr., which is 76 ce
29·9218 inches high, at the mean
sea in latitude 45°, taken as a
that exerted by other elastic fluid
tice this is assumed to be 15 *lbs.* t
inch, under a barometrical pres
inches. Thus, *steam* or *air* conde
exert a pressure of 30 *lbs.* per sq.
to be of *two atmospheres*; at 45
atmospheres, &c.

AT'OM (·ŭm). **Atomic Wei**
Theory. *Syn.* At'omus, L.; A
Atom, Untheilbare theilchen,

Atomic Weight. When the el
chemically, they invariably do so i

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[1] *Brande's "Dict. of Lit., Sci., & Art."*

the whole body. GEN'ERAL ATROPHY appears to depend on deficient nutrition, arising from a want of due balance between the functions of assimilation and absorption, or from profuse evacuations draining off the materials necessary for the support of the body. In the former case only may it be regarded as an independent disease. LO'CAL ATROPHY commonly arises from some cause which lessens the normal circulation of blood in the part; or from a diminution of the nervous influence, as in paralysis. *General atrophy* is most frequent in infancy, childhood, and old age. In the *first two* it may be often traced to bad nursing, worms, or a scrofulous taint; and not unfrequently, to continually inhaling impure or damp air. In *adults*, the causes are impaired digestion and imperfect action of the chyliferous organs, and sometimes diseased action of the liver. In many cases it results from the use of tobacco.

Treatm. This consists in a close attention to diet (which should be liberal and nutritious), exercise, clothing, ventilation, warmth, &c., with gentle stimulants, and chalybeate tonics where not contra-indicated; and, in the case of adults, the moderate use of pure generous wine or malt-liquor. Among special remedies, both in this disease and *anæmia*, may be mentioned pure sweet *cod-liver oil*, which seldom fails to arrest or greatly retard the progress of the disease, and in very many cases effect an entire cure. When this affection is symptomatic of any other disease, as worms, stomach or liver complaints, &c., the removal of the latter must of course be first attempted. See ANÆMIA, CHLOROSIS, TABES, &c.

ATRO''PIA (trōpe'y'ă). $C_{34}H_{23}NO_6$. [L.; B. P.] *Syn.* AT'ROPINE (-pĭn; sometimes *atro'pine*‡), Eng., Fr.; ATROPI'NA, ATRO''PIUM*, L. An alkaloid discovered by Brandes in *at'ropa belladon'na* or deadly nightshade.

Prep. 1. (B. P. Process.) Take of *belladona root*, recently dried, and in coarse powder, 2 *lbs.*; *rectified spirit*, 10 *pints*; *slaked lime*, 1 *oz.*; *diluted sulphuric acid*, *carbonate of potash*, of each, a sufficiency; *chloroform*, 3 *fl. oz.*; *purified animal charcoal*, a sufficiency; *distilled water*, 10 *fl. oz.* Macerate the root in 4 pints of the spirit, for 24 hours, with frequent stirring. Transfer to a displacement apparatus, and exhaust the root with the remainder of the spirit by slow percolation. Add the lime to the tincture placed in a bottle, and shake them occasionally several times. Filter, add the diluted sulphuric acid in very feeble excess to the filtrate and filter again. Distil off three fourths of the spirit, add to the residue the distilled water, evaporate at a gentle heat, but as rapidly as possible, until the liquor is reduced to one third of its volume and no longer smells of alcohol; then let it cool. Add very cautiously, with constant stirring, a solution of carbonate of potash so as nearly to neutralise the acid, care, however, being taken that an excess is not used. Set to rest for six hours, then filter, and add carbonat in such quantity that the liquid s a decided alkaline reaction. Place with the chloroform; mix well by repeated brisk agitation, and pou liquids into a funnel furnished stop-cock. When the chloroform h draw it off by the stop-cock, and d water bath from a retort conne condenser. Dissolve the residue i tified spirit; digest the solution animal charcoal; filter, evaporat until colourless crystals are obtain

2. *Expressed juice of bellado* porated over a water bath to ence of an extract, and then tri marble or porcelain mortar with s lution of caustic potassa; the res is digested and well agitated for at the temperature of 75° to 80° benzole, q. s.; and, after repose, solution is carefully separated, and hydrocarbon is distilled off by th water bath; the residuum in the r exhausted with water acidulated wi acid, and the resulting 'acid-sol filtration, precipitated with *carbo* the precipitate is crude ATROPIA, lected on a filter, pressed betw bibulous paper, and dried; after purified by one or more re-solution and crystallisations, which may or modified in the manner noticed. tion of potassa should be about 1 quart of the expressed juice. A and economical process. The pr to ·4⅝ of the weight of the plant the juice has been obtained.

3. (Mein and Liebig.) *Belladonn* dried and coarsely powdered), is *alcohol* (sp. gr. 0·822); *slaked lim* every 24 of the dried root emplo added to the tincture, and the wh with agitation, for 24 hours; *su* is next added, drop by drop, to sl and, after filtration, rather more t the spirit is removed by distillat water is now added to the resid remainder of the alcohol evaporat as possible by a gentle heat; aft tering, the liquid is reduced by fu ration to the $\frac{1}{12}$th part of the w root employed, and a concentrate potassa dropped into the cold liqu down a dark greyish-brown matt avoiding excess or rendering the slightest degree alkaline; in a fe liquid is again filtered, and carb tassa added as long as a precipitat falls; after a further interval of 24 hours, this precipitate is c drained in a filter, and after press folds of blotting paper, dried by heat. It is purified by making it with water, again squeezing it folds of blotting paper, drying

of a grain accelerates the pulse, affects the brain, causes dryness of the throat, difficulty of deglutition, dilation of the pupil, dimness of sight, giddiness, strangury, numbness of limbs, sense of formication in the arms, rigidity of thighs, depression of pulse, and sometimes feebleness or loss of voice. These symptoms continue for from 12 to 24 hours. In larger doses death ensues.

Ant., *&c.* These may be similar to those described under BELLADONNA and ALKALOID.

Uses. Chiefly as an external agent, as a substitute for belladonna, to cause dilation of the pupil; and as a local anæsthetic or anodyne, especially in facial neuralgia. Internally, it has been occasionally given in hooping-cough, chorea, and a few other nervous diseases.—*Dose.* $\frac{1}{80}$ gr., gradually increased to $\frac{1}{30}$, or occasionally, even $\frac{1}{10}$ gr. in solution, or made into a pill with liquorice powder and honey, or syrup, or used endermically; for a collyrium, 1 gr. to *water* 1 oz., a few drops only being applied to the eye at a time; the greatest caution in each case being observed. It is also employed to make the sulphate. In dispensing it, a single drop of acetic acid, or dilute sulphuric acid, will be found to facilitate and ensure its perfect solution. See BELLADONNA and BELLADONINE.

Atropia, Sul'phate of. *Syn.* ATRO'PIA SUL'PHAS, L. *Prep.* (B. P.) Take of *atropia*, 120 *grs.*; *distilled water*, 4 *fl. drs.*; *diluted sulphuric acid*, a sufficiency.

Mix the atropia with the water and add the acid gradually, stirring them together until the alkaloid is dissolved and the solution is neutral. Evaporate it to dryness at a temperature not exceeding 100°.

Characters and Tests.—A colourless powder, soluble in water, forming a solution which is neutral to test-paper, and when applied to the eye dilates the pupil as the solution of atropia does. It leaves no ash when burned with free access of air.

Intended for external application. It is a powerful poison.

Uses, &c. The same as those of the pure alkaloid.—*Dose.* $\frac{1}{25}$ to $\frac{1}{20}$ gr., either in solution or pills; 1 to 3 gr., to water, 1 fl. oz., as a collyrium, of which a few drops seldom fail to produce full dilation of the pupil in about a quarter of an hour; 1 to 2 grs., to lard, 1 dr., forms an excellent ointment in neuralgic affections.

Obs.. Sulphate of atropia (which is intended for external use only) is rather difficult to crystallise, as it has a tendency to assume an amorphous or gum-like condition. It is more soluble than the pure alkaloid; and like it, is a terrific poison.

ATROP'IC ACID. *Syn.* ACIDUM ATROP'ICUM, L. The name given by Richter to a volatile crystallisable substance, possessing acid properties, found in *atropa belladonna* or *deadly nightshade*. In many respects it resembles benzoic acid, from which, however, it is distinguished by not precipitating the salts of iron.

ATROPI'NA, At'ropine. See ATROPIA.

AT'TAR. See OTTO and VOLATIL

ATTELETTES (-lĕts'). [Fr.] In small skewers, generally of silver, w mental heads. The term is also appli dishes (ENTRÉES, &c.) in which the mounted on attelettes. Small fish, are often served in this way. See AIGU

ATTEN'UANT (-ū-ănt). *Syn.* AT L.; ATTÉNUANT, Fr.; VERDÜNN That makes thin, or less dense or vi luting. In *medicine*, applied to rem TEN'UANTS, SPANÆM'ICS) which are to act by thinning, diluting, or impo the blood.

ATTENUA'TION. *Syn.* ATTENUA ATTÉNUATION, Fr.; VERDÜNNUNG, thinning or diminishing; a reducing sistence. In *medicine*, see the *adj.* in *brewing*, the decrease of the d worts during fermentation, arising f gradual conversion of their '*saccharine*' into alcohol. See BREWING, DISTIL WORTS, &c.

ATTRAC'TION. [Eng., Fr.] *Sy* TRAC'TIO, L.; ANZIEHUNG, Ger. Th that draws together matter and re separation. That force which attracts towards the centre of the earth, and keeps on its surface those that are no called GRAVITY, or the *attraction of g tion*. It is exerted at sensible, often mense, distances, and determines the and motions of the planets and co causes the descent of heavy bodies ground. This force it is which co property of weight upon matter.

That force which unites particles of *same kind* of matter, so as to cause th assume the condition of solid or liquid *e.g.* particles of chalk to form a mass of particles of water to form a mass of w called COHESION, or the ATTRACTION O HESION. That force which binds to *different* substances without changing properties, as when paint sticks to woo to paper, &c., is called ADHESION, or t TRACTION OF ADHESION. CAPILLARY A TION is a modification of *adhesion*, characterised by being exerted between and the internal surfaces of tubes and p bodies. The absorption of water by a the ascent of oil in the wick of a la examples of this power. The CHEMICAL or AFFINITY differs from all other attraction in being exerted between and constant quantities (*atoms*) of usually of dissimilar natures, and P combinations possessing properties from those of their components. FINITY.) This force, as well as coh adhesion, is exerted at distances so to be immeasurable.

The terms ELEC'TRIC ATTRACTION NET'IC ATTRACTION are employed to denote phenomena which we understand, and which operate bet are kept, or bred, on account of their rarity, plumage, or song; and not for food.

Situ., *&c.* For exotic birds, a place should be selected where the temperature can be maintained at a proper degree throughout the year, and which is well protected from the weather. This is commonly done by choosing a space attached to the summerhouse or hothouse. When the aviary is only intended for birds of climates similar to our own, any part of the open garden may be chosen, and a portion closed in, either with trellis-work or wire-work, or netting; care being taken to provide, in some easily accessible portion of it, full protection from vicissitudes of weather and season. Nor must cleanliness, and due ventilation and protection from foul air or noxious fumes, be left unattended to.

AVIGNON' BER'RIES (ăv-veen-yo*ng*). French berries.

AV'OIRDUPOIS' (ăv-ĕr-du-pois'). The common weight of 16 *oz.* or 7000 grs. to the lb., used in these realms for all kinds of goods, except jewelry and the precious metals, and medicines in dispensing, or as ordered in the 'British Pharmacopœia' of 1867.

AX'IS. [L., Eng., Fr.] *Syn.* Axe, Fr.; Achse, Ger. *Primarily,* that on or around which anything acts or performs; an axle or axle-tree. In *anatomy,* that on or around which any organ or part rests, gravitates, or centres. In *astronomy,* the diameter on or about which a celestial body revolves. In *botany,* part or parts about which particular organs are arranged; an imaginary line passing from the base to the apex of a pericarp, &c. In *crystallography,* imaginary lines passing through the central points of a crystal, and about which the molecules or particles of matter composing it may be conceived to be symmetrically built up. In *geology,* the centre of a mountain-group. In *mechanics,* the straight line, real or imaginary, about which any body oscillates or revolves. See Crystal, &c.

AX'LE, Ax'le-tree (ăks'l). *Syn.* Essieu, Fr.; Axe (am rade), &c., Ger. In *mechanics,* the pin, rod, or material line, on which a wheel, &c., turns. See Anti-attrition, Friction, &c.

AX'UNGE (-ŭnje). *Syn.* Axun'gia, L. *Primarily,* 'wheel-grease;' the lard or fat of an animal; restricted in *pharmacy* to hog's lard.—Axungia cura'ta, A. præpara'ta, is prepared or washed hog's lard (which *see*).

AZADIRACHTA INDICA. (Ind. Ph.) **Nim or Margosa Tree.** (Ind. Ph.) *Habitat.* Common throughout India; often cultivated in gardens. *Officinal parts.*—1. The bark (*Azadirachtæ cortex, Nim bark*). It varies much in appearance, according to the size and age of the tree producing it. The bark from the trunk of a tree above three or four years of age is covered with a thick scaly epidermis, and varies in thickness from ¼ to ½ inch. *That from the smaller* branches is smooth, of a dullish purple colour, marked
dinal lines of ash-coloured epidern
to $\frac{1}{12}$th of an inch apart. The i
the bark, of a whitish colour in th
is powerfully bitter, far more
outer dark-coloured layer, whi
possesses a greater amount of
It contains a crystallisable pri
gosine) and an astringent princip
—2. The fresh leaves (*Azadirach*
leaves).—*Properties.* Bark, ast
and antiperiodic; leaves, stimul
peutic uses. In intermittent a
roxysmal fevers, in general debi
valescence after febrile and other
bark has been employed with
leaves form a useful application
skin diseases when a mild stin
quired.—*Dose.* Of the powdered b
three or four times a day.

Preparations. Decoction o
(Decoctum Azadirachtæ). Take
layer of *nim bark,* bruised, 2 *oz.;*
and a half. Boil for 15 minute
whilst hot.—*Dose.* As an anti
1½ to 3 *fl. oz.*, every second hour
expected paroxysm. As a tonic,
twice or thrice daily. As this d
decomposes in hot weather, it s
pared fresh for use when require

Tincture of Nim Bark (Ti
rachtæ). Take of the inner laye
bruised, 2½ *oz.*; *proof spirit,* 1
rate for seven days in a close
occasional agitation; strain, pre
add sufficient proof spirit to ma
may also be prepared by perco
same manner as Tincture of C
—*Dose.* From ½ to 2 *fl. drs.* as

Poultice of Nim Leaves
Azadirachtæ). Take of fresh
sufficiency; bruise and moiste
water. A good stimulant applic
lent and ill-conditioned ulcers.
cause pain and irritation, as it so
equal parts of rice-flour and lin
be added. The bitter oil of the
in high repute by the natives as
tic, and as an external applicati
tism. It is also said to be an in

AZOERYTH'RYN (-rĭth'-rĭn).
obtained, by Kane, from *archil.*
ble in alcohol, ether, and water
soluble in alkaline lyes, to whic
port-wine colour.

AZO'IC. *Syn.* Azöot'ic; Azo'
cus, &c., L. Lifeless; wholly
organic life. In *geology,* &c., ap
which do not contain organic re

AZOLIT'MIN (ăz-o-lĭt'-mĭn).
substance obtained, by Kane, fr
which it forms a large portion
ing matter. It is insoluble in a
water unless alkalised.

AZ'OTE* (ăz'ōte; a'-zōte).
Syn. Azo'tum*, L.; Azot*,

posed of wood-dust and lime, slaked together, stone powder, and a little ochre, umber, or sienna; the whole being mixed up with weak alum water to the consistence of paint, and laid on in dry weather.

BAEL. [Nat.] *Syn.* Indian baël, Bel*; Ba'el, B. in'dicus, Be'la, B. in'dica, L. The *ægle marmelos* (Correa; *cratæva m.*, Linn.) one of the Aurantiaceæ (DC.). Dried half-ripe fruit imported from the E. I., under the name of Indian bael. Astringent and refrigerant; highly extolled in chronic dysentery, diarrhœa, English cholera, and relaxations generally. It is also used in bilious fevers, hypochondriasis, melancholia, &c. *Root-bark*, *stem-bark*, and *expressed juice* of the *leaves*, particularly the first, also used in the same cases in India. *Ripe fruit*, fragrant and delicious; used, in the E. I., as a warm cathartic, and regarded as a certain cure for habitual costiveness. *Mucus* of the *seeds* used by painters as size; also as a cement. *Unripe fruit* used to dye yellow. It is generally administered under the form of decoction or extract (which *see*).

BAGASSE' (-găs'). [Fr.] The dry refuse stalks of the sugar cane as they leave the crushing-mill.—*Used* as fuel in the colonial sugar-houses.

BAGG'ING. The cloth or materials of which bags or sacks are made. In *agriculture*, applied to a method of reaping corn by a chopping, instead of a drawing cut. See Rats, &c.

BAIN-MARIE. [Fr.] In *old chemistry*, a water bath; also, sometimes, a sand bath. In *cookery*, a shallow vessel containing heated water, in which saucepans, &c., are placed, when it is necessary either to make them hot, or to keep them so, without allowing them to boil. It is extremely useful in making sauces, warming soups and small dishes, and when dinners are delayed after they are ready to serve.

BA''KING (bāke'-). *Syn.* Action de cuire au four, Fr. The process of cooking, or of heating, drying, and hardening any substance in an oven or kiln, or by the rays of the sun; the art or trade of a baker ‡; also technically, a batch or ovenful, or the quantity baked at once (= fournée, Fr.).

In *cookery*, baking is, perhaps, of all others, the cheapest, most convenient, and best way of dressing dinners for small families, where a good domestic oven is at hand. Though the flavour of baked meat is generally considered barely equal to that of the same parts roasted, there are some joints and dishes to which it appears particularly suitable. Among these may be mentioned *legs* and *loins of pork*, *legs* and *shoulders of mutton*, *fillets of veal*, &c. A *baked pig*, if it has been occasionally basted, and the heat has not been too great, eats equal to a roast one. *Geese* and *ducks* treated in the same way are also excellent. A *baked hare* which has been basted with raw milk and butter, also eats well; and so do various pieces of beef, especially the buttock. Cooks tell us that this last should be sprinkled wi
salt for a day or two before dressing
after being washed, is preferably ba
with about a pint of water, in a gla
pan tied over with writing paper
four times thick.' A *baked ham* is
preferable to a boiled one; to be
fuller of gravy, and finer flavoured.
be soaked in water for about an ho
dry, and covered with a coarse thin
batter. *Ordinary dishes* require simi
ment in baking to that given the
roasted.

For *domestic use*, where the kitch
does not include a really good oven,
able articles known as a 'Dutch-ov
an '*American-oven*,' form an excell
stitute, admirably adapted for smal
poultry, &c., all of which, when these
are skilfully employed, possess a deli
flavour fully equal to the same when
whilst not more than one half the f
quired for the purpose. According
Acton, they also "answer excellently
cate sweet puddings, and for cake
Bread, Cakes, Roasting, &c.

Baking Pow'der. See Powders.

BAL'ANCE. [Eng., Fr.] *Syn.* B
Bi'lanx, L.; Bilanz, Wagen, &
Balanza, Sp. Any weighing machi
acts by equipoise; a pair of scale
Scales, Weighing, &c.

Hydrostat'ic Balance. See Specific G

Tor'sion Balance. A delicate inst
invented by Coulomb, for measuring th
sities of the electrical and magnetic f

BALD'NESS (bawld'-). *Syn.* Ca
Calvi''ties (-vĭsh'-e-ēz), L.; Calviti
veté, Fr.; Kahlheit, Kahlkopf, K
figheit, Ger. *Primarily*, absence or
any natural covering; *appr.*, destit
loss of hair, more especially of that of
and fore-part of the head. In *botany*,
of beard or awn.

Grey hair and baldness dependen
age are natural consequences of man'
ity, and must be regarded as evidence
ing vigour, rather than in the lig
disease. *Premature loss* of *hair* ma
duced by various causes. It is comm
severe fevers, and is frequently ca
external pressure, friction, or violence
such other local actions and conditio
when long continued, interrupt the
functions of the skin. Persons wit
sumptive, scorbutic, scrofulous, or
taint, or of a general bad habit of
quently lose their hair early. In th
it probably arises from debility or pa
the cutaneous vessels, and the conse
sufficient nutrition of the hair-bulbs
it occurs in persons under the middle
apparently enjoying good health, it
often traced to the pernicious practic
stantly wearing a hard non-ventilati
to disordered stomach, habitual

lighter than common air), will, therefore, have an ascensional force of $\frac{1}{30}$ *lb.* Now the weight of the body of air which a balloon displaces must exceed the gross weight of the balloon and all its appendages, in order for the latter to ascend in the atmosphere. The difference of the two weights expresses the ascensional force. The aërostatic power of balloons is proportional to their dimensions, in the ratio of the cubes of their diameters. Thus, it appears that a balloon of 60 feet diameter filled with common hydrogen will ascend with a weight of nearly 7000 *lbs.*, besides the gas case; whilst one of only 1½ foot in diameter, will barely float, owing to the less proportionate volume of gas to the weight of the case containing it. In round numbers the buoyancy of a balloon may be reckoned as equal to 1 *oz.* for every cubic foot of hydrogen it contains, *less* the weight of the case and appendages. The carburetted hydrogen supplied by the gas-works is much heavier than hydrogen gas, and consequently much less buoyant, for which due allowance must be made. That which possesses the least illuminating power is the lightest, and consequently the best adapted for aërostation.

The fabric of which the cases of air-balloons are made is strong thin silk, covered with an elastic varnish of drying oil or india-rubber, or, what is better, a solution of india-rubber in either chloroform or bisulphide of carbon; the netting is of strong light silk or flaxen cord; and the car, of basket-work. Fire-balloons, on the small scale, are generally made of silver-paper, and are inflated with the fumes of burning spirit of wine, by means of a sponge dipped in that liquid, and suspended just within the mouth of the apparatus.

Owing to the increasing rarity of the atmosphere as we ascend from the earth's surface, balloon cases are made very much larger than is required to contain the necessary quantity of gas, to allow for its expansion as it rises into a rarer medium. A cubical foot of gas measured at the level of the sea, occupies a space of two feet at an elevation of 3½ miles.

The following *Table* will prove useful to the amateur aëronaut or balloonist:—

TABLE *showing the relations between the diameters, surfaces, and capacities of spheres.*

Diameters.	Surfaces.	Cubical contents.
1	3·141	·523
2	12·567	4·188
3	28·274	14·137
4	50·265	33·51
5	78·54	65·45
10	314·159	523·6
15	706·9	1767·1
20	1256·6	4189·
25	1963·5	8181·
30	2827·	14137·
40	5026·	33510·

See ATMOSPHERE, GAS, HYDRC
CHUTE, VARNISH, &c.

BALLOON'ING‡. *Syn.* BALLOO
act, art, or practice of ascending
in balloons; aërostation. A BAL
an aëronaut (particularly an am
thusiastic one).

BALLS. The application of
commerce, perfumery, veterinary
has been already noticed. (See
following may be inserted here:—

Balls, Al'mond (ah'-mŭnd).
D'AMANDE, Fr. *Prep.* 1. *Sper*
white wax (pure), 8 *oz.*; *oil o*
pint; melt them together in a gl
ware-vessel, by the heat of a wat
when the mixture has cooled
essential oil of almonds, and *exp*
mace, of each, 2 *drs.*; stir assidu
begins to cool, and then pour
moulds, which may be ounce-g
smooth bottoms (very *slightly* w
it will form beautiful hemisph
Very fine.

2. Hard *clarified suet*, 1½ *lb.*
½ *lb.*; *ess. oil of almonds*, 1½ *dr.*;
(or of *pimento*), ½ *dr.*; as before.

Uses, &c. To soften the
winter, to prevent chaps and chilb
times these balls are coloured,
whilst the mixture is in the liq
rich PINK or RED may be give
alkanet-root or *dragon's blood*;
palm oil or *annotta*; a BLUE, by
powdered indigo; and a GREEN,
(steeped in the oil before use), or
of *verdigris*. The most approp
them is a pale yellow or amber.

Balls, Barèges (-rāzhe'). *Syn*
BARÈGES, Fr. *Prep.* 1. *Extract*
3 *oz.*; *good glue* or *gelatin* 1½
oz.; dissolve with heat, and add
calcium, 6 *oz.*; *common salt*, 1
powder); mix thoroughly, and f
into balls weighing 2½ *oz.* each, a
powdered gum, if required, to th
using *powdered starch* to roll the

2. *Gelatin*, 8 *oz.*; *sulphide of c*
common salt, 2 *oz.*; *water*, q. s.;
and admixture, add *carbonate*
Castile soap, of each (in powder)
ball is added to the water of a
adult, to be used as a substitut
Barèges.

Balls, Bitter. *Prep.* 1. *Powd*
2 *lbs.*; *extract of gentian*, 1 *lb.*;
radise (ground), ½ *lb.*; *syrup*, q.
heat, and divide into half-poun
ALE.

2. To the above add of *Spanish*
previously softened with a little
For PORTER and STOUT. Both
fraudulent brewers; and by pub
ducing their beer.

Balls, Black'ing. *Prep.* 1. (Ba
tragacanth, 1 oz.; water, 4 oz.;

esady. 4 *oz.*; and afterwards, *ivory-*
nd *Prussian blue* (in very fine
of each, 2 *oz.*; *neat's foot oil*, 2 *fl.*
oughly incorporate, and evaporate by
heat, constantly stirring, until of a
nsistence, then pour it into oiled

-*arabic*, *moist sugar*, and *ivory-black*,
lb.; *lamp-black*, ¼ *lb.*; *glue* (melted
tle water), 2 *oz.*; *water*, 1 quart, or
t's foot oil, ½ pint; as before.—*Used*
hoemakers, harness-makers, &c., to
nd polish leather. See HEEL BALLS.

Breech'es. *See* SCOURING BALLS.

Bronze. *See* COPYING BALLS.

Cam'phor. *Syn.* CAM'PHOR-CAKES,
LLS‡, CHIL'BLAIN B.‡, &c.; GLOB'ULI
A'TI, PLACEN'TÆ CAMPHORA'TÆ, &c.,
. 1. *Spermaceti* and *white wax*, of
z.; *almond* or *olive oil*, ¼ pint; melt
by a gentle heat, add of *camphor*
l pieces), 1 *oz.*; when dissolved, stir
rtly cold, and then pour it into
as directed under ALMOND-CAKES

rified suet, 1 *lb.*; *spermaceti* and
x, of each, 3 *oz.*; *camphor*, 2 *oz.*; as

rmaceti cerate (Ph. L.), 1 *lb.*; *sper-*
l *oz.*; *camphor*, 1½ *oz.*; as before.
either of the above add of *balsam of*
to ½ *oz.*; and, after solution, either
e mixture through muslin, or allow it
, and decant the clear portion from
s.
re. A popular preventive of chapping
blains. A little is well rubbed into
, previously washed clean and wiped
me persons add colour and scent; but
generally sold without either. The
able colours are amber, pink, or yellow.
t perfumes are *allspice*, *ambergris*,
loves, *musk*, *nutmeg*, *rondoletia*, *vanilla*,
tc. See ALMOND CAKES (*antè*).

Clothes. See SCOURING BALLS.

Contrayer'va. *Syn.* LA'PIS CONTRA-
, GLOB'ULI C., L. *Compound contra-*
owder made into balls with *gum-water*.
lete preparation, once in great repute
imulant, tonic, diaphoretic, and ab-
.

Cop'ying. These have a similar com-
to 'heel-balls' (see *below*). For BLACK,
t colouring matter is *lamp-black* or
o with about *half* its weight of *indigo*;
ONZE-COLOUR, *bronze-powder* is substi-
and for a mellow BROWN, burnt *terra*
na. These should be all in *very fine*
. The semi-fluid mass is poured into
t cylindrical moulds—paper pill-boxes
the purpose well.—*Used* by artists and
s to copy inscriptions, monumental
, and other slightly raised or sunken
s; the ball being rubbed *over the*
previously *laid flat on the design, and*
rely in its place. They are sometimes rendered more permanent by damping the *wrong* side with a sponge dipped in *water*, *strong spirit*, or *oil of turpentine*; or by passing the wrong side over a *hot iron* held with the face upwards.

Balls, Cosmet'ic. See SAVONETTES, &c. (also *above*).

Balls, Cream. See SAVONETTES, SOAP BALLS, &c.

Balls, Dog. See DOGS.

Balls, Gas'coign's. *Syn.* GLOB'ULI GASCOIG'NII, L. *Gascoign's powder* made up into small balls with thin mucilage. See POWDERS.

Balls, Heel. *Prep.* 1. (Ullathorne's.) *Bees' wax*, 1 *lb.*; *suet*, 4 *oz.*; melt together, and stir in of *ivory-black* (very finely powdered), 4 *oz.*; *lamp-black* (sifted, 3 *oz.*; *gum arabic* and *sugar-candy*, of each (in very fine powder), 2 *oz.*; and, when thoroughly mixed and partly cold, pour the composition into tin or leaden moulds.

2. To the last add of *resin*, 3 *oz.*; *oil of turpentine*, 2 *oz.*

3. *Hard suet* and *bees' wax*, of each, 4 *oz.*; *powdered gum*, *sugar candy*, and *Venice turpentine*, of each, 1 *oz.*; *ivory-black* and *lamp-black*, of each, 2 *oz.*; as before.

4. *Suet* and *bees' wax*, of each, 4 *oz.*; *lamp-black* and *brown sugar*, of each, 8 *oz.*; *common size*, 5 *oz.*; melt together and stir until incorporated.

Uses, &c. Employed to black leather, and more especially by shoemakers for the edges of the soles; the ball being first rubbed on, and the part afterwards smoothed over with a burnisher or polished iron tool gently heated. Also used by artists to copy inscriptions, basso relievos, &c. To produce a good article, the gum, colouring matter. and sugar, must be in the state of *extremely fine* powder, and the mixture very carefully made; no lumps being left. Some persons dissolve the gum in a little water, and then stir the mixture over the fire until it acquires the proper consistence for moulding (as in No. 4, *above*); but the first is accounted the best method.

Balls, Horse. See VETERINARY MEDICINE, &c.

Balls, Martial. *Syn.* GLOB'ULI MARTIA'LES, L. *Prep.* 1. Those of the P. Cod. consist of *tartarised iron* mixed with *aromatics*, and made up into small globular masses.

2. (BOULES DE NANCY.) Equal parts of *iron filings* and *red tartar*, in fine powder, made into balls with *proof spirit* or *brandy*. Both are *used* as chalybeate tonics, either in the form of pills or dissolved in hot water. Seldom employed in England.

Balls, Physic. (Vet. Med.) See MASSES.

Balls, Poultry. See POULTRY.

Balls, Scent. See PASTILS (Toilet), PERFUMERY, POMAMBRA, SCENTS, &c.

Balls, Scouring. *Syn.* BREECH'ES BALLS, CLOTHES B., CARPET B., &c. *Prep.* 1. *Curd soap* (*sliced*), 1 *lb.*; *water*, 2 *oz.*; melt in a water bath, or a glue-pot, and when cooled a little, add *ox-gall* and *oil of turpentine*, of each, 2½ *oz.;* mix well and roll or mould the mass into balls or cakes.

2. *Fuller's earth*, 2 *lbs.; curd-soap*, 1 *lb.;* beat to a stiff paste with *ox-gall*, q. s.

3. *Soft soap* and *fuller's earth*, equal parts, beat up with a little *oil of turpentine*, and either with or without a little *essence of lemons*.—*Obs.* The above are used to remove paint, grease, and dirt from cloth, carpets, &c. The spot, first moistened with hot water, is rubbed with the cake, and allowed to soak a few minutes, or to become nearly dry, when it is well rubbed with a little warm water and a brush or piece of woollen cloth, and afterwards rinsed in clean water, and finally rubbed dry and smoothed off with a piece of dry cloth or a dry brush. The *last* formula produces the composition so commonly vended about the streets of London in penny cakes.

4. *Whiting* and *pipe-clay*, equal parts; *water*, q. s. *Used* for soldiers' belts, trousers, &c.

5. *Pipe-clay*, 2 *lbs.; fuller's earth*, 1 *lb.; whiting*, ¼ *lb.; water*, q. s.

6. *Bath brick*, 1 *lb.; pipe-clay*, 2 *lbs.; soft soap*, ¼ *lb.; ox-gall*, ½ pint.

7. To the last add of *pumice-stone*, in very fine powder, 6 *oz.*—*Obs.* The last four are used for cloth and leather, especially for drab and light-coloured coats, trousers, leather breeches, belts, and gloves. *Rose pink*, *yellow ochre*, *umber*, *Irish slate*, or other like colouring matter, may be added to produce any desired tint. *White pepper*, *cloves*, &c., are also occasionally added to drive away moths and insects; and *orris root*, or *essence of bergamot* or of *lemon grass*, as perfume.

Balls, Sweet. See SCENT BALLS (*antè*).

Balls, Tan. The *muddy sediment of tan-pits* made into balls or lumps.—*Used* by the poor for summer fuel.

Balls, Wash. See SAVONETTES, SOAP, &c.

BALM (bahm). *Syn.* BAL'SAMUM, L.; BAUME, Fr.; BALSAM, Ger. Primarily, balsam (of which it is a contraction); formerly and still popularly applied to anything assumed to be soothing, healing, or genial in its action, particularly if also aromatic or fragrant; but chiefly to *medicines* and *liqueurs*, supposed to possess these properties. See BALSAMS, LIQUEURS, QUACK MEDICINES, &c.

Balm. *Syn.* COM'MON BALM, GAR'DEN B.; MELIS'SA, L.; BAUME, MÉLISSE, Fr. The *melis'sa officina'lis* (Linn.), an aromatic perennial herb, a native of the south of Europe, but commonly cultivated in our gardens. It is reputed to be diaphoretic, diuretic, emmenagogue, exhilarating, nervine, and stomachic; and under the form of infusion (BALM-TEA) has long been a popular remedy in hypochondriacal, hysterical, and nervous affections, and in amenorrhœa and chlorosis. It is still sometimes ordered as a drink in fevers and in hypochondriasis.

BAL'SAM (bawl'-săm; -sŭm‡§—Kn Walker). [Eng., Ger.] *Syn.* BAL' (băl'-), L.; BAUME, Fr. *Originally,* strong-scented oleo-resinous vegetable exudation, of about the fluidity of trea supposed to possess medicinal virtu *modern chemistry* and *pharmacy*, any ve production which is either semi-liq which naturally becomes concrete, and contains either benzoic acid, or cinnami combined with resin and aromatic esse Several of the substances popularly balsams contain no benzoic acid, and are sequently now classed with the *turp* This distinction, however, is far from universally adopted, and a late high aut defines balsams to be "Exudations from p which are liquid or soft solid, and consist substance resembling a resin, either com with benzoic acid, or with an essential o both." (Brande.)

The leading properties of the true na balsams are—Insolubility in water, al entire solubility in alcohol, and partial bility in ether and in the volatile and oils; the possession of a powerful, and g ally, an agreeable odour, a hot, resino terebinthinate taste, and the usual stim and tonic properties of the milder turpen Distilled with water, ethereal oil and acid pass over, and the residuum consists c or entirely of acid-resin.

The TRUE BALSAMS, as those of *be Peru*, *styrax*, and *tolu*, and the celeb *Chinese varnish-balsam*, contain either be or cinnamic acid. Among those falsely te *balsams*, are copaiba, opobalsam, Japan varnish, and some of the turpentines.

The following list includes most of the stances, natural and artificial, which pa have passed, under the name of balsams:[1]

Balsam, Acous'tic. See DROPS.

Balsam, Amer'ican†. Balsam of Peru.

Balsam, An'odyne. *Syn.* SOOTH'ING SAM; BAL'SAMUM ANO'DYNUM (-dĭn-) TRANQUIL'LANS, L.; BAUME ANODIN, B. T QUILLE, B. TRANQUILLISANT, &c., Fr. *Pr* (Bate's.) See PATENT MEDICINES.

2. (Guy's.) A vulnerary balsam inve by Guy, of Caliac, once in great repute now obsolete. It consisted of *aloes*, *a ammoniacum*, *balsam of Peru*, *bdellium ranna*, *castor*, *galbanum*, *labdanum*, *olibanum*, *storax*, *tacamahaca*, and *Venice pentine*, digested in *alcohol*.

3. (B. TRANQUILLANS, P. Cod.) *Fresh l* of *belladonna*, *henbane*, *black nightshade bacco*, *poppies*, and *stramonium*, of (bruised), 4 oz.; *olive oil*, 6 pints; heat together until all the moisture is evapor leave them to digest for 2 hours, and strain with pressure; next pour the 'hot on *dried* '*tops*' of *wormwood*, *hyssop*, *lave*

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[1] For articles and preparations often called 'bal and not found under this head, see ELIXIRS, OILS, PA MEDICINES, PERFUMERY, TINCTURES, &c. &c.

costmary, round-leaved mint, rue, St. John's wort, and the dried elder and rosemary, of each, 1 oz.; r a month, press, strain, and pre- l in a cool dark place.[1]

ES TRANQUILLES DE CHOMEL.) Hen- d's tongue, and tobacco, of each, te wine, 3 pints; boil down to a ne, strain, and add to the hot liquor' of olive oil, 1 quart, and

Ap'oplexy. *Syn.* BAL'SAMUM APO- t, B. AD APOPLEC'TICOS (Ph. E. Prep. 1. *Amber, civet, musk, Pe- ru,* and some *volatile oils,* made m.

l. 1744.) *Expressed oil of nutmeg,* fy by a gentle heat, and stir in of ' *cloves, lavender,* and *rosemary,* of : *oil of amber,* 10 drops; *balsam of* r. Both were formerly *used* to head and nostrils of apoplectic d were believed to be of great

alest'ist†. Balm of Gilead.

ate's. See BALSAM, ANODYNE.

razil'ian. Balsam of copaiba.

alaba'. *Syn.* TACAMAHA'CA. A inous substance produced by *calo- aba,* or Santa Maria tree.

am'phor. *Syn.* CAM'PHORATED AL'SAMUM CAMPHORA'TUM, &c., L. s *camphor-liniment,* Ph. L.

I'TICUM C., Sanchez's GOUT-B.:— *Curd-soap* and *camphor,* of each, f *thyme,* 2 scru.; *acetic ether,* 5 oz.; ther in a stoppered bottle until the dissolved. Recommended as an nodyne liniment in certain forms sm and gout.

ana'da. See TURPENTINES.

Cana'ry. A volatile oleaginous btained by distillation from *draco- Moldav'icum.*

arpa'thian. Riga Balsam.

ephal'ic (Saxon). *Syn.* BAL'SA- AL'ICUM SAXON'ICUM, L. A liquid obtained from the *essential oils of ander, marjoram, nutmeg, penny- sage, &c.,* distilled together. Once ute; but long disused in England.

hil'blain. See LINIMENTS.

Chi'na Varnish. The aromatic s exudation of *au'gia sinen'sis,* used inese as a varnish or lacquer, for pose it is, perhaps, unequalled. It fragrant, and abounds in benzoic

ommand'er's†. Compound tincture

Copalm'. Liquid-ambar.

Egyp'tian†. Balm of Mecca.

Fe'male. *Syn.* BAL'SAMUM EMBRYO'- s E., L. An obsolete preparation

of the absurd complexity of French for-

made by digesting *misletoe, civet, musk,* and several other *aromatics,* in a *mixture of wine* and various *medicated waters,* and submitting the whole to distillation. Formerly taken both internally and externally, as a tonic for both fœtus and mother; and particularly to prevent abortion, &c.

Balsam, Fri'ar's. Compound tincture of benzoin.

Balsam, Gen'oa. Locatelle's balsam.

Balsam, Glyc'erin (glis'-). *Syn.* BAL'SAMUM GLYCERI'NÆ, L. *Prep.* To *white wax* and *spermaceti,* of each, 1 *oz.; almond oil,* ½ *lb.;* melted together, add of *glycerin,* 2 *oz.; balsam of Peru,* ½ *oz.;* and stir or agitate until nearly cold. 12 or 15 drops of *otto of roses* may be substituted for the balsam.—*Used* to soften and whiten the skin, and to prevent chaps and chilblains.

Balsam, God'bold's Vegetable. See PATENT MEDICINES.

Balsam, Goulard's'. *Syn.* BAL'SAMUM GOULAR'DII, B. SATUR'NI, L.; BAUME DE GOULARD, Fr. *Prep.* (Van Mons.) *Acetate of lead* (in fine powder, and quite dry) is triturated, for some time, with *hot oil of turpentine,* in a heated mortar, or until no more will dissolve; after repose, and whilst still hot, the clear portion is decanted. Recommended as a useful application to foul and painful ulcers, and to scalds and burns.

Balsam, Green. *Syn.* BAL'SAMUM VIR'IDE, &c., L.; BAUME VERT, Fr. *Prep.* 1. *Linseed-oil,* 6 lbs.; *gum-elemi,* 1 lb.; heat them together; add of *powdered verdigris,* 3 oz., or *q. s.* to impart a rich green colour, and, after repose, decant the clear portion.

2. *Linseed oil* strongly coloured with *verdigris.* Both were formerly much used by surgeons as detergents. 'Green-oil' or 'oil of elder-leaves' is now commonly sold for it.

A natural balsam, brought from Peru, and produced by *chlorox'ylon verticilla'tum,* is also popularly called GREEN BALSAM (of Peru).

Balsam, Gurgun' (-gōōn'). *Syn.* GURGI'NA BALSAM, WOOD-OIL (of India). From *dipterocar'pus triner'vis,* and other species, by applying a slow fire to a notch or wound made in the trunk. Has a mixed smell of copaiba and naphtha. *Properties* and *dose* similar to those of balsam of copaiba. Sp. gr. ·962 to ·964. See COPAIBA and WOOD-OIL.

Balsam, Hill's, of Honey. See PATENT MEDICINES.

Balsam, Hunga''rian. *Syn.* BAL'SAMUM HUNGAR'ICUM, L. A terebinthinate exudation from the extremities of the branches of *pi'nus pumil'io* (Willd.) or *mountain-pine.* It is also obtained by pressure from the 'cones' of the same tree.

Balsam, Io'duretted. See LINIMENTS.

Balsam, Japan' Varnish. *Syn.* JAPAN LACQ'UER. *Exudes from incisions made in the trunk of melanorrhæ'a usitatis'sima,* according to Wallich; or *stagma''ria vernicif'lua,* according to Lindley. It constitutes the celebrated lac-varnish of the Japanese. It differs from that of China, and from the true balsams, in not containing benzoic acid. It is extremely acrid and irritant; and even its fumes affect the eyes and respiration.

Balsam†, Jews'. Balm of Gilead.

Balsam, Locatelle's'. *Syn.* LOCATEL'LI'S BALSAM; BAL'SAMUM LOCATEL'LI, B. LUCATEL'LI, B. ITAL'ICUM, B. GENOFE'VÆ, &c., L. var. *Prep.* 1. (Original Formula.) *Olive oil,* 6 oz.; *yellow wax,* 4 oz.; *sherry wine,* 5 fl. oz.; *red sanders* (in very fine powder), 4 dr.; simmer them together until the moisture is nearly evaporated, then add of *Strasburgh turpentine,* 6 oz.; *balsam of Peru,* 2 drs.; strain through linen, and stir until nearly cold.

2. (Ph. E. 1744.) *Olive oil,* 24 fl. oz.; *yellow wax,* 1 lb.; melt, and add of *Venice turpentine,* 1½ lb.; and, when cooled a little, further add, *powdered dragon's blood,* 1 oz.; *balsam of Peru,* 2 oz.; and stir until cold.

3. (Ph. L. 1746.) *Olive oil,* 16 fl. oz.; *Venice turpentine* and *yellow wax,* of each, ½ lb.; *red sanders,* 6 drs.

Uses, &c. A once highly esteemed pectoral, and still occasionally used, by the lower classes, in phthisis and chronic coughs (mixed with an equal weight of *conserve of roses*), and as a mild stimulating ointment.—*Dose.* ½ dr., or more.

Balsam, Mercu"rial†. Ointment of nitrate of mercury.

Balsam, Metz's. *Syn.* BAL'SAMUM VIR'IDE METEN'SIUM, L.; BAUME VERT DE METZ, Fr. *Prep.* (Guibourt.) *Linseed oil* and *olive oil,* of each, 6 oz.; *oil of laurel-berries,* 1 oz.; *common turpentine,* 2 oz.; melt by a gentle heat, and add of *verdigris,* 3 drs.; *aloes,* 2 drs.; *sulphate of zinc,* 1½ dr.; (all in powder;) mix well, strain or pour the liquid into a bottle, and add *oil of juniper,* 4 drs.; *oil of cloves,* 1 dr.—*Used* on the Continent as a common detergent dressing to wounds and ulcers.

Balsam, Mex'ican†. Balsam of Peru.

Balsam, Nat'ural†. That which exudes from plants, as opposed to those formed by art.

Balsam, Nerv'ine. See OINTMENTS.

Balsam, Odontal'gic. See DROPS.

Balsam, Opodel'doc. See OPODELDOC (French).

Balsam, Pec'toral. *Syn.* BAL'SAMUM PECTORA'LE, L.; BAUME PECTORAL, Fr. *Prep.* 1. *Tincture of tolu* and *compound tincture of benzoin,* of each, 2 oz.; *rectified spirit,* 4 oz.; mix.—*Dose.* ½ to 1 teaspoonful, night and morning; in chronic coughs, hoarseness, &c.

2, 3. See BALSAM OF HONEY, B. OF HOREHOUND, &c.

Balsam, Per'sian†. Friar's Balsam.

Balsam, Peru"vian. See BALSAM OF PERU (*below*).

Balsam, Pol'ychrest. See DROPS & ELIXIRS.

***Balsam, Ri'ga** (rē'-).* *Syn.* CARPA'THIAN BALSAM; BAL'SAMUM CARPATH'
LIB'ANI, &c., L.; BAUME DE CARP
A pellucid white fluid obtained
distillation from the young shoot
cem'bra (Linn.) or *Siberian ston*
much resembles oil of juniper; and,
article, is powerfully diuretic. It i
as vulnerary, and is highly esteem
in sprains and bruises. The bottom
juniper are commonly sold for it in
The *spirit* distilled from *pine-top*
turionum pini) is also frequently, al
correctly, called RIGA BALSAM.

Balsam, Sanchez's Gout. See CAM
BALSAM (*above*).

Balsam, Sooth'ing. See ANODYN

Balsam, Stomach'ic. (-măk'-).
SAMUM STOMACH'ICUM, L.; BA
MACHIQUE, Fr. *Prep.* (Ph. Slesv.-
Oils of cloves, mace, wormwood, a
mint, of each, 1 dr.; *balsam of P*
oil of nutmeg, 2 oz.; mix. 1 to 5
on sugar, or dissolved in spirit.

Balsam, Syr'ian. Balsam of Mec

Balsam, Thibaut's. See PATE
CINES.

Balsam, Tooth'ache. See DROPS,

Balsam, Traumat'ic. Compound
benzoin.

Balsam, Tur'key. *Syn.* TUR'K
The distilled oil of the *dracocephal*
vicum.

Balsam, Tur'lington's. See PAT
CINES.

Balsam Univer'sal. *Syn.* BAL'S
VERSA'LE, L. *Prep.* (Ph. Slesv.-
Rape oil (recent), 1½ lb.; *yellow*
acetate of lead (in fine powder), 3
dered camphor, ½ oz.; melted to
serving to triturate the 'acetate' w
portion of the 'oil' before addin
mixture, and not to add the 'cam
the heat is reduced a little.—*Obs.*
has also been given to 'compoun
lead,' and even to 'cerate of
lead.'

Balsam, Ver'vain's†. Compound
benzoin.

Balsam, Wound. Several vulne
rations have been so called; but F
SAM ('comp. tinct. of benzoin') is t
intended.

Balsam of Acou'chi. A yellowi
liquid, of a terebinthinous nature
ence, obtained from the wounded b
shoots of the *icica heterophyl'la* (
highly esteemed as vulnerary by t
Guiana. (Lindley.)

Balsam of Alpi'nus. Balm of
cause Prosper Alpinus wrote a
treatise on it.

Balsam of Am'ber. *Syn.* BAL'S
CINI, L.; BAUME D'AMBRE, Fr.
to which this term is usually appli
already noticed. *Oil of amber* w
merly so called; and the same

m to the following and other like
ies by their inventors :—
dim.) *Oil of amber*, 4 fl. oz.; *oil of*
l fl. oz.; *oil of turpentine*, 1 fl. oz.;
a gentle heat.
ls.) See Patent Medicines. They
iment and antispasmodic, and are
r internally or as a friction, like oil

of Arcæ'us. *Syn.* Bal'samum Ar-
Baume d'Arcæus, Fr. A digestive
formerly in great repute, and still
ployed on the Continent. It is now
d in England by the *comp. elemi*
of the Pharmacopœias. In the ori-
mula, *boiling water*, 4 parts, were
o be stirred in.
of Can'ada. See Turpentines.
of Cloves. *Syn.* Aromat'ic balsam
m; Bal'samum caryophyl'li, L.
ries.) *Oil of cloves* and *oil of nutmeg*,
dr.; *spirit of juniper berries*, 3 oz.;
befacient and diuretic.—*Used* chiefly
lating friction. *Internally*, ½ to 1
d.
of Copai'ba. See Copaiba.
of Fern. Oil of male fern.
of Fioraven'ti. *Syn.* Bal'samum
r'ti, L. *Prep.* (P. Cod.) *Venice tur-*
3 oz.; *amber, elemi, galbanum, myrrh*,
d *tacamahaca*, of each, 3 oz.; *aloes*,
y-*berries*, 4 oz.; *cinnamon, cloves*,
ginger, nutmegs, and *zedoary*, of each,
ttany of Crete, 1 oz.; *rectified spirit*,
macerate a week and distil off 7 lbs.
led spirit constitutes this notable
m of, professedly, many virtues. It
l aromatic, diuretic, antispasmodic,
lant. One of its applications is as a
—a drop or two being rubbed on the
the hands, which are then held to
so as to cover, without touching
chronic ophthalmia, conjunctivitis,

of Gil'ead. See Balsam of Mecca.
of Gua'iacum (gwā'-yă-). *Syn.* Bal'-
sai'aci, B. guaiaci'num, L. *Prep.*
745.) *Gum-guaiacum*, 1 lb.; *balsam*
3 drs.; *rectified spirit*, 1 quart; digest
and filter. Diaphoretic, arthrodynic,
yna.—*Dose.* 30 to 60 drops, in milk
; in agues, rheumatism, &c. *Exter-*
puted also antisuppurative.
of Hon'ey. (hŭn'e). *Syn.* Pec'to-
sam, P. b. of honey; Bal'samum
B. pectora'le, B. p. mellis, L.;
de miel, &c., Fr. *Prep.* 1. *Bal-*
lu, 1 lb.; *honey* (finest), 2½ lbs.; *rec-*
rit, 1 gal.; *turmeric*, 1 oz.; make a

before maceration, add of

nt Medicines.
d in colds, tickling
&c., *when unac-*
[illegible]

companied with fever.—*Dose.* For an adult, ½ to 1 teaspoonful, twice or thrice a day; an occasional dose of some mild aperient being also taken. Tincture of balsam of tolu, or a mixture of the tinctures of tolu and benzoin, is frequently sold in the shops under the name of '*balsam of honey*.' See Pectoral Balsam, &c.

Balsam of Hore'hound. *Syn.* Bal'samum marru'bii, L. *Prep.* 1. *Extracts of horehound* and *liquorice*, of each, 2 oz.; *hot water*, ½ pint; dissolve, and when cold, add of *paregoric*, ¾ pint; *oxymel of squills*, 6 oz.; *tincture of benzoin*, 2 oz.; *honey*, 10 oz.; and, after thorough admixture, strain through flannel.

2. (Ford's.) See Patent Medicines.

Uses, &c. A popular pectoral.—*Dose, &c.*, same as of balsam of honey (*above*).

Balsam of Houmi''ri. [Nat.] From *humir'ia balsamif'era*, or the *houmiri-tree* of Guiana. It resembles '*balsam of umiri*' produced by another tree of the same genus. (See *below*.)

Balsam of Lead. See Goulard's Balsam.

Balsam of Life. *Syn.* Balm of life; Bal'samum vi'tæ, L.; Baume de vie, Elix'ir de vie, &c., Fr. Several compound medicines have been called by this name. Those of Gabius, Hoffman, and Turlington, are noticed under Patent Medicines (which *see*). The following are distinct preparations:—

1. Baume de vie externe:—*Soap-liniment*, 2 parts; *oil of turpentine*, 1 part; mix. Stimulant and rubefacient. *Used* as a friction.

2. Baume de vie purgatif; Elixir de vie:—*a.* (Briett.) *Socotrine aloes* and *saffron*, of each, 2 drs.; *rhubarb*, 6 drs.; *liquorice-root*, 1 oz.; *proof spirit* or *brandy*, ½ pint; digest a week, and filter.

b. (Original Swedish formula.) *Aloes*, 9 drs.; *agaric, gentian, rhubarb, saffron, theriaca*, and *zedoary*, of each, 1 dr.; *proof spirit* or *brandy*, 1 quart. A mild stomachic purge.—*Dose.* 1 to 6 drs. *Tincture of rhubarb-and-aloes* (Ph. E.) is commonly substituted for it. See Elixirs.

Balsam of Liq'uorice. See Patent Medicines.

Balsam of Mec'ca. *Syn.* Balm of Gil'ead, B. of Mec'ca, Opobal'sam (-bawl'-), Jews' balsam†, Oil of b.†, &c., Eng.; Bal'samum (băl'-) gileaden'se, B. è Mec'ca, Opobal'samum (-băl'-), &c., L.; Baume de la Mecque, B. de Mecca*, B. de Judée, Opobalsamum, &c., Fr.; Bal'samum Ægypti'acum†, B. Alpi'ni†, B. antiquo''rum genui'num†, B. Asiat'icum†, B. Syri'acum†, O'leum bal'-sami†, &c., L. A fragrant oleo-resinous substance, obtained from *balsamoden'dron gileaden'se* (Kunth.; *am'yris gileaden'sis*, Linn.; *a. opobal'samum*, Forsk), a middle-sized tree of the *nat. ord.* Terebinthaceæ (DC.), growing in Arabia Felix, Asia Minor, and Egypt. It is *the* balm *of the Old Testament*, and the *βάλσαμον of Theophrastus* and Dioscorid

It is chemically classed with the turpentines.

Prop., *&c.* When fresh it is turbid and whitish, but becomes by degrees transparent, of a rich golden colour, and slightly thicker; and by exposure, eventually solid. It possesses a penetrating and delicate fragrance; tastes sharp, bitter, spicy, and somewhat astringent; is not entirely soluble in rectified spirit, but dissolves more or less completely in both the fixed and volatile oils, which then assume the fragrance of the balsam. A drop let fall on hot water, spreads itself over the whole surface, like a film of oil, and again contracts on the water cooling. This, with its fragrance, is the common test of its genuineness in Turkey. The inferior qualities, or those of commerce, are generally opaque and thick, rapidly resinifying and turning of a dull yellow by age. When applied to the skin it causes redness and swelling. It was formerly regarded as possessing the most varied and exalted virtues, particularly as an antiseptic, stimulant, vulnerary, and nervine; and its fumes were supposed to prevent barrenness. It is still highly prized in the East as a cosmetic and perfume; and is said to be unequalled for giving a healthy glow to the complexion and promoting the growth of the hair. Its medicinal qualities are intermediate to those of the aromatic turpentines and balsam of tolu.—*Dose.* From 3 to 6, or even 10 or 12 drops.

Obs. According to Bruce, and others, the best *balm of Gilead* is a spontaneous exudation from the tree; a second quality is obtained by cutting the bark with an axe, and receiving the juice which exudes in a small earthen bottle. A large branch is said to produce not more than 3 or 4 drops a day; and even the most resinous trees seldom yield more than 60 drops daily. Hence its scarcity and costliness. Both varieties are held in such high estimation by the Turks and Egyptians, that none of them are exported as an article of commerce. That which is sent to England is obtained by boiling the leaves and young twigs of the *balsam tree* in water, and is rejected by the Orientals as worthless. Most of that sold in the shops of England is entirely spurious (see *below*).

The *cosmetics* recently so much advertised as 'BALM OF MECCA,' do not contain even a trace of this article; nor do we believe that there is a single drop of the genuine balm to be purchased in London.

The following formulæ are current in the trade for **Fac''titious Balm of Mecca**:—

1. *Gum-benzoin* (bright, coarsely powdered), 4 *oz.*; *liquid styrax* (finest), 3 *oz.*; *balsam of tolu*, 2 *oz.*; *Canadian balsam*, 1½ pint; are mixed together in a flask, and exposed (closed) to the heat of a water bath, with frequent agitation, until the liquid is saturated; when cold, the clear portion is decanted, and a *sufficient quantity of the oils of lemon*, *cassia*, *rosemary*, *nutmeg*, and *vanilla*, added t
a strong aromatic odour.

2. From *gum-benzoin* and *balsam*
of each, 1 *oz.*; *vanilla* and *nutmeg*,
(cut small), 1 *dr.*; *Canadian balsam*,
digested as before, and some *essential*
to the decanted liquid.

Balsam of Nut'meg. *Syn.* BAL'SA
RIS'TICÆ, B. NUCIS'TÆ, L. *Prep.* (
1847.) *Expressed oil of nutmeg* (—
3 *oz.*; *olive oil*, 1 *oz.*; *yellow wax*, ½
them together by a gentle heat,
mixture into paper moulds, and, w
cut the mass up into cakes.

Balsam of Peru' (-rōō'). *Syn.* P
BALSAM; BAL'SAMUM PERUVIA'NUM
E., and D.), L.; BAUME DU PÉROU,
VIEN, Fr.; PERUVIANISCHER BALS
A balsam obtained from *Myroxylon*
(*Myrospermum* of Sonsonate). It exu
the trunk of the tree after it has been
and removed. From Salvador, in
America. B. P.

Prop., *&c.* A chocolate-coloured or
brown liquid, of the consistence of
possessing a bitterish, rather punge
and an agreeable aromatic odour
similar to that of a mixture of va
benzoin. It is reputed stimulant, t
expectorant, and has long been a po
medy in chronic asthma, catarrh, a
pulmonary affections, debility, &c.
however, principally used as an ingr
pommades, hair-oils, lip-salves, and o
metics, in which it is only inferior to
Mecca;' and in compound perfumer
also used to scent lozenges, pastils,
colate and liqueurs; for these last, ch
substitute for 'vanilla' when it is sc
dear.—*Dose.* 10 or 12 to 30 grs. (eve
sometimes given), either on sugar,
into a bolus with liquorice powder,
an emulsion with honey, mucilage, o
egg.

Pur., *Tests*, *&c.*—1. The sp. gr. s
be *lower* than 1·15; nor *higher* than
2. Ether *dissolves* it *readily* and *com*
3. Soluble in 5 parts of rectified
4. It should undergo *no diminution* i
when agitated with water:—5. 100
its benzoic or cinnamic acid, sho
rate not *less* than 7½ grs. of pure cr
carbonate of soda:—6. Sulphuric
verts it into *resin*, *artificial tannin*,
coal, according to the quantity empl
on adding water, a *brittle* resin is not
some fixed oil (probably *castor oil*) is
—7. Treated with nitric acid, som
cyanic acid is formed, *benzoic acid*
and the residual matter is *artificial t*
8. The alkalies and their carbona
with it a *thickish semi-crystalline mas*
on being treated with sulphuric acid,
a peculiar resinous matter, with cr
benzoic and cinnamic acid:—9. If a
are distilled, and, when iodine is add

an *explosion* results, it has been adul-
with 'copaiba';—10. The genuine
ntains about 6½ % of *benzoic* (cin-
id.
balsam of Peru was formerly very
adulterated, and often entirely fac-
but, owing to its present reduced
is now only confined to a few of the
incipled venders. The following
for this purpose are still extant in
:—
of Peru, Facti"tious:—From *gum-*
a coarse powder), 3 *lbs.*; dissolved in
possible quantity of *rectified spirit*,
mixed with *balsam of tolu*, 1 *lb.*;
styrax, 2 *oz.*; subsequently adding
spirit, q. s.
Reduced Peruvian:—1. *Balsam of*
lb.; *balsam of tolu*, 2 *lbs.*; *rectified*
to reduce it to a proper consist-
Balsam of Peru, 3 *lbs.*; *gum-benzoin*
in a little rectified spirit), 1 *lb.*; as

of Rackasi'ri. *Syn.* BALSAM OF
A; BAL'SAMUM RACKASIRI, B. RACAS-
RHADASI'RI. A species of balsamic
, said to be obtained from the *bur-*
nifera (Pers.), an Indian tree of
al order Terebinthaceæ. It has a
tter taste, adheres to the teeth when
d, when heated, smells like balsam
It has been extolled as possessing the
copaiba in an exalted degree. The
ded under the name of BALM OF
by certain quacks, simply consists
gin, coloured, sweetened, and aro-

of Saffron. See ELIXIRS.
of Soap. Soap-liniment.
of Soap (Ethe"real). *Syn.* BAL'SA-
NIS ÆTHE"REUM, L. *Prep.* (Cotte-
stile soap (powdered) and *camphor*,
dr.; *oil of thyme*, 10 drops; *acetic*
.; dissolve in a close vessel with the
gentle heat, and decant the clear
Used as an embrocation or liniment
umatism, &c.
of St. John's Wort. See OILS.
of Sto"rax. Liquid-ambar or styrax.
of Sul'phur. See OILS.
of Syri'acum. See BALSAM OF MECCA
NT MEDICINES.
of Tolu' (-lōō'). *Syn.* TOLU' BAL'-
L'SAMUM TOLUTA'NUM (Ph. L., E.,
E TO'LŪ, L.; BAUME DE TOLU, Fr.;
ISCHER BALSAM, B. VON TOLU, &c.,
sam flowing from the incised trunk
per'mum toluif'erum." (B. P.) The
h produces it is a native of the
of Tolu, Turbaco, &c., in South

Then first brought over
w age and careless
es brittle, some-
perfectly *soluble*
ows out its acid

(benzoic or cinnamic) to water. Its odour is fragrant, though less powerful than that of either styrax or balsam of Peru; and it has a pleasant sweetish taste. It softens under the teeth, melts readily, and burns with an agreeable odour. As a *medicine*, it is a stimulating expectorant, and, as such, is employed in chronic bronchial affections unaccompanied with inflammatory action. It has long been a popular pectoral. *Syrup of Tolu* is an agreeable and common adjunct to pectoral mixtures, and, with *Tolu lozenges*, is often serviceable in tickling coughs. It is also used by confectioners, perfumers, &c., and in fumigating pastils.—*Dose*, 5 to 20, or even 30 grs., dissolved in spirit, or made into an emulsion.

Pur. This is shown by its perfect solubility in rectified spirit, forming a transparent tincture, and by its odour. When adulterated it has a weaker smell, is only partially soluble in alcohol, and the *tincture* formed with that fluid is opaque. The presence of colophony (or lac), according to Ulex, may be detected by the balsam, instead of dissolving in sulphuric acid, swelling up, blackening, and disengaging sulphurous fumes.[1] Castor oil may be detected in the way noticed under BALSAM OF PERU.

Balsam of Tolu, a Factitious, was formerly met with in trade, made of equal parts of *orange-lac* and *white sugar*, reduced to a proper consistence with *rectified spirit*, and 'brought up' with some *tincture of benzoin*, and a few drops of the *oils of cassia* and *nutmeg* dissolved in a little *essence of vanilla*.

Balsam of Tur'pentine (-tīne). *Syn.* BAL'SAMUM TEREBIN'THINÆ, L. A name formerly given to Strasburgh, Venice, and other like turpentines.

Balsam of Tur'pentine (Emollient). *Syn.* B. TEREBINTHINA'TUM, L. *Prep.* *Olive oil*, 6 oz.; *oil of turpentine*, 2 oz.; *yellow wax*, 1 oz.; *balsam of Peru*, *oil of nutmeg*, and *camphor*, of each, 2 drs. A stimulant emollient; in contusions, ulcerations, engorgements, nephritic pains, &c.

Balsam of Umi"ri. [Nat.] By incision, from the *humir'ia floribun'dum* (Mart.), or the *umiri-plant* of Para. It is fragrant, limpid, of a palish-yellow colour, and in its medicinal properties is said to combine those of the balsams of copaiba and Peru.

BALSAM'IC (băl-). *Syn.* BALSAM'ICUS, BALSA'MEUS, BALSAM'INUS, L.; BALSAMIQUE, Fr.; BALSAMISCH, Ger. Of the nature of balsam, or containing or resembling it; bland, soothing, healing; balmy.

BAMBOO' (-bōō'). [Nat.] *Syn.* BAMBU'SA, L.; BAMBON, Fr.; BAMBUS, BAMBUSROHR, INDIANISCHER ROHR, Ger. The name of several species of the genus 'bambusa,' but appr. of *b. arundina'cea* or 'common bamboo.' See BAMBUSA (*below*).

Bamboo'-habit (-hăb-). A species of 'life-preserver,' or 'float,' used in China and the

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[1] "*Archiv der Pharm.*," 1856.

Indian Archipelago, consisting of four pieces of bamboo tied together so as to form a square.

BAMBU'SA. [Endl.] The bamboo. In *botany*, a genus of magnificent arborescent grasses, of the *nat. ord.* Gramineæ (DC.), having hollow jointed stems, of a hard woody texture, externally coated with siliceous matter, and sometimes secreting a similar siliceous substance (TABASHEER') in their internal cavities. They are all of rapid growth, and vary in height from 6 to 150 feet.

There, is, perhaps, scarcely any other plant, besides the palm, which serves for so many purposes useful to man, as the various species of bamboo. Its grain is used for bread; the young shoots are eaten like asparagus, and are also pickled; the smaller stalks are made into walking canes, umbrella and parasol sticks, flutes, &c.; whilst its fibres are manufactured into cloth, and even paper. It is employed extensively in the construction of *houses, bridges, masts for boats, domestic furniture, boxes, mats, baskets, utensils of various kinds, fences, water pipes* and *vessels, quicksilver bottles*, &c., and for numerous other purposes connected with everyday life. The genus is confined to the East and West Indies and tropical America.. See CANE, PICKLES, TABASHEER, &c.

BANA'NA (-nā'- *or* -nah'-). [Nat.] The *mu'sa sapien'tum* (Linn.), a species of plantain; also its fruit. See PLANTAIN.

BAND'AGE (-āje). *Syn.* DELIGA'TIO, FAS''CIA, LIGA'MEN, LIGATU''RA, VINCTU''RA, L.; BANDAGE, BANDE, Fr.; BINDE, VERBAND, Ger. In *surgery*, the fillet, roller, or cloths, used to support parts, to exert pressure on them, or to retain dressings in their proper places.

Bandages are usually formed of long narrow slips of calico or linen, and, occasionally, of flannel, which are generally made into a roll (ROLLER) of moderate size, so as to be the more conveniently handled and applied. They are either SIMPLE, as the *cir'cular*, the *spīral*, or the *unīt'ing bandage*; or COMPOUND, as the T-*bandage*, *suspen'sory b.*, &c.

The application of bandages, as in the dressing of wounds, ulcers, &c., though of such frequent occurrence, is often very carelessly and badly done. The form and nature of the part, and the object in view, should always receive consideration; as should also the condition of the patient after their application—whether of repose, exercise, or labour. Ordinary ingenuity will supply the rest. The safest, simplest, and most effective means of fastening them, is, in most cases, furnished by a common needle and thread or cotton.

Bandage, Mus'tard. A woollen roller soaked in a mixture of the best flower of mustard and warm water, of the consistence of fresh cream, the excess of moisture being expelled by gentle pressure.—*Used* to envelope the body, or a limb, by repeatedly folding it round the part; in the cold stages of cholera, and in other *cases requiring an energetic stimulant.* Other
medicaments, particularly those of a
ting and anodyne character, are
applied in the same manner. See
TIONS, LOTIONS, POULTICES, &c.

BANDAN'A. [Ind.] *Syn.* BAND
handkerchief, originally from the
having white spots on a red, blue,
dark ground. In *calico-printing*, a '
style' in imitation of the Indian
The fabric, many folds thick, is place
leaden plates having the pattern
them; hydraulic pressure is then ap
a clear solution of chloride of lin
through, followed by a stream of pu

BAND'OLINE (-ĭn; -lēne‡). S
TURE.

BANE. Poison; anything dele
destructive; a word often found
another, in the popular and vulgar
plants and diseases, to denote their
as BANE'-BERRY, the herb *Christoph*
WORT, *deadly-nightshade*; SHEEP'S
rot; &c.

BANG, Bangue (băng'). [Nat.] S
HEMP.

BAN'IAN (băn'-yăn). The *fi'cu*
(Linn.), or *Indian fig.* The fruit a
branches yield one species of gum
both the juice and bark are used me

Among sailors, BANIAN' DAYS are
which butcher's meat is not serv
dinner.

BANN'OCK (-ŭk). In *Scotland*
northern counties of England, a
cake made of *oat, rye*, or *barley m*
on an iron plate over the fire, or
hearth.

BAR (Management). See COU
TAIL, &c.

BAR'BERRY. *Syn.* PEP'PERID
THORNY BOX-'TREE*; BER'BERIS, B
RIS (Linn.), L.; EPINE-VINETTE, V
Fr.; BERBERITZE, Ger. A perenni
shrub common in woods and hedges
(BAR'BERRIES, PEP'PERIDGES), grat
cooling, and astringent; *used* in p
require, according to their degree o
from one half their weight to an eq
of sugar. Both *bark* and *berries*
merly esteemed in jaundice, biliary
The *crushed berries* with *water*
freshing fever-drink. The *root* dyes
yellow. See BERBERINE, JAMS, P
&c.

BAREGE (*barège*, băr-rāzhe').
light woollen fabric so named fro
been first made in the valley of
Of late years Paris has become cele
its barèges; but these are genera
with the 'warp' of silk, and the
wool. In the common imitation
shops, the 'warp' is generally of co

BAREGINE (barégine). See GLA

BARIL'LA. [Eng., Ger., L., S
SO'DÆ CAR'BONAS VENA'LE, L.; B
BARIL'LOR, Sp., Lev.; BARILLE,

fluosilicic acid, and by not giving a red colour to the flame of alcohol; from alumina, by its causticity and alkaline reaction, and by not being precipitated from its solution in water by ammonium sulphydrate.

Pois., *&c.* The sulphate, owing to its insolubility, is the only salt of barium which is not poisonous.—*Symp.* Nausea, vomiting, pains in the head, ringing in the ears, vertigo, and intermitting cramps and convulsions; the respiration is frequently suspended for several moments, and the pupil is generally dilated. The symptoms, however, often vary, and are not very distinctive.—*Treatm.*, *Ant.*, *&c.* Vomiting, followed by copious draughts of water soured with sulphuric acid, or sulphate of soda (*Glauber-salt*) or sulphate of magnesia (*Epsom-salt*), dissolved in a large quantity of water. When carbonate of barium has been swallowed, a mixture of one of the above sulphates and weak vinegar should be taken after the vomiting, in order that a soluble barium salt may be first formed, on which the alkaline sulphate will act more readily. Subsequent irritation may be soothed by opium or morphia, and antiphlogistics.

Barium, Ac'etate of. $Ba(C_2H_3O_2)$. *Syn.* BARY'TÆ ACE'TAS, L. *Prep.* From dilute sulphuric acid, neutralised with carbonate of barium, and the solution evaporated and crystallised. Very soluble in water; insoluble, or nearly so, in rectified spirit.—*Uses, Dose, &c.* Same as the chloride. It is seldom employed.

Barium, Arse''niate of. $Ba_3(PO_4)_2$. *Syn.* BARY'TÆ ARSE''NIAS, L. *Prep.* A *solution* of *chloride of barium* is added to another of *arseniate of potassium* or *sodium*, and the precipitate collected, washed, and dried. By dissolving this salt in a *solution* of *arsenic acid*, and crystallising, BINARSE''NIATE OF BARIUM is obtained. Has been recommended in certain skin diseases, and in phthisis complicated with scrofula.—*Dose.* $\frac{1}{16}$ to $\frac{1}{4}$ gr.

Barium, Ar'senite of. $Ba(AsO_2)_2$·. *Syn.* BARY'TÆ AR'SENIS, L. Very slightly soluble. —*Use, &c.* As the last.

Barium, Bromide of. $BaBr_2$. *Syn.* BA''RII BROMI'DUM, L.; BROMURE DE BARYUM, &c., Fr. *Prep.* Boil a solution of *protobromide of iron* with *moist carbonate of barium*, in slight excess; filter, evaporate to dryness, and heat the residuum to redness. By careful evaporation of its aqueous solution it may be obtained in crystals. It is soluble in both alcohol and water, and its physiological properties resemble those of iodide of barium.

Barium, Carbonate of. $BaCO_3$. *Syn.* CARBONATE OF BARY'TA; BARY'TÆ CAR'BONAS, L.; CARBONATE DE BARYTE, &c., Fr.; KOHLENSAURES BARYT, &c., Ger. A heavy white mass or powder, very nearly insoluble in water, and decomposed by nearly all the acids. It is found in the crude state abundantly in nature, but can only be obtained absolutely pure by *adding an alkaline* carbonate to a solution of *chloride of barium*, or by saturating the
hydrate with carbonic anhydride, a
case washing and drying the
Native carbonate of barium (
ordered in the pharmacopœias,
ciently pure for making the barim
only purpose to which it is therein

Uses. In *pharmacy*, &c., chiefly
barium salts. In *chemistry*, to sepa
metallic oxides when occurring tog
lutions. In the *arts*, as a base for
licate colours, as an ingredient in
in the manufacture of beet-sugar,
not used in medicine. It is extr
sonous.

Barium, Chloride of. $BaCl_2$. .
CHLORIDE OF BARIUM; BARII CHLC
CHLORURE DE BARYUM, CHLORH
BARYTE, &c., Fr.; SALZSÄURE SC
CHLORBARIUM, Ger. Neutralise
solution of hydrochloric acid with
of barium, evaporate down, and
Sulphide of barium can be substitu
carbonate. If required chemic
gaseous hydrochloric acid is
through a concentrated solution
or impure chloride of barium, as
precipitate forms; the resulting
powder, which is nearly the wh
chloride of barium present, is coll
filter, and, after draining, is washed
with small quantities of pure hydroc
until the washings, diluted with
precipitated with sulphuric acid, gi
which, upon evaporation in a platin
or a watch-glass, leaves no residu
traces of acid having been removed
alcohol, applied in a like manner,
is at once dried, and then carefull
from the air.—*Used* in analysis.

Prop., *&c.* Crystals, flat four-s
colourless and transparent; someti
eight-sided pyramids; slightly effl
dry warm air, but otherwise pern
crepitate when heated, and lose th
crystallisation; fuse at a red heat
at a white heat; insoluble in hydrc
and in alcohol, slightly soluble
spirit, and very soluble in water
60°, dissolves 43¼ § of the crystals,
37⅝ of the dry salt; and when b
of the former, and about 66⅝ of
a saturated boiling solution (223°
tains 100 parts of water, and 78
crystallised salt.

The crystals contain 2 atoms of
a formula of $BaCl_2 + 2Aq$.

Uses, Phys. eff., *&c.* In *chemist*
ployed as a test for sulphuric acid
luble sulphates. In *medicine*, it
employed, both internally and exte
alterative, resolvent, and deobstrue
fula, glandular swellings, and en
scirrhous cancer, skin diseases, &c.
particularly in the first with marl
In large doses it is poisonous. A
Sir B. Brodie, its action on anim

t of arsenic. Locally, it acts as an
very weak solution, used as a
n proves serviceable in herpetic
nd as a collyrium in scrofulous oph-
Dose. $\frac{1}{2}$ gr. thrice a day, in water,
creased to 2 or 3 grs.

Chlo″rate of. $Ba(ClO_3)_2$. *Syn.*
OF BARY′TA; BARY′TÆ CHLO″-
Prep. From a solution of chloric
lised with freshly precipitated car-
barium; the resulting solution,
ion, being crystallised by evapora-

ing chlorine through strong milk
or of carbonate of barium, in
way as in making chlorate of

e. Soluble in 4 parts of cold water.
pyrotechny, and to make chloric

Ferrocy′anide of. $Ba_2FeC_6N_6$.
′RII FERROCYANI′DUM, L. From
cyanide of iron digested in baryta-
ly careful evaporation, efflorescent
crystals may be obtained, soluble in
of water.

Flu′oride of. BaF_2. *Syn.* BA″RII
UM, &c., L. A white powder, formed
ing freshly precipitated carbonate of
n hydrofluoric acid, in excess.

Hydrate of. $Ba(HO)_2$. *Syn.* HY-
OF BARYTA; BARYTÆ HYDRAS, L.
By digesting caustic baryta, or barium
ith a little water, or igniting gently
llised hydrate. It can be obtained
ed as follows:—
m a concentrated solution of either
or chloride of barium, precipitated
ther strong solution of pure potassa,
re soda, perfectly free from carbonic

trong solution of sulphide of barium is
th successive portions of black oxide
; until it ceases to give a black pre-
with a salt of lead; the liquid, after
yields crystals of the hydrate on

Uses, &c. Forms a bulky white
containing 10¼ % of water of hydra-
h it retains even after ignition. In
it is soluble in 20 parts of cold
d in 2 parts of boiling water. The
ated solution, as it cools, deposits
y columnar crystals (CRYS′TALLISED
OF B.), which contain 51½ % of water,
they lose, by drying and ignition,
15¾ % of their weight), being reduced
te of the common or amorphous hy-
f *all* the bases it has the strongest
r both sulphuric and carbonic acid;
e its solution (BARY′TA-WATER) and
its neutral salts (*nitrate* or *chloride*)
most sensitive *tests* for these sub-
Sp. gr. 4·3 to 4·7. The *crystallised*
s converted into the ordinary hydrate
e heat, and this last fuses at a low red heat without losing its water of hydration, which it only slowly and with difficulty begins to part with at higher temperatures. In *chemistry*, its uses are, for the most part, similar to those of BARIUM, OXIDE OF.

Barium, Io′dide of. Ba_2I. *Syn.* BA″RII IODI′DUM, L.; IODURE DE BARYUM, &c., Fr. *Prep.* 1. Dissolve sulphide of barium in water, and add iodine (gradually) in excess; after the reaction is complete, filter, and either evaporate to dryness, or crystallise.

2. Digest freshly precipitated carbonate of barium, in excess, in a hot solution of protiodide of iron; filter and evaporate to dryness; then re-dissolve and crystallise.

3. By saturating hydriodic acid with oxide or carbonate of barium.

Prop., &c. A white or greyish-white mass, or acicular crystals (according to the mode of its preparation); very soluble in water and in alcohol; and decomposed by exposure to the air. It has been highly recommended as an alterative, resolvent, and liquefacient, particularly in scrofula, glandular swellings, chronic inflammations, and the other affections in which chloride of barium and iodine are given.—*Dose.* $\frac{1}{12}$ to $\frac{1}{8}$ gr. (gradually and cautiously increased to 1 gr.), in distilled water, 2 or 3 times a day. *Externally*, as an ointment (3 or 4 gr., to *lard*, 1 oz.), as an application to scrofulous swellings. (Biett.) It possesses all the irritant, corrosive, and poisonous properties of the chloride, but in a much more violent degree.

Barium, Ni′trate of. $Ba(NO_3)_2$. *Syn.* NI′TRATE OF BARYTA; BARY′TÆ NI′TRAS, L. *Prep.* As the acetate or chloride of barium, substituting pure nitric acid for acetic or hydrochloric acid.

Prop., &c. Transparent, colourless octahedrons, which are anhydrous, insoluble in alcohol, and require about 8 parts of cold water, and about 3 parts of boiling water, for solution.

Uses. In *chemistry*, to prepare baryta, and as a test for sulphuric acid and the soluble sulphates; and in *pyrotechny*, to give a green tinge to flame.

Barium, Ox′alate of. BaC_2O_4. *Syn.* OX′ALATE OF BARYTA; BARY′TÆ OX′ALAS, L. *Prep.* By precipitating a barium salt with oxalate of ammonium. Very nearly insoluble.

Barium, Oxide of. BaO. *Syn.* BARYTA, BARY′TES, CAU′STIC BARYTA*, OX′IDE OF BA″RIUM, PROTOX′IDE OF B., HEAV′Y EARTH; BARYTE, OXIDE DE BARIUM, TERRE PESANTE†, &c., Fr.; BARYT, BARYTERDE, SCHWERERDE, &c., Ger. One of the earths discovered by Scheele in 1774.

Sources. Sulphate and carbonate of barium are abundant minerals, forming the 'veinstone' of many lead-mines. It is from the *latter that baryta and the* barium salts are almost exclusively obtained.

Prep. 1. A mixture of carbonate of barium and charcoal (both in fine powder and moistened) is strongly ignited, for some time, in a porcelain, Hessian, or black-lead crucible, and then allowed to cool out of contact with the air, from which it must also be subsequently carefully preserved.

2. (Pure.) Crystallised nitrate of barium is calcined in a capacious covered porcelain or Hessian crucible, at a bright red heat, until red (nitrous) vapours are no longer disengaged, even on raising the temperature; and the residuum, as soon as the temperature has fallen sufficiently, but whilst still warm, is at once transferred to a bottle, as before.

Prop. A greyish-white, spongy, earthy-looking mass, fusible only before the oxy-hydrogen blowpipe; highly caustic, corrosive, and alkaline, and slaking, like quick-lime, on the addition of water, but with the evolution of more heat.

Barium, Peroxide of. BaO_2. *Syn.* DEUTOX'IDE OF BARIUM; BA''RII BINOX'YDUM, &c. L.; BINOXIDE DE BARYUM, &c., Fr. *Prep.* Pure baryta is heated to full redness in a porcelain tube, and a stream of pure dry oxygen passed over it as long as the gas is absorbed.

Baryta, 4 parts, is heated as above in a platinum crucible, and *chlorate of potassium*, 1 part, gradually added to it; the chloride of potassium formed along with the binoxide being afterwards washed away with cold water.

Prop., &c. Grey or greyish-white; with water it forms a hydrate, which is slightly soluble in water, and undecomposed by it in the cold. It is interesting chiefly in its relations with peroxide of hydrogen and the oxygenised acids of M. Thénard.

Barium, Phosphate of. $Ba_3(PO_4)_2$. *Prep.* In a similar manner to the oxalate, which it resembles in being an almost insoluble white powder.

Barium, Sulphate of. $BaSO_4$. *Syn.* SULPHATE OF BARYTA, HEAV'Y SPAR, BOLO''GNIAN S., CAWK (mi); BARY'TÆ SUL'PHAS (Ph. E. & D.), SPA'THIUM PONDERO'SUM, &c., L.; SULFATE DE BARYTE, SPATH PESANT, &c., Fr.; SCHWEFELSAURES BARYT, SCHWERSPATH, &c., Ger. This salt is found native, often in beautiful tabular crystals, but more frequently in white or reddish-white masses. It is also occasionally prepared artificially, as a pigment and chemical, by decomposing a solution of chloride of barium with dilute sulphuric acid, or with a solution of sulphate of sodium; the resulting precipitate being collected, well washed, and dried.

Prop., &c. When pure, or free from iron, its powder is white. It is insoluble in water, and nearly insoluble in all other menstrua. Before the blowpipe it decrepitates, fuses with great difficulty (by which it is distinguished from the sulphates of strontium and calcium), and ultimately melts into a hard, white enamel. Mixed with charcoal, and heated to redness in a covered crucible, it is reduced to
sulphide of barium. It is readily deco
by fusion with alkaline carbonates; al
slightly so by their cold solutions; bu
mately completely, though slowly, by
boiling solutions. Sp. gr. 4·3 to 4·75.

Uses. Chiefly as a pigment (PER'M
WHITE), and to adulterate white-lea
which purposes the native sulphate is
monly well washed, first in very dil
phuric acid, and afterwards in pure wa
remove any iron which may contam
and impair its whiteness. It is also u
form sulphide of barium; and, in *pyr*
instead of the more expensive nitrate.

Barium, Sulphide of. BaS. *Syn.*
PHIDE OF BARIUM, SUL'PHURET OF BA
BA''RII SULPHURE'TUM, &c., L.; SULFU
BARYUM, &c., Fr. *Prep.* *Sulphate of b*
well dried and in fine powder, 3 parts;
dered charcoal or *powdered coal*, 1 part
mixture is pressed tightly into an e
crucible, and the cover being fitted on,
exposed for 1½ to 2 hours, to a bright
heat; after it has cooled, the black mass
obtained is powdered, and boiled in wat
the resulting solution allowed to cryst
Some authorities recommend forming
mixed powders into a stiff paste with
oil of turpentine, before calcination; but
is not at all necessary.

Prop., Uses, &c. Crystals, thin and
colourless plates, containing combined wa
very soluble in hot water, less so in cold wa
and rapidly decomposed by exposure to
air. It is principally used to form the
RIUM SALTS, and in organic analysis.
should be taken in its preparation to ex
the solution to the air as little as pos
SULPHIDES of a higher grade may be for
by boiling this compound with sulphur;
they possess little practical interest.

Barium, Sulphite of. $BaSO_3$. *Syn.* S
PHITE OF BARYTA. *Prep.* By testing a
uble barium salt with sodium sulphite,
washing the precipitate. Insoluble.

Barium, Tartrate of. $BaC_4H_4O_6$. *Syn.* T
TRATE OF BARYTA. *Prep.* Like that of ox
of barium. White powder. Slightly solu

BARK. [Eng., Dan.] *Syn.* COR'TEX,
ÉCORCE, Fr.; BAUMRINDE, RINDE, Ger.
rind or exterior covering of vegetables, co
sponding to the skin of animals. It cons
of the—*cu'ticle* or *epiderm'is*—*cellular*
stance, containing colouring matter, &c.,
—*li'ber*, the inner or true bark. The las
formed of woody fibre in great quantity,
termixed with cellular tissue. At the c
mencement of the annual growth of a t
the bark separates spontaneously from
wood, in order to make room for the new
ter forming beneath. It thus increases
yearly layers, and gradually perishes on
outside, owing to distension, from the grow
of the interior portion. Its physiological u
are numerous and important. It is the
pository of many of the secretions of pla

as a living filter, separating secre-
each other, and allowing a part of
pass off horizontally through the
processes on their way to the centre
. But its principal offices appear to
s a protection to the tender wood,
channel for the sap in its descent
eaves. "True bark only exists in
d *gymnosperms*; in *endogens* its
plied by cortical integuments, which
separated from the adjacent wood,
olence." (Lindley.)

g to Liebig, the characteristic in-
ound in bark are excrementitious—
s evidently expelled by the living
True wood yields only ·25% to
whilst the bark of some trees give
5 times more; and these, like the
nstituents, differ materially in their
n and characters.

of different species of bark in me-
the arts are well known. CINCHONA-
valuable in fevers; OAK-BARK fur-
tanner with one of the most im-
terials of his trade; and the tena-
of other varieties are manufactured
ge and textile fabrics.

ould be collected at that season in
can be most easily separated from
which, with a few exceptions, is late
ng; because at this time the active
deposited in their cells are most
OAK-BARK, collected in spring,
ur times as much astringent matter
lected in winter.

In *medicine*.) See CINCHONA.

In *tanning*.) See OAK-BARK.

s'uit's. Cinchona-bark.

alt of (Essential). See EXTRACTS
.

Y. *Syn*. HOR'DEUM, L.; ORGE, Fr.;
ler., Anglo-S. A well-known grain,
ce of several species of the genus

ult., &c. Those principally cultivated
d are—TWO'-ROWED, LONG'-EARED,
ON BARLEY (*hor'deum dis'tichon*,
PRING'-BARLEY, SQUARE'-B., *or* BERE
re, Linn.); and SIX'-ROWED BARLEY,
L., Scotch BERE *or* BIGG (*h. hexas'*-
m.). PUT'NEY, SPRAT, *or* BATT'LEDORE
riton, Linn.), is another species less
met with. Of each of the above
everal varieties. In Spain and Sicily,
of barley are obtained in a year;
untries so far north as Britain, it
nly one, and is a delicate species of
England it is generally adopted as
on crop on light lands, following
green crops. (Loudon.) The 'yield'
varies from 28 to 64 bushels, and is
m 28 to 40 bushels. The average
r bushel is 50 to 51 *lbs.*; but the
olk and Essex samples weigh 53 *to*
r bushel.

The leading constituents of barley are nearly similar to those of wheat, but it is scarcely so rich in nitrogenised matter. According to Einhof, the ripe SEEDS *or* GRAINS are composed of—

Meal	70·05
Husk	18·75
Moisture	11·20
	100·

According to Johnston, average fine BARLEY-MEAL contains—

Starch	68·
Albumen, gluten, &c.	14·
Fatty matter	2·
Ash or saline matter	2·
Water	14·
	100·

According to Dr. Ure, the sp. gr. of ENGLISH BARLEY is 1·25 to 1·33 (*average*, 1·235), and the weight of the husk is about 1-6th; that of BIGG, 1·227 to 1·265, and weight of husk, 2-9ths.

Qual., Uses, &c. Its employment and value as food, and in the manufacture of malt, are well known. It forms good wholesome bread well adapted for persons who live luxuriously; but which, for the abstemious and the delicate, is inferior to that made of wheat, as it is rather less nutritious, and less easy of digestion, and commonly proves laxative to those unaccustomed to its use. *Barley-flour* and *b.-meal* are also more perishable than wheat-flour; being very apt to acquire a hot nauseous taste, which even the heat of the oven does not remove. In a medical point of view, barley is regarded as the mildest and least irritating of the cereals. It has always been in high estimation as a demulcent and emollient. The decoction (BAR'LEY-WATER), made with pearl barley, is a common and useful drink in inflammatory diseases, particularly in those of the chest and urinary organs. Among the Ancients, decoctions of barley (κριθή) were the principal aliments and medicines employed in acute diseases.

Barley, Cau'stic. Sabadilla.

Barley, Pat'ent. *Syn.* FARI'NA HOR'DEI, L. *Pearl barley* reduced to fine powder by grinding in a mill.

Barley, Pearl. *Syn.* PEARL'ED BARLEY*; HOR'DEUM DECORTICATUM (B.P.), L.; ORGE PERLÉ, Fr.; PERLENGRAUPEN, Ger. The seeds of *hordeum distichon* deprived of the husks. That of commerce is usually made by steaming spring-barley, to soften the skin, then drying it, and grinding it in a mill with the stones set wide apart, so as to round and polish the grains, and to separate the whole of the husk except that left in the furrow of the seed. *SCOTCH PEARL-BARLEY* and FRENCH BARLEY *resemble the last*, but are smaller, being generally made from *winter-barley* or *bigg*. FARO

DE ORZO is another variety made from *sprat-barley*. See BARLEY (*above*).

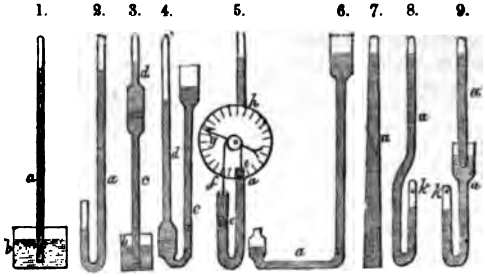
Barley, Scotch. *Syn.* HULLED BARLEY‡, POT-B.‡; HOR'DEUM MUNDA'TUM, L.; ORGE MONDÉ, Fr.; GERSTENGRAUPEN, GRAUPEN, Ger. The grains deprived of the husk by a mill, as noticed above, but less completely, and without rounding them.

BAR'LEY SUGAR. See CONFECTIONERY, and SUGAR.

BARM. See YEAST.

BAROM'ETER (-rŏm'-). *Syn.* W
GLASS‡; BAROM'ETRUM, L.; BA
Fr.; BAROMETER, WETTERGLAS, Ger
strument for measuring the weight o
of the atmosphere. It was invented
celli, of Florence, A.D. 1643.

The barometer is made of several
the principle of its construction, wi
ception of the aneroid barometer, is



1. Torricelli's cistern barometer.
2. ———— syphon ditto.
3. Huygen's barometer.
4. ———— modified.
5. Wheel barometer.
6. Bernoulli's syphon ditto.
7. Aminton's conical ditto.
8. Gay Lussac's ditto.
9. ———————— modified by M. Bunten.

(*a*.) Tube containing a column of mercur
(*b*.) Mercurial cistern.
(*c*.) A column of mercury supporting ano
(*d*).
(*e*, *e*.) Weights, one of which floats on t
the mercury, and by means of the c
the index (*g*).
(*h*.) Graduated dial.
(*k*.) Capillary hole drilled laterally to ad

in each, and essentially consists of a column of fluid (usually mercury) supported in vacuo, in a glass tube, by the pressure of the atmosphere on its surface. The annexed *engr.* exhibits the principal varieties at present known; several of which have been proposed with the view of improving the original instrument, either by increasing its range, or its portability. None, however, equal in simplicity, cheapness, and usefulness, the old forms proposed by Torricelli, and repr. by the figs. 1 & 2. To avoid confusion, the graduated scales and cases of the instruments are not shown.

The construction of a barometer requires the utmost skill and care of a practised artist, and will therefore be seldom undertaken by the amateur or experimentalist—a fact which renders it unnecessary for us to enter into the details here. In the choice of his instrument, the purchaser must greatly depend on the known experience and integrity of the manufacturer; as nothing but lengthened use, and frequent comparisons with other instruments, can possibly prove its excellence. An ordinary barometer, however carefully made, is found to suffer gradual deterioration, from the external air insinuating itself between the mercury and the glass tube, by which the perfection of the vacuum is destroyed. Various plans have been proposed to remedy this inconvenience and source of error. Prof. Daniels forms the bottom part of the tube, to the extent of about ⅓rd of an inch, of solid platinum, welded to the glass. This plan has proved completely

satisfactory. Dr. Ure proposes t
platinum-foil for the same purpose
purchasing an instrument it is as wel
tain that this has been done. In t
'STANDARD BAROMETERS' the scale
and adjustable by a delicate screw
enable the observer to bring the l
or zero (0) of the scale coincident
surface of the mercury in the cister
contact is readily effected by m
point, and its image as seen by
from the surface of the mercury, t
In this case the cistern is made of g
vided the ivory scale be connected
zero-point with a strip of brass, co
to temperature is very nearly effect
simple adjustment. The WHEEL-B.
is chiefly serviceable as a domest
weather-glass.

Uses, &c. The barometer is em
ascertaining the amount of atmosp
fraction in astronomical calculatio
measuring altitudes, and in progr
the weather. For the last purpose
it sometimes proves a false proph
sea, its monitions are highly trustw
a mere *weather-glass*, the indicatio
off from the scale of the instrument
rally sufficiently accurate; but in a
tions connected with meteorology,
astronomy, &c., certain correction
made; the height of the mercury
fluenced both by the size of the tu
the temperature of the air by which

the *above subject* the reader is referred to the 'articles' Aneroid, Atmosphere, Gas, Heights, Steam, Storm-glass, Vapour, Weather, &c.]

BAR'OSCOPE† (-skōpe). [Eng., Fr.] *Syn.* Barosco'pium, L. A barometer; sometimes applied to the wheel-barometer, of Hooke.

BAR'RAS. The concrete resinous exudation from the bark of fir-trees. That from *pi'nus marit'ima* is called galipot.

BARSE. [Provincial.] The common perch.

BAR'WOOD. A red dye-wood imported from Angola and other parts of Africa. It closely resembles cam-wood and sanders-wood in its colouring matter being of a resinous nature, and scarcely soluble in water. In *dyeing*, this difficulty is obviated by taking advantage of the strong affinity existing between it and the proto-salts of tin and iron. Thus, by strongly impregnating the goods with protochloride of tin, either with or without the addition of sumach, according to the shade of red desired, and then putting them into a boiling bath containing the *rasped wood*, the colour is rapidly given out and taken up, until the whole of the tin in the fibres of the cloth is saturated, and the goods become of a rich bright hue. In like manner the dark red of bandana handkerchiefs is commonly given by a mordant of acetate of iron followed by a boiling bath of this dye-stuff. See Dyeing, Mordants, &c.

BASALT' (bă-sŏlt').[1] [Eng., Ger.] *Syn.* Basal'tes (-săl'-tēz), L.; Basalte; Fr. In *geology*, &c., a species of trap-rock, essentially composed of the minerals felspar and augite. It is of a fine compact texture, of a dark-green, gray, or black colour, and usually occurs in regular columns, of which the Giants' Causeway and the Island of Staffa furnish magnificent examples. It is fusible; and when rapidly cooled forms a dark brittle glass; but when slowly cooled retains its original beauty and hardness almost unimpaired. Messrs. Chance, Brothers, of Birmingham, have availed themselves of this property to apply it to decorative and ornamental purposes. Their process is to melt the material[2] in a reverberatory furnace, and, when sufficiently fluid, to pour it into red-hot moulds of sand encased in iron boxes. The corresponding *adj.* is basalt'ic (-sŏlt'-; basal'ticus, -săl'-, L.; basaltique, Fr.).

BASE. [Eng., Fr.] *Syn.* Ba'sis (*pl.*, ba'ses), L., Gr.; Grund, Grundfläche, Ger. *In chemistry*, it was formerly, and is now occasionally, applied to metallic oxides which possess the property of forming salts with acids. The *alkaloids* are also designated *organic bases*. *In pharmacy*, the characteristic or principal ingredient in any medicine or compound preparation; or that on which
ties or efficacy depends.

BAS'IL (băz'-). *Syn.* Sweet bas'il,
B.; Basil'icum, L.; Basilic, Fr.;
ikum, Ger. The *oc'ymum* (ŏs'-)
(Linn.), an annual aromatic herbac
of the *nat. ord.* Labiatæ (DC.). It
of India, but is largely cultivated
part of Europe as a pot-herb. Leave
scented; popularly reputed emme
much used to flavour salads, soups,
cially in French cookery. *Mock-tur*
derives its peculiar flavour from this
also did the original Fetter-lane
once so highly esteemed by Cockn
mands. In India it is commonly em
an anodyne, in childbirth.

BAS'IL (băz'-). *Syn.* Bas'an; Ba
A sheep-skin, tanned; particularly one
on the grain-side, for book-binding.

BASIL'ICON. See Cerates and Oi

BAS'KET (băs'-). *Syn.* Coph'inus
L.; Panier, Corbeille, &c., Fr.; Ko
Baskets are generally stained or co
with the simple liquid dyes used for
wood; and that, for variegated wo
twigs, after being carefully peeled,
and wiped dry or slightly air-dried, are
before being woven. See Osiers, &c.

BASS‡. [Provin.] The linden-tree
hassock or mat made of its inner bar
Bast.

BAS'SORIN (-rĭn). *Syn.* Bassori
A substance first noticed, by Vauqu
Bas'sora-gum. See Insoluble Gum,
canthine, &c.

BAST (băst). *Syn.* Bass (which
inner bark of the *linden-tree* or *tiel-tr*
matting, &c., made of it.

BAS'TARDS (-tărdz). *Syn.* Bas'tard
(shŏŏg'-), Pieces, &c. In *sugar-refin*
pure or damaged sugar resulting fr
heat and chemicals used in the process
nufacture, and which will not pay f
fying.

BA"SYL (bāse'-ĭl). In *chemistry*, any
or compound body, acting as a basic ra

BATH (bahth). *Syn.* Bal'neum, L.
Fr.; Bad, Ger., Sax. A place for b
a vessel or receptacle, natural or artifici
taining or adapted to contain water, a
to bathe in. In *architecture* and *hy*
building fitted up for, and appropri
bathing.

Constr., &c. Here one of the first
which must engage our attention is th
tion of the material of which the bath
formed. For fixed baths polished
marble has always been in favour, owin
cleanliness and beauty. For this p
slabs of sufficient thickness and fre
flaws or cracks should be chosen; an
should be securely and properly bedded
water-tight cement, in a well-seasoned
case. The objections to marble, indep
of its costliness, are, that it is apt to ge

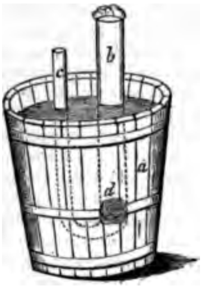
---

[1] *Ba'salt*—Mayne; a 'notation' contrary to that of *all* our leading orthoepists and lexicographers.

[2] Rowley-rag is used by the Messrs. C.; as beside ordinary basalt, *greenstone*, *whinstone*, and other similar *minerals*, *possess the same property*.

waste water removed without trouble or inconvenience. The basement story should always be avoided; for, as observed by Dr. Ure, there is a coldness and dampness belonging to it, in almost all weathers, which is neither agreeable nor salubrious.

8.



(*a.*) Bath-tub.
(*b.*) The larger arm of the warming-tube by which the charcoal is introduced, and by which the fumes fly off.
(*c.*) The smaller arm to admit air to support the combustion.
(*d.*) The fire grate, to support the burning charcoal.

The ranges of the temperature of water appropriate to the respective baths, according to the common nomenclature, are shown in the following Table:—

Name.	Temperature. Fahr.
Cold bath	83° to 75°
Temperate bath	75 „ 82
Tepid bath	82 „ 90
Warm bath	90 „ 98
Hot bath	98 „ 112

Concluding remarks. The importance, and indeed, the absolute necessity of frequent personal ablution, has been already insisted on and explained. But however important and beneficial the use of water in this way may be, the effects arising from the immersion of the body in that liquid, as in the practice of bathing, are far more extensive and complete. What the one does usefully but not completely, the other accomplishes readily, satisfactorily, and perfectly. There is no absolute succedaneum for the entire bath. Its physiological effects are peculiar to itself, and of the utmost importance in pathology and hygiène. The practice of wearing flannel, the daily use of clean linen, the mere washing of the more exposed parts of the body, are but poor attempts at cleanliness, without the occasional, if not frequent, entire submersion of the body in water. Nor should the action of judicious bathing in the promotion of personal comfort and personal beauty be forgotten. Intellectual and moral vigour are also gradually, but materially, influenced and promoted b
action of bathing on the syste
and conscience being linked to
'house we live in,' become pe
thargic, in almost exact accord
fluctuations of our physical
neglect of bathing in this cou
an absolute enigma. We are
about health, and continually p
seeking it; but the practical
the principles which we adv
doctrines which we teach, are,
the exceptions and not the rule.

Our recommendation of b
chiefly to the warm bath and t
which are alike adapted to th
the robust, and to every condit
and season. Cold bathing, in
only suited to the most health
and can only be safely practis
warmer months of the year, an
water sufficient to permit of t
body being maintained by swim
active exercise. The plunge an
are partial exceptions to th
whilst sea-bathing, for the reas
where, comes under another c
last, "on account of its stimula
trating power, may be placed
those means which regard the c
and it certainly supplies one
wants of the present generatio
the pores, and thereby re-inv
whole nervous system." "Be
power in cases of disease, it ma
by those who are perfectly well,
most agreeable to nature for
the body and preserving the heal
important advantage which se
over bathing in fresh water is,
seldom take cold from indulging

We may add, that for bathing
best effects, the water should be
and good soap sparingly, but
ployed whenever the skin requir

The medical and hygienic prop
are noticed below, under the
names;—

Bath. In *chemistry*, &c., a v
ratus containing some medium
vessel holding the substance to b
mersed, instead of being exposed
action of the fire; by which m
and uniform temperature may be

The highest temperature that
to any substance contained in a
in another of boiling water, is
206° Fahr.; but by adding ⅛th p
salt to the bath, a heat of full
obtained. Baths of fusible me
solutions of salt, sand, and (
scale) steam, are also used for t
pose. A bath of oil may be sa
about 500° Fahr. without sufferi
tion, and will be found an exce
priate and convenient source of

beiran.) In lumbago and certain skin diseases; also as a counter-irritant.

Bath, Antipso"ric. *Syn.* BAL'NEUM ANTIPSO"RICUM, L. See SULPHURETTED BATH (also others both *above* and *below*).

Bath, Aromat'ic. *Syn.* BAL'NEUM AROMAT'ICUM, L. *Balm, chamomile, lavender, mint, rosemary, sage, thyme,* with any other like aromatic herbs (at will), of each, a handful, mixed together and steeped in a (covered) pail of boiling or very hot water, for an hour, and then strained, with pressure, into the bath. Sometimes 2 or 3 *oz.* of *sal-ammonia,* a ½ *lb.* of *alum,* or 1 *lb.* of *common salt,* is also added. Occasionally used in cutaneous affections, chronic rheumatism, diarrhœa, dyspepsia, stiff-joints, &c.; also in debility arising from loss of blood, spermatorrhœa, suppressions, hysteria, hypochondriasis, &c.

The AROMATIC VAPOUR BATH is made by causing the *vapour* to pass through the herbs.

Bath, Astrin'gent. *Syn.* BAL'NEUM ASTRIN'GENS, L. *Prep.* (Most.) *Alum,* (2 to) 4 *lbs.;* dissolve in *boiling water;* and add, *whey,* 6 or 8 pailfuls, or q. s. In extensive burns, piles, prolapsus ani, &c. See ALUM BATH, OAK-BARK BATH, &c.

Bath, Balsamic. *Syn.* BAL'NEUM BALSAM'INUM, L. *Bordeaux turpentine* and *tar,* of each, 2 *lbs.* (or of *tar* alone, 3 to 4 *lbs.*); *hot water,* 6 or 7 galls.; stir continuously until nearly cold, then add the clear portion to *water,* q. s. to form a bath. In mumps, pruriginous diseases of the skin, eczema, impetigo, &c.

Bath, Barèges (Factitious). *Syn.* BAL'NEUM BARETGINEN'SE (Factitium), L. *Prep.* 1. *Crystallised sulphuret of sodium,* 3½ oz.; *chloride of sodium,* 1½ oz.; *gelatine* (dissolved), 4 oz.

2. (Trousseau & Reveil.) *Dry sulphuret of potassium,* 4 oz.; *water,* 16 oz.; dissolve, and add the solution to the bath; then further add, of *sulphuric* or *hydrochloric acid,* ½ oz., previously diluted with *water,* 8 oz. In itch, moist skin diseases, chronic diarrhœa, chronic rheumatism, lead colic, &c. See BALLS, WATERS, &c.

Bath, Benzo'ic. *Syn.* BAL'NEUM BENZO'ICUM, L. 1. *Benzoin* (in powder), ½ *lb.; water* (at 90°) q. s. In irritations, hysteria, hypochondriasis, &c. It is also reputed to be feebly aphrodisiac.—2. A common warm bath, with a little powdered benzoin laid on a heated plate near the bather, so that the fumes may be inhaled. Slightly soothing or anodyne; in chronic laryngitis, relaxed uvula, &c.

Bath, Bichlo"ride of Mer'cury. See MERCURIAL BATH.

Bath, Bran. *Syn.* BAL'NEUM FUR'FURIS, L. *Bran,* 5 to 7 *lbs.; boiling waters,* 2 or 3 galls.; *digested* together for an hour, or boiled for 15 minutes; the strained liquid being added to the bath. Emollient; in dry and scaly skin disease, and to allay itching and surfacial irritation; also to promote suppuration, &c.

Bath, Cam'phor. *Syn.* BAL'NEUM CAM'PHORÆ, B. CAMPHORATUM, L. *Camphor,* 3 or 4 drs., coarsely powdered, and pl plate heated by boiling water, in th room. Anodyne, anaphrodisiac, and retic; in spasmodic asthma, chronic relaxation of the uvula, ardor urinæ, irritability, &c.

Bath, Carbon'ic. *Syn.* CARBON' BATH; BAL'NEUM CARBON'ICUM, B. CARBONICUM, L.

1. *Carbonic acid gas* applied, by a suitable apparatus, to prevent its respired. Antiseptic, diaphoretic, and to the vascular system; in chlorosis, hysteria, scrofula, other ulcers (particularly foul ones), &c.

2. *Water,* at 50° Fahr., charged *gas.* Powerfully antiseptic and foul ulcers, gangrene, &c.

Bath, Chlo"ride of Ammo"nium. *Syn.* NEUM AMMO"NII CHLORI'DI, B. HYDROCHLORA'TIS, L. *Sal-ammoniac,* or even 4 *lbs.* In chronic inflammatio dular enlargements and indurations, rheumatism and affections of the joi corrhœa, chilblains, frost-bites, &c.

Bath, Chlo"rine. *Syn.* BAL'NEUM RIN'II, B. CHLORINA'TUM, L. *Tepid* to which a little *chlorine* has been Antiseptic, stimulant, and subsequently tive and antiphlogistic; in itch, foul grenous ulcers, chronic liver affecti Chloride of lime is commonly substit chlorine.

2. (Magendie; Wallace.) *Chlorine* tained from *salt,* 1½ oz.; *oil of vitri* *water,* of each, 1 oz.; and *black oxide* *ganese,* ½ oz. to 1 oz.) diluted with temperature of 104° to 150° Fahr., and by means of a suitable apparatus, minutes to ½ an hour; every possible tion being taken to prevent it being In chronic liver affections, gradually tiously increasing the ingredients to times the above quantity, and decreas dilution with *air* until the gas is used pure.[1]

Bath, Cold. *Syn.* BALNEUM FRIG (-frĭj'-), FRIGIDA"RIUM, L.; BAIN FRO *Water,* fresh, saline, or mineral, at perature varying from 33° to about 75 usually understood to apply to water 50° and 70° Fahr. When below 50° it sidered *very cold.* At a temperature from 60° to about 75° it is commonly the healthy and vigorous as a luxury, cleanliness.

" The immediate effects of the cold a sensation of cold (speedily followed of warmth), contraction of the cut vessels, paleness of the skin, diminuti

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[1] A dangerous remedy in careless or unskilful even with the experienced, not always free from The writer of this article once nearly lost his life single inspiration of the gas which accidentally its proper limits. Terrific spasms of the glottis and vulsive cough immediately came on, and lasted, wi or less severity, for nearly 14 hours.

d reduction of the volume of
'ering, and, as the water rises
nd of convulsive sobbing, are
Continued immersion renders
and ultimately imperceptible,
ion difficult and irregular. A
ivity succeeds; the joints be-
inflexible; pain in the head,
. cramps, come on; the tem-
body falls rapidly; and faint-
f death, ensues." "Its primary
e the SHOCK—its secondary
TION or GLOW."[1] Hence it is
of the body in water below
. cannot be tolerated for any
without such a loss of animal
ntly to induce highly sedative
effects, from which the consti-
; readily recover. Water at a
below about 50° Fahr. can only
as a plunge-bath. The sedative
nd mineral waters, is much less
are water, or of spring or river

th, medically considered, is tonic,
l restorative, when judiciously
en not too long continued or too
l. When beneficial, the patient
at glow on the surface of the body
following it. If a sensation of
ivering ensues, it acts injuriously,
ot be repeated. The duration of
n may vary from 2 to 15 minutes,
ime depending upon the tempera-
e water, and the feelings of the
longer period being only proper in
r, and when accompanied by swim-
ient exercise.
edial agent, the cold bath is princi-
mended to increase the tone and
he system; and is contra-indicated
e is a tendency to apoplexy, or to
fections, functional or organic, of
lungs, or kidneys. It should never
when the party feels chilly, languid,
ed; or if drowsiness and shivering

perature of the water of the rivers
sts of England ranges, in summer,
to 70 or 72° Fahr.
uche. See SHOWER-BATH, DOUCHE,

ry. *Syn.* BAL'NEUM SIC'CUM, L. The
n of the body in any dry material,
salt, *sand*, &c. EARTH-BATHING, as
red by the once notorious quack, Dr.
was of this kind. In the *sudatorium*,
ng room, of the ancients, the body
rsed in heated sand.
Elec'tric. *Syn.* BAL'NEUM ELEC'-
L. The patient, placed on an insu-
l, is put in contact, by means of a
ire, with the prime conductor of an
machine in action. The surface of
is thus *rendered electro-positive*, and the surrounding air, by induction, electro-negative. It has been recommended in chronic rheumatism, scirrhous tumours, &c.

Bath, Electro-chem'ical (of Dr. Caplin). This is founded on the supposition that all diseases arise from the presence of mineral, or other extraneous morbific matter, in some organ, or the whole organism, and which is capable of removal by electrolysis. The patient is placed in an appropriately arranged voltaic bath, and there "saturated with the electric fluid." This "decomposes everything which is foreign to the organism, the vital parts being protected by the law of conservation belonging to every organic production." These foreign substances are said to be thus carried out of the system by the electric current, and to be "fixed and plated on the copper in the same way, and according to the same law and principle (only reversed), as in the process of electro-plating."[2]

Bath, Fec'ula. *Syn.* BAL'NEUM AM'YLI, B. FÆC'ULÆ, L. *Potato-starch* or *wheat-starch*, 1 to 4 *lbs.*; *boiling water*, q. s. to dissolve. Resembles the BRAN-BATH.

Bath, Ferru'ginous. *Syn.* CHALYB'EATE BATH; BAL'NEUM FERRUGIN'EUM, B. CHALYBEA'TUM, L. *Green sulphate of iron*, 1 to 2 *lbs.* A well-tinned copper, wooden, or japanned bath, may be used. In general debility when chalybeates are indicated, and the stomach will not bear iron; also in piles and prolapsus. The stains on the towels used to wipe the patient, may be removed by at once soaking them in water acidulated with hydrochloric acid.

2. (Ioduretted.) See BATH OF IODIDE OF IRON.

Bath, Foot. *Syn.* PEDILU'VIUM, L. Warm (or hot). Revulsive, counter-irritant; in colds, menstrual and hæmorrhoidal suppressions, rheumatism, stiffness of the ankles, tender feet, &c. A little *common salt*, *flour of mustard*, or *sal-ammoniac*, is often added to render it more stimulant, to prevent 'taking cold,' &c. See FEET, &c.

Bath, Gelat'inous. *Syn.* BAL'NEUM GELATINO'SUM, B. GELATIN'II, L. *Gelatine* or fine *Salisbury glue*, 3 or 4 *lbs.*; dissolved in *boiling water*, 2 *galls.*, or q. s.; and added to a warm bath. At the 'Hospital for Cutaneous Diseases' 8 *lbs.* of *patent size* is used for a bath of 30 to 35 *galls.* Emollient; formerly, but erroneously, considered nutritive. *Used* in skin diseases; generally combined with sulphur. See BARÈGES BATH.

Bath, Glyc'erin (glĭs'-). *Syn.* BAL'NEUM GLYCERIN'II, B. G. COMPOS'ITUM, L. *Glycerin*, 2 *lbs.*; *gum arabic* (dissolved), 1 *lb.* *Used* as a soothing emollient, in itching, dryness, irritation, and hardness of the skin, &c. Where expense is an object, 3 or 4 *lbs.* of *good honey*, and 1 *oz.* of *salt of tartar*, form an excellent substitute for the glycerin.

Bath, Hem'lock. *Syn.* BAL'NEUM CO'NII, L. 1. *Dried hemlock-leaves* (or *herb*), 4 to 6 handfuls; *water*, 1 gall.; infuse 2 hours, and strain. The part to be immersed in, or bathed with, the warm infusion, observing not to apply it, if the skin is unsound; or it may be added to the water of a bath in the usual manner. In gout, cancer, chronic rheumatism, and certain skin diseases.

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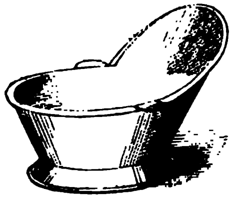
[1] "*Mat. Med. and Therap.*," 4th ed., i, 29.

[2] "*Hist. Records of the Electro-chem. Bath*," by Mons. J. F. J. Caplin, M.D. Baillière, 1860.

2. (Cut. Hosp.) *Extract of hemlock*, 2 oz.; *starch*, 1 lb.; *boiling water*, 1 gall.; dissolve. For a bath of about 30 *galls*. As the last.

Bath, Hip. *Syn.* COXÆLU'VIUM, L. Usually warm; sometimes fully warm, or somewhat hot. In inflammatory, spasmodic, and chronic affections of the abdominal and pelvic viscera; in suppressed and painful menstruation, hæmorrhoids, strangury, prolapsus, ischuria, &c.; also as a substitute for a full bath, when this last is contra-indicated by some affection of the lungs, heart, brain, or great vessels. Like full baths, it may be often advantageously medicated. See BIDET.



Bath, Hot. *Syn.* BAL'NEUM CAL'IDUM, CALDA''RIUM, L.; BAIN CHAUD, Fr. Usual temperature, 98° to 106° Fahr.

The hot bath has a remarkably tranquillising effect upon the nervous system, producing a strong tendency to quietude and sleep. It also acts as a powerful antispasmodic, and by determining the blood to the surface of the body, tends to relieve visceral inflammation and congestion. In chronic affections arising from the action of cold and damp and from exhausted energy, in stiff joints, rheumatism, neuralgia, diarrhœa, and numerous other affections, its effects are often rapid and remarkable. At higher temperatures it strongly stimulates the arterial system, and arouses nervous energy and vital action, producing excessive excitement and turgescence, followed by copious perspiration, which has been often found successful in cholera, paralysis, &c. If the immersion be too long continued, or the bath be injudiciously employed, lassitude, debility, and somnolency ensue, and the good effect of the bath is more or less lost. In these cases violent throbbing and painful distension of the vessels of the head, with a distressing feeling of suffocation and anxiety, are premonitory symptoms of impending apoplexy, an accident which sometimes, though seldom, follows its improper use.

Bath, Hydrochlo''rate of Ammonia. See CHLORIDE OF AMMONIUM BATH.

Bath, Hydrochlo''ric Acid. *Syn.* MURIAT'IC ACID BATH; BAL'NEUM HYDROCHLO''RICUM,
B. ACIDUM H., B. MURIAT'ICUM,
mercial hydrochloric acid, 1 to 3
liver affections); or 3 to 6 fl. oz.
and lichen).

Bath, Hydrosul'phuretted. *Syn.*
HYDROSULPHURE'TUM, L.—1. A
retted bath with the addition of
acid, 2 or 3 fl. drs., immediately
sion. In rheumatism, chronic
hooping-cough, and certain forms
—2. A tepid bath to which 3
(liquid) *hydrosulphate of amm*
immediately before use. *Used* as
often acts almost as a specific in
and certain breath-ailments.

Bath, I'odide of I'ron. *Syn.*
FER'RI IODI'DI, L. *Prep.* (Pierq
of iron, ½ oz. to 2 oz. In ame
corrhœa, chlorosis, scrofula, &c.;
creasing the quantity of the iodid
or more, is used for a bath.

Bath, I'odine. *Syn.* BAL'NEUM
—1. *Iodine*, 3 to 5 drs.; *dry sili*
oz.; triturated together until re
powder, and then agitated with
a *tepid bath* for 10 or 15 minutes
Hosp.) *Iodine*, 4 drs.; *liquor of p*
water, 2 pints; dissolve; for a ba
In skin diseases complicated w
glandular enlargements, amenorrh

Bath, Io'duretted. *Syn.* IO'DU
I'ODISED B., COMPOUND IODINE-
NEUM IODURE'TUM, B. IODURA'T
TAS''SII SUPERIODI'DI, &c., L.
leading authority on this subject,
bath of the different strengths,
the following *Tables*:—

a. For ADULTS:—

Degree.	Iodine.	Iodide of Potassium.
	dr.	dr.
1	2 to 2½	4 to 5
2	2 „ 3	4 „ 6
3	3 „ 3½	6 „ 7

b. For CHILDREN:—

Age.	Iodine.	Iodide o Potassiu
	gr.	gr.
4 to 7	30 to 36	60 to
7 „ 11	48 „ 72	96 „ 1
11 „ 14	72 „ 96	144 „ 1

⁂ The dry ingredients of th
are to be dissolved in a pint of
the second, in ½ pint of *water*,
them to the bath.

In scrofulous affections and th
in which the external use of

ed. Enamelled ware, stone-
vessels must be employed.
Syn. BAL'NEUM CUM CAL'CE,
; slaked, and added to the
ithic diathesis, itch, &c. See

ial. *Syn.* ANTISYPHILIT'IC
MERCURIA'LE, B. HYDRAR'-
DI, B. ANTISYPHILIT'ICUM,
MERCURIEL, B. ANTISYPHI-
. *Bichloride of mercury*, in
o 3 drs.; *hot water*, 1 pint;
until solution is complete,
m to the bath, the 'water' of
in an enamelled or wooden
soft (rain) and pure. At the
hydrochloric acid (=⅓rd the
hloride), is commonly added;
hospitals,' an equal, or rather
qual weight, of sal-ammoniac.
facilitate the solution of the
and its decomposition by any
n the water forming the bath.
n syphilitic affections, either
skin disease; in chronic rheu-
joints, and chronic skin dis-
where the use of mercury is
he remedy is rejected by the
ally in these affections in wo-
n (for the last, proportionately
gth and quantity). Also used
estroy pediculi on the body.
See BATH (in *Chemistry*),
, &c.
Syn. BAL'NEUM LU'TEUM, B.
d-bathing (ILLUTA'TION) was
the ancients. The slime of
mud on the sea-shore, were
for this purpose. The Tartars
still employ baths of this de-
hypochondriasis, scrofula, and
nzenbad, in Germany, an acidu-
black *bog-earth* found there, is
h warm water to a semi-liquid
d used as a bath. This is said
kin satin-like and soft; and to
bility, and in paralytic affections
in. In France, hot dung (DUNG
nally used in rheumatism; and
syphilis. The husk of grapes
e of olives, after undergoing a
ntation, have been successfully
ance against acute rheumatism.[1]
ric*. See HYDROCHLORIC ACID

rd. *Syn.* BAL'NEUM SINA'PIS,
of mustard, 2 *lbs.*; *warm water*, 1
hin soup; in fifteen minutes pour
e linen bag or cloth, and press
which is to be stirred up with
n cholera, diarrhœa simulating
also to cause reaction; the
ing in the bath until a some-
nse of burning and irritation
—2. *Flour of mustard, 3 to 8*

oz.; as before. *Used* as a gentle stimulant to excite the skin, and promote its healthy action, &c.

Bath, Ni'tro-hydrochlo''ric. *Syn.* AC'ID BATH‡ (ăs'-), NITRO-MURIAT'IC B.*, N. A. B.*; BAL'NEUM NITRO-HYDROCHLO''RICUM, B, AC'IDI (ăs'-), B. A. NITRO-HYDROCHLO''RICI, B. A. NITRO-MURIAT'ICI*, &c., L.:—1. *Water* slightly acidulated with the *acid*, so that its sourness to the taste is about that of common vinegar. According to Ainslie, 1 *oz.* of *acid* is sufficient for 1 gall. of *water*.[2] Other formulæ in use are—

2. (Cutan. Hosp.) *Nitric acid*, 1½ lb.; *hydrochloric acid*, 1 lb.; for a bath of 60 to 70 *galls.*

3. (Soubeiran.) *Nitro-hydrochloric acid*, 4 to 16 fl. oz.; according to the case.

4. (Dr. Scott.) *Nitric acid*, 2 fl. oz.; *hydrochloric acid*, 3 fl. oz.; *water*, 5 fl. oz.; mix. 1½ to 2 *fl. oz.* to each *gall.* of *water* for a general bath; 3 *fl. oz.* to the *gall.* for a foot, knee, or sponge bath.

Uses, &c. In its weaker forms, in skin-diseases depending on disordered liver; in others, chiefly in liver complaints, and to relieve the pain on the passing of gall-stones. It must be contained in an enamelled or wooden vessel, and may be used as a hip, knee, or foot-bath; a knee-bath being the one generally adopted in England. Dr. Scott, of Bombay, who first brought this bath into notice, once plunged the Duke of Wellington up to his chin in one, in India, and thus cured him of a severe hepatic affection. In its stronger form it causes tingling and pricking of the skin, and a peculiar taste in the mouth, and affects the gums and salivary glands, often producing plentiful ptyalism, without which, indeed, its advocates regard its action as incomplete. Time of application, 15 to 20 minutes daily, for a fortnight or three weeks; and afterwards, every second or third day.

Bath, Oak-Bark. *Syn.* BAL'NEUM QUER'CÛS B. QUER'CI, L. *Oak-bark*, 3 or 4 handfuls for a child; 10 to 15, for an adult; made into a decoction, and strained with pressure into the bath. In hæmorrhoids, prolapsus, leucorrhœa, hernia, diarrhœa, ill-conditioned and bleeding ulcerations, &c. Drs. Elaesser, Eberle, and Fletcher, have successfully employed it in the intermittents of infancy and childhood, tabes mesenterica or scrofula, &c. It has also proved useful in phthisis.

Bath, Oil. *Syn.* BAL'NEUM OLEO'SUM, L. *Olive* or other oil (hot), strongly aromatised with the *oils* of *cassia*, *cloves*, *nutmegs*, *cedron*, and *juniper*; and digested for a week on *ambergris* and *vanilla*, of each (bruised), about 10 grs. to the gallon. *Used*, in the East, to anoint the body, as a preservative against the plague and other contagious diseases; also as a full bath or hip-bath, the immersion being for 15 to 30 minutes.

Bath, Pneumat'ic. See AIR BATH.

Bath, Saline' (*Gelatinous*). *Syn.* BAL'NEUM

Lem, "Dict. Univ. de Mat. Méd."

[2] "*Mat. Med. Indica*," ii, 340.

SALI'NO-GELATINO'SUM, L.; BAIN DE PLOMBIÈRES, Fr. *Prep. Common salt* and *Flanders glue*, of each 2 *lbs.*; *water*, 1 gall.: dissolve separately, and add the solutions to the bath. In scrofula, &c.

Bath, Salt. See SALINE BATH, SEA BATH, &c.

Bath, Sand. *Syn.* BAL'NEUM ARE'NÆ, L.; BAIN DE SABLE, Fr. See BATH (in *Chemistry*), DRY BATH, &c.

Bath, Sand. *Syn.* BAL'NEUM MARI'NUM, L.: BAIN MARIN, Fr. Immersion in the sea or in recent sea-water (temperate, tepid, warm, or hot). Owing to the saline matter which it contains, it possesses stimulant, alterative, and resolvent properties, superadded to those of pure water at the corresponding temperature. When taken, in summer, on our coasts, the reaction and glow follow more speedily and certainly than after a common water bath; and it may be taken with greater safety, and for a longer period. It often proves very serviceable in diseases accompanied with debility, in phthisis, scrofula, glandular enlargement, &c. A warm or hot sea-water bath is one of the most restorative imaginable; often removing the effects of fatigue and exposure — exhaustion, stiff joints, cramps, rheumatism, &c. —like a charm. See BATH (*above*), WATERS, &c.

Bath, Sea (Factitious). *Syn.* BAL'NEUM MARI'NUM FACTI''TIUM, L. Artificial sea-water, or rather a substitute for sea-water, for this purpose, is commonly prepared by adding about 3% of *common salt* to ordinary *water*.[1] The following are, however, more serviceable imitations:—

1. As above, with the addition of 1 dr. of *iodide of potassium* to every 3 or 4 galls. of *water*.

2 (Cutan. Hosp.). *Common salt*, 8 lbs.; *sulphate of magnesia*, 2 lbs.; *chloride of calcium*, 1 lb.; *water*, 50 to 60 galls.

3. *Salt*, a *handful*; *water*, a *pailful*; *flour of mustard*, 1 *oz.* For a foot-bath.

Bath, Show'er. *Syn.* IMPLU''VIUM, BAL'NEUM PEN'SILE, &c., L.; DOUCHE, Fr. Similar in its effects to the cold bath or plunge-bath; but without many of its advantages. It is less alarming to nervous persons, and less liable to produce cramp, than immersion in cold water; whilst the reaction or glow follows more speedily and certainly. It is considered the best and safest mode of cold bathing, and is often highly serviceable in nervous affections. A good plan is to water to remain in the bedroom by which any undue degree of removed. Tepid water may be with; and at first, in extreme patient may stand in hot or warm time of taking the bath. The reaction ing its use is greatly promoted by the surface with dry rough towels.

Bath, Soap. *Syn.* BAL'NEUM *White soap*, 2 to 3 *lbs.*; *water*, 3 solve by heat, and add it to a warm tergent, lubricating, and discutient; and other skin diseases, &c.

Bath, Spon''ging (spŭnje'-). This plains itself. In the sponging bath and ablution are combined, and its ment by persons of sedentary habit is advantageous.

Bath, Sulphur. *Syn.* BAL'NEUM BRIS, L. 1. *Flowers of sulphur*, ¼ to *water*, a pailful; mix, agitate occasion 12 to 24 hours, and then add the whole ordinary bath. Useful in various obstinate, skin diseases. Its occasion ployment, even in health, seldom fails der the skin soft, smooth, and delicate. may be used with it.

2. (Compound; B. S. COMPOS'ITUM, L. (Cutan. Hosp.) *Precipitated sulphur*, *hyposulphite of soda*, ¼ lb.; *water*, 1 gall. solve, and add of *sulphuric acid*, 1 dr. pint to every 30 *galls.* of *water*. In skin diseases (see *below*).

b. See SULPHURETTED BATH.

Bath, Sul'phurous. *Syn.* SUL'PHUROU BATH; BAL'NEUM SULPHURO'SUM, B. PHURIS‡, L. From *sulphur*, ¼ *oz.*, on a *hot plate* placed under or near tient; the proper *precautions* being directed under CHLORINE BATH. lepra, psoriasis, &c. Cleanly, but seldom chiefly on account of the number of quired to prove serviceable. See SULPH TED BATH.

Bath, Sul'phuretted. *Syn.* BAL'NEU PHURE'TUM, B. SULPHURA'TUM, B. SUL REUM, &c., L.; BAIN SULFURÉ, &c., *Sulphurated potash*, 1 oz.; for every 12 *galls.* of *water* employed. Sometim *phurated soda*, or (in the Ger. hosp.) *rated lime*, is the sulphur-salt employed. of *sulphuric acid* is also occasionally the bath; but this increases its fœtor, adding much, if anything, to its power; whilst, without care, the evolv may impede respiration.

2. (Gelatinous; GELAT'INO-SUL'PHUR B. S. GELATINO'SUM, L.). *Flanders glue*, 2 *lbs.*; dissolved and added to a 'sulph bath.' Recommended, by Dupuytren, substitute for the 'Barèges bath.'

Obs. The sulphur or sulphuretted under any of its forms, is a powerful in almost every description of skin Leprosy, the most obstinate of all, has generally soon bedewed with perspiration; a pleasing and prevailing calm, both mental and physical, follows; and after remaining in it some 12 or 15 minutes the effect is of the most refreshing and happy character.

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[1] Or (say) for small quantities—
1¼ *oz.* to the quart;
5 *oz.* to the gallon.
And for large quantities, as a full bath—
2 *lbs.* to every 7 gallons.

The idea that the warm bath is relaxing, is erroneous. It is only so where persons remain in it too long, or take it too frequently. Nor are those who indulge in it more liable to take cold than others. On the contrary—they are less liable, unless they wilfully expose themselves, insufficiently clad (particularly about the neck and chest), to draughts of cold air.[1]

As a remedial agent, the warm bath is adapted to general torpor of the system, liver and bowel complaints, hypochondriasis, hysterical affections, morbid suppressions, dryness of the skin, nearly all cutaneous and nervous diseases, chronic rheumatism, &c. As a tonic or stimulant after excessive fatigue, great mental excitement, or physical exertion, it is unequalled, and furnishes one of the most wholesome, and at the same time luxurious sources of refreshment we are acquainted with. "To those who are past the meridian of life, who have dry skins, and begin to be emaciated, the warm bath for half an hour, twice a week, I believe to be eminently serviceable in retarding the advances of age." (Darwin.) The healthy longevity of the late Duke of Wellington, after a period of exposure and trials equal to the entire life of many individuals, has been by some, and we think correctly, mainly attributed to the free and constant use of the warm bath. See BATH (*antè*), &c.

Bath, Wa'ter. *Syn.* BAL'NEUM A'QUÆ, B. AQUO'SUM, B. MA''RIÆ, B. MA''RIS, L.; BAIN-MARIE, Fr. A water bath; in *chemistry* and *cookery*, applied to a bath of *hot* or *boiling water*. See BATH (in *chemistry*), BAIN-MARIE, &c.

BATH'ING (bāthe'-). See BATH.

BATH METAL. A species of brass having the following composition:—

1. *Zinc*, 3 parts; *copper*, 16 parts; melted together under charcoal.

2. *Fine brass*, 32 parts; *spelter*, 9 parts; See BRASS and ALLOYS.

BATH PIPE. See PIPE.

BATHS and **WASH'-HOUSES.** See BATH.

BATTER. Ingredients beaten together so as to form a semi-fluid mass. In *cookery*, a semi-fluid paste, which becomes hard in dressing, formed of flour, and milk or water, or a mixture of them, enriched and flavoured with eggs, butter, and (frequently) spices, currants, &c., at will. *Used* for frying vegetables, fillets, &c., and as a material for fritters and pancakes; also to form puddings, which are either baked alone, or under meat; and to
cover various articles during the
of cooking them. Miss Acton gives
lowing formulæ:—1. (For the Fry
Butter, 2 *oz.*; *boiling water*, (nearly)
mix, and stir in, gradually, of *cold*
¾ pint; when quite smooth, mix it by
very smoothly with fine dry *flour*, ½ lb.
ing (for fruit) a small pinch of *salt* (
for meat or vegetables); just before
in the *whites* of two *eggs* (or the
yelk of one—and fry until light and
In humble cookery, the eggs may be

2. (Por Puddings.) *Eggs* (yelk and
about 4 in no.; *flour*, ½ *lb.*; *milk*, q. s.

Obs. When *fruit*, &c., are added, the
must be made thicker than when
used, to prevent it sinking. When
ciently dressed it should cut smoothly
not stick to the knife. Eggs incr
firmness.

BATT'ERY. In *frictional electricity*, a
of Leyden jars so arranged as to ad
being charged and discharged together.
ELECTRICITY, &c.

Battery. In *electro-chemistry*, gal
&c., a pair, or series of pairs, of '
metallic plates, so arranged as to act in
producing an electrical current by
decomposition.

Baume Nerval. See OINTMENTS.

BAUMÉ (Baumé). See AREOMETER.

BAY. See SWEET BAY.

BDEL'LIUM (dĕl'-yŭm). The
name of two gum-resins:—

Bdellium Af'rican. *Syn.* BDELLIUM
CA'NUM, L. From the *heudola'tia* af
(Guillem.), a terebinthaceous tree, of

Bdellium In'dian. *Syn.* IN'DIAN
FALSE M.; BDELLIUM (of *Scripture*);
LIUM IN'DICUM, L. From *am'yris*
miph'ora (Roxb.), or *balsamoden'dron*
bur'gii, a terebinthaceous tree of India.

Prop., &c. Once considered slightly
struent; sometimes used as a pector
emmenagogue, and, externally, as a
and suppurative. It is now seldom
in this country.

BDELLOM'ETER (dĕl-). *Syn.* MECHA
LEECH; BDELLOM'ETRUM, L.; BDELLO
Fr. In *surgery*, a contrivance combi
principle of the cupping-glass, scari
and exhausting-syringe, in one small
ment.

BEAD (bēde). *Syn.* GLOB'ULUS,
&c., L.; GRAIN (de collier), &c., Fr.;
PERLE, &c., Ger. A little ball or
pierced for stringing; any very small
body‡; a bubble (‡ *or* tech.). A num
the first mounted on a thread or ribbo
a '*string of beads*' or 'chaplet.'

Materials, Manuf., &c. Beads are
formed of coral, gems, jet, pearls, por
rock-crystal, &c.; but much more freq
of white and coloured glass. The
which these last are produced is as follow
Glass tubes, appropriately ornamented

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[1] We have been for many years accustomed to take baths at 98° to 100° Fahr., in *all* weathers and seasons, even during our severest winters, and on leaving the bath have often been engaged, for hours, moving about in the open air, even until midnight, without 'catching cold,' or *the slightest inconvenience*. However, we do not recommend others to follow our practice without due care.

m, &c., are drawn out in various
s 100 to 200 feet in length.
re cut into two-feet lengths,
means of a steel knife, divided
ing, as nearly as possible, the
diameter. The resulting small
cylinders are next well stirred
e of sand and wood-ashes, in
nt the closure of the perfo-
ir adhering together during the
t of the process. They are
a revolving cylinder and gra-
until they become sufficiently
y are next sifted from the sand
d into sizes, first by means of
rwards by hand, and are lastly,
in weighed parcels or strung
children for the market.
cture of *coral*, *gems*, *jet*, and
ally, into *beads*, belongs to the

ly to form *necklaces*, *bracelets*,
icles of personal ornament; by
corate head-dresses, &c.; and for
poses. They are also employed
lic and Mohammedan nations
l purposes; and among savage
of money. They are still some-
s amulets. See BUGLE, CORAL,
, PEARLS, &c. (also *below*).
(bēdz). The *dried seeds* of
ri'us (Linn.) or Jamaica wild
ed and indigestible; accounted
ophthalmic by the vulgar.
ls. *Syn.* SPECIF'IC-GRAV'ITY
ll 'hollow spheres of glass' care-
d and numbered, in sets, intended
the hydrometer in determining
of fluids. They are used by drop-
into the liquid, in succession, until
d that exhibits indifference as to
nd will float under the surface at
at which it may be placed. The
this ball indicates, in thousandths,
t sought. They are particularly
in the hurry of the commercial
and have the advantage of being
to very small quantities of liquid;
m, of course, requires the same
and the results obtained the same
for deviations from the normal
, as with other instruments. See
ER, SPECIFIC GRAVITY, &c.
ng. BEAD'ING†. In *architecture*,
c, &c., any small moulding or con-
jection of which the vertical section
der.
Liquors). [Tech.] The small bright
bubbles, possessing some slight
permanence, which form on the sur-
coholic liquors of sufficient strength,
ated. See ALCOHOLOMETRY, PROOF,
elow).
NG. In the *liquor-trade*, anything
commercial spirits to cause *them to*
bead' *and to hang in pearly drops*
about the sides of the glass or bottle when poured out or shaken. The popular notion being that spirit is strong in proportion as it 'beads,' the object is to impart this property to weak spirit, so that it may appear, to the eye, to be of the proper strength. Various formulæ are current among the 'knowing ones' of the trade, most of which are unscientific, and many of them absolutely ineffective. The following are those now usually employed:—

Prep. 1. *Oil of sweet almonds* and *oil of vitriol*, of each, 1 *oz.*; rub them together in a glass, porcelain, or wedgewood-ware mortar or basin, adding, by degrees, of *crushed lump-sugar*, 2 *oz.*; continue the trituration until the mixture becomes pasty, then add, gradually, sufficient *rectified spirit* (strongest) to render the whole perfectly liquid; pour it into a quart bottle, and wash out the mortar twice, or oftener, with a little fresh spirit, until about 1 pint of *rectified spirit* has been employed, adding the washings each time to the bottle; lastly, cautiously shake the bottle (loosely corked) until admixture appears complete, and then set it aside in a cool place. For use, this compound (after agitation) is thrown into a two-gallon can or measure, which is then filled, from a tap, with the spirit to be 'beaded,' when the whole is thrown into the cask, and the measure washed out by refilling it and returning it two or three times; after which the contents of the cask are well 'rummaged up.' *Gin* is usually 'fined' a few hours afterwards; but it is better not to add the 'finings' for two or three days. *Other spirits* are allowed to become 'fine' by simple repose.—According to Mr. Hartley, and others, this quantity is "sufficient for 100 *galls.* of any spirit;" but it is more commonly used for a puncheon of 80 to 85 gallons.

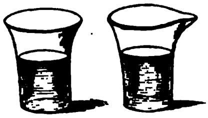
2. *Oil of vitriol*, 2 to 3 *oz.*; *rectified spirit* (strongest), 1 pint; cautiously agitate them together in a loosely corked quart bottle; in 2 or 3 hours add another pint of *rectified spirit*, and again agitate. It will be fit for *use* in a week; as before.

3. *Sulphuric ether*, ½ *lb.*; strongest *rectified spirit*, 1 quart; mix. May be used at once, as before; but if otherwise, should be kept, like the last, closely corked, and in a cool place.

4. *Soapwort-root* (saponaria officinalis), bruised or rasped small, 1 *lb.*; *rectified spirit* and *water*, of each, ½ *gal.*; macerate in a corked jar, with occasional agitation, for 8 or 10 days, strain with pressure, and, after a few days' repose, decant the clear portion. *Used* as before.

Obs. The above are not injurious when employed for 'beading,' since the quantity employed is much too small to injure the wholesomeness of the liquor. The fraud consists in their being used to disguise the presence of 10 to 12⅔ of water, which is thus sold at the price *of spirit. Beyond a certain degree of dilution they fail, however,* to produce the intended effect, the bubbles becoming 'soapy,' and without the requisite permanence. The addition of a little powdered *white sugar* (½ *oz.* to 1½ *oz.* per *gal.*) increases the efficacy of all of them. This may be dissolved in the water, *if* any is added at the time; but its effect on the hydrometer must be recollected. See ALCOHOLOMETRY, GIN, SPIRIT (Management of), &c.

BEAK'ER (bēke'-). *Syn.* BEAK'ER-GLASS. In *chemistry*, a beaked cup or glass, more or less of the tumbler-pattern, used to collect precipitates and to heat liquids in.



BEAL* (bēle). *Syn.* BOUTON, PUSTULE, Fr. A pimple or pustule; a small inflamed tumour.

BEAM (bēme). See BALANCE, SCALES, &c.

BEAM'-TREE. *Syn.* WHITE BEAM-TREE. The '*pyrus aria*' or wild pear. *Wood*, hard, compact, and tough; used for axle-trees, naves and cogs of wheels, &c.

BEAN (bēne). [Sax., Eng.] *Syn.* FA'BA, L.; FÈVE, Fr.; BOHNE, Ger. The general name of leguminous seeds, as also of the plants which produce them; appr., *fa'ba vulgār'is* (Mönch.; *vĭ"cia faba*, Linn.) or common GAR'DEN-BEAN,[1] *phase'olus multiflōr'us* (Willd.) or SCARLET-RUNN'ER,[2] and *ph. vulgaris* (Sav.), FRENCH BEAN, KID'NEY-B., or HAR'ICOT (-ko),[3] with their varieties, all of which are annuals cultivated in our gardens—the first, chiefly for its seeds—the others, both for their green pods and ripe seed. The name is also often popularly applied, as an appellative, to the fruit or seeds of other plants which, in size and appearance, resemble common beans, as noticed below.

Those principally cultivated in our gardens are the SMALL LIS'BON, SAND'WICH, SPAN'ISH, TOKAY', WIND'SOR, and MAZ'AGAN (from north Africa), with almost innumerable subvarieties of each. The exquisite perfume of beans in blossom is referred to by the poet Thomson:—

> "Arabia cannot boast a sweeter gale."

Preparations including their fragrant principle are highly prized in modern perfumery.

Qual., *&c.* The pods eaten in the green state, properly dressed, are regarded as antiscorbutic and wholesome; but are apt to produce flatulence, unless combined with spices. In the dried or ripe state they are rather difficult of digestion, and very apt to distend the stomach and intestines with wind. This objection does not exist, to the same extent, to their use in the form of flour or meal, amount of nutritious nitrogenous ma beans rather exceeds that in wheat, an pendently of a disposition to produce pation in some habits, and being rat easy of digestion, they must be co nearly as wholesome as that cereal. T don millers and bakers use immense qu of bean flour to adulterate their flo bread.

Green beans (pods or legumes) are by simply throwing them into boiling and simmering them until quite te 'pinch' of *salt of tartar*, or a little *salt*, being usually added to preserv green colour. Young and small ones ta 12 to 18 minutes—large or older ones, The first are merely 'topped and tail a knife, before being dressed; the oth quire also the side 'strings' to be dra and to be cut obliquely into pieces of a form, or else to be split lengthwise into and then divided once across. Old one boil tender. *Windsor beans*, and other ' beans,' take 15 to 30 minutes accor age. These last are sometimes skinne being dressed. All of them are co 'served up,' or eaten, with melted butt LEGUMINOSÆ, PULSE, &c. (also *below*).

Bean, Algaro'ba. See ALGAROBA.

Bean, Earth. American earth-nut.

Bean, French; *Horse-bean*; *Kid* &c. See BEAN (*antè*).

Composition. (Einhof.)

	Kidney beans.
Water	23·0
Albumenoid bodies . .	23·6
Starch, sugar, gum, &c.' .	44·7
Oil and fat . . .	0·7
Husk	7·0
Salts (ash) . . .	1·0
	100·

Bean, St. Ignatius's. The poisono the fruit of *Igna'tia amār'a* (Linn.; *Igna'tii*, Berg.), a tree indigenous to lippine Islands.—*Prop.*, *Uses*, *&c.* S those of nux vomica. Contains (which *see*).

BEAR (bare). *Syn.* UR'SUS, L. Fr.; BĂR, Ger.; BERA, Sax. In Cuvierian genus of the 'plantigrade of several species, found both in the New World. Those generally kno the name are omnivorous or fr The skin of the American black b *America'nus*, Pallas) was forme prized, and fetched an extravag The brown bear (*u. arctos*, Linn

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[1] Var. β, HORSE'-BEAN (*fa'ba equi'na*, *f. mi'nor*, &c., L.).

[2] Var. α, *phase'olus coccin'eus* (red-flowered):—β, *ph. albiflōr'us* (white-flowered).

[3] Var. α, *ph. unic'olor* (seeds of one colour):—β, *ph. fascia'tus* (seeds striped) or ZE'BRA-STRIPED BEAN:—γ, *ph. variega'tus* or SPECK'LED BEAN:—δ, *ph. na'nus* or *DWARF'-BEAN*.

kans, and some other northern
ny of the necessaries, and even
of life. The fat or grease
IE; AD'EPS UR'SI, L.) of all the
s has long been highly esteemed
the growth of the human hair;
without sufficient reason. The
ld under the name in England
lard or veal fat, or a mixture of
r scented and slightly coloured.
annually consumed in Great
xported, is estimated at many
larger quantity than all the
nt procurable in Europe would
ghtered and stripped of their

Y, **Bear's Bil'berry**, &c. See

ASE. See Bear (*above*), Hair
ARROW, POMMADES, &c.
rd). [Sax., Eng.] *Syn.* BAR'BA,
r.; BART, Ger., Dan.; BAARD,
r of the lips and chin; but *appr.*,
-that on each lip being distin-
let-nomenclature, by a separate
pular *botany* and *zoology*, any
pendage; the 'awn' of corn or
gills' or breathing organs of
her bivalves, &c.
. *Syn.* BARBA'TUS, L.; BARBU,
, Ger. In *anatomy*, *botany*, and
g a beard, or a beard-like ap-
ckly, barbed, jagged; awned.
bē'-) *Syn.* CAS'TOR, L.; CASTOR,
; BIBER, Ger. The *fi'ber cas'tor*
nimal belonging to the *rodentia*
d remarkable for the great in-
h it exercises in the construction
s or habitations. *Hab.* Europe
. Those of the former are bur-
e of the latter, builders. The
been employed in the manufac-
best quality of hats (BEAVER
fat was officinal in the Ph. L.
or (CASTO"REUM) is obtained from

NE (bēbe'-ĕr-in‡). $C_{19}H_{21}NO_3$.
Syn. BI'BIRINE (bē'-bĕr-ĭn); BE-
IRI'NA, &c., L. A peculiar al-
overed by Dr. Rodie, in the bark
the beeberu, bibiri, or green-heart
dra Rodiæ'i, Schomb.), of British
d since minutely examined by Mac-
lley, and by Von Planta.
. That of commerce, which gene-
ins some sipirine (—? altered be-
nd a little lime, is generally first
the form of sulphate, by a process
to that employed in the preparation
of quinine; and from this salt it
ated by the addition of ammonia or

n.) By precipitating the sulphate
, washing the precipitate with
water, and triturating it, whilst still
hydrated oxide of lead; next

drying the mixture by a gentle heat, exhausting the residuum with alcohol, distilling off the alcohol, and treating the last residuum with ether; the ethereal solution on evaporation leaves pure bebeerine, under the form of a white or yellowish-white, resinous-looking substance, which is pure white when powdered.

Prop., *&c.* Amorphous; uncrystallisable; non-volatile; bitter-tasted; inodorous; unalterable in the air; very slightly soluble in water; very soluble in alcohol; less so in ether; reaction, alkaline; when quite pure, melts at 355° Fahr., and on cooling forms a vitreous or semi-vitreous mass (Winckler); at a higher temperature it suffers decomposition; ignited on platinum-foil, it burns without leaving any carbonaceous residue; neutralises acids forming uncrystallisable salts, most of which are soluble in water.—*Prod.* From the *bark*, 1·5 to 1·75%; *dried seed*, 2·5% (nearly).

Use, *&c.* Bebeeru-bark has been proposed and occasionally employed as a substitute for cinchona bark, and bebeerine for quinine, in the usual cases; but whether as a tonic, febrifuge, or antiperiodic, they appear less powerful and certain than these last.—*Dose.* 2 to 12 grs. or more. (See *below*.)

Sul'phates of Bebeerine. Of these there are two, both of which are obtained in a similar manner to the Ph. E. formula for sulphate of quinine, and merely differ in the amount of acid finally left in combination with the alkali:—

1. **Sulphate.** *Syn.* NEU'TRAL SULPHATE OF BEBEERINE; BIBIRI'NÆ SUL'PHAS, &c., L. Easily soluble in water. Contains 86·4% of *bebeerine*, and 13·6% of *sulphuric acid.*

2. **Subsul'phate.** *Syn.* BAS'IC SULPHATE OF BEBEERINE, DISUL'PHATE OF B.; BIBERI'NÆ SUBSUL'PHAS, &c., L. Soluble in alcohol; sparingly soluble in water unless acidulated. Contains 90·8% of bebeerine, and 9·2% of sulphuric acid. This is the sulphate of bebeerine of commerce, and the one usually employed in medicine. It is generally met with in thin brownish-yellow scales, which are formed in a similar manner to those of ammonio-citrate of iron.—*Dose.* As a tonic, 1 to 3 grs.; as a febrifuge or antiperiodic, 5 to 20 grs.; in similar cases to those in which disulphate of quinine is employed.

BECH'AMEL (bĕsh'-ă-mĕl‡[1]). *Syn.* BÉCHAMEL, Fr. In *French cookery*, a fine white sauce, essentially consisting of concentrated veal gravy or veal consommé and cream, with or without flavouring. See SAUCES.

BE'CHIC* (-kĭk). *Syn.* BE'CHOUS†; BE'CHICUS (bĕk'-‡), L.; BÉCHIQUE, Fr.; HUSTEND, &c., Ger. In *medicine*, &c., of or for a cough; pectoral; also *subst.*, applied to remedies (BE'CHICS; BE'CHICA, L.) used to relieve *cough.*

BED. *[Eng., D., Sax.]* *Syn.* LIT, COUCHE,

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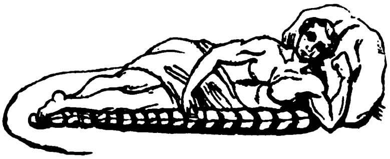
[1] Thus as English.

Fr.; BETT, &c., Ger.; CUBI'LE, LEC'TUS, LEC'TULUS, GRABA'TUS, &c., L. A couch; that in or on which we sleep; that on which anything is generated, deposited, or rests.

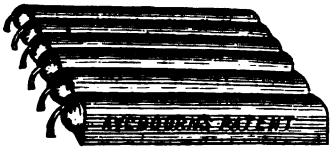
[On the connection of BEDS and BEDDING with comfort and health, see COTTON, DAMP, FEATHERS, LINEN, SLEEP, VENTILATION, VERMIN, &c.; also *below*.]

Bed, Air. *Beds, pillows, cushions,* &c., when properly constructed and inflated with *air*, are clean, luxurious, and healthy substitutes for those in common use. For this purpose the air-proof part should be formed of separate cells or tubes, arranged in ridges (see *engr.*), or in any similar manner to admit of free ventilation; and in the case of beds, or of cushions for the sick, two or three folds of flannel or blanket, or of any loose porous fabric, should be placed between them and the under sheet or the person of the sleeper or patient. Without this precaution, discomfort and restlessness, excessive warmth and perspiration, and even bed-sores, are apt to follow their use by invalids, when badly constructed. To obviate these objections to articles of this class commonly sold, a new one has been produced under the name of the 'INCOM'PARABLE BED (Aycbourn's Patent), which is thoroughly applicable to all purposes —domestic, medical, naval, or military—and superior to any feather, flock, or spring bed, however good or carefully made up. This bed consists of an outer case made of ordinary bed-ticking divided internally into numerous separate cells, into each of which is placed a *suitably constructed* bag, which may be either *wholly or partially* filled with *air* or *water*; the latter either hot or cold. (See
It is incapable of bursting, and is
able to lie on. It retains its shape,
time, trouble, and wear and tear
bestowed or produced by servant
tossing about one of down or f
easily washed and kept clean, allo
ventilation essential to health,
portable that it may be easily pa
carpet-bag. In almost an instant
converted into six, or more, separa
servers; and what is equally import
stand any climate. Hitherto the
beds and water-beds has been aln
sively confined to the upper an
classes, and to hospital practice
moderate prices[1] at which Aycbo
cushions, &c., are sold, place thes
and in many cases—absolute n
within the reach of the masses of t

1.



2.



(Opened.)

3.

(Closed.)

Bed, Water. *Water-beds, cushio*
chiefly employed for patients labou
bed-sores, paralysis, spinal affectic
who are the subjects of active sur
ment in which equable support fo
or a limb is absolutely necessary.
struction and use are similar to
viously noticed, except that, instea
inflated with air, they are filled
either warm or tepid. For the bed
for long-continued use generally
much inferior to air-beds. Se
(*above*).

Bed. *Syn.* STRA'TUM, L.; ST
Fr.; SCHICHT, &c., Ger. In *geolog*
layer, seam, or stratum, thick or th

Bed. In *horticulture*, a small p
usually raised a little above the g
face, in which flowers, or other
raised or grown.

BED'EGUAR (-e-gahr). *Syn.* B
-GAR), Fr. Sweet-briar sponge (w

BEE (bē). *Syn.* HIVE-BEE,
(hŭn'-), DOMES'TIC B.; A'PIS, L.
A. MELLIFIQUE, &c., Fr.; BIENE, H
&c., Ger. The *a'pis mellif'ica* (Li
E., & D.), one of the hymenop'tera
and most useful to man.

[Those desirous of studying the
economy of *bees* are referred to th
Huber and Latreille; and for the
ment to Mr. Cobbett's little book
ject.] See APIARY, APIS, HIV
WAX, &c.

BEE'-BREAD. The pollen of
lected by bees as food for their you

BEE'-GLUE. *Syn.* PROP'OLIS,
resinous matter with which bees
combs to the hives, and close up
the cells.

BEECH (bēche). *Syn.* BEECH'-
GUS, L.; HÊTRE, H. COMMUN, F
GEMEINE B., Ger. The *fa'gus sylvat'*
a magnificent English forest-tree,

---

[1] These are less than those of feather b
sponding dimensions.

which it is very tightly rolled up, secured with a cloth, and bound as closely as possible with broad tape. A piece of 8 *lbs.* will require about 5 hours' gentle boiling, and should be placed, in the same state, whilst still hot, under a heavy weight, or in a press, for a few hours. The ribs, or (better) the thinnest part of the flank, is generally selected. The last should be 'hung' in a damp place for a day or two before curing it.

2. (Mrs. Rundell.) From stewed shin of beef and ox-tail, re-stewed with a glassful each of wine and ketchup, and some of the old broth, and then poured into moulds. Sweet herbs, sliced eggs, and pickles, may be added at will.

Beef, Dutch, Hung Beef. The *round*, *rump*, *veiny-piece*, or *thick flank*, cured, for 10 or 12 days, with dry salt to which a little saltpetre and some sugar and black pepper has been added; and afterwards 'hung' for use. It eats well if boiled tender with greens or carrots. If to be grated or shred, as Dutch, and eaten as a relish on bread and butter, then cut a lean bit, boil it till extremely tender, and while hot put it under a press. When cold, fold it in a sheet of paper, and hang it in a very dry place. It will then keep two or three months.

Beef, Pott'ed. See POTTED MEATS, &c.

Beef, Spiced (spīst'). Salted beef when spices (usually *black-pepper* and *allspice*) have been added to the salt, &c., used in curing it. See COLLARED BEEF (*above*).

BEER (bēre). *Syn.* BIÈRE, Fr.; BIER, D., Ger.; BIRRA, It.; CEREVI"SIA (-vĭzh'-'ă), CERVI"SIA (Pliny), C. LUPULA'TA* (*i.e.* hopp'd *or* modern b.), VI'NUM ANGLIC'ANUM*, V. HORDEA'CEUM* (-sh'ŭm), ZY'THUM* (*or* -THUS*; ζύθος, Gr.), &c., L.; BERE, BEERE, Sax.; BIR, W. An aqueous infusion of malted grain which, after being boiled with hops, has undergone the vinous fermentation; malt-liquor. The word BEER is now the common generic term for all fermented malt-liquors, and, indeed, for all other beverages prepared by a process of brewing. Whenever the term is used in a special sense, it is with a descriptive prefix, as, for example, *spruce beer*, *ginger beer*, &c.

Hist. Ale and wine are fabled to have been invented by Bacchus; the former, in Egypt, where the soil and climate would not permit of the cultivation of the grape. Herodotus ascribes the origin of the art of brewing to Isis, the wife of Osiris, and notices *zythum* (ζῦθος), a beer obtained from barley. Malt-liquor was undoubtedly employed as a beverage in the fifth century before Christ; and, probably, very much earlier. Xenophon distinctly alludes to it in his famous retreat (B.C. 401). Aristotle speaks of 'beer-drunkenness;' and Theophrastus calls it 'barley-wine.' The Romans learned the art of brewing from the Egyptians, and gave the liquor thus made the appropriate name of *cerevisia* (quasi *Cererisia*), from its
being the product of corn, the gif
The most celebrated beer of ancient
the '*Pelu'sian pota'tion*,' so named a
at the mouth of the Nile where be
pared in great perfection. The u
was likewise known to the ancient
Germans, and probably also to
ancient nations inhabiting the temp
Pliny says "*Zythum* is made in E
and *ce"ria* in Spain, and many oth
beer) in Gaul." In our own count
early known and valued as a beve
art of its preparation appears to
obtained either from the Romans or
According to Verstegan, "This ex
healthsome liquor, *beere*, antiently
as of the Danes it yet is, was of th
invented and brought into use."
are mentioned in the laws of In
Wessex (A.D. 680). *Alebooths* were
by law, A.D. 728. By the beginn
13th century ale was drunk general
land. By a statute of James III, o
it was made a capital offence to mi
beer (A.D. 1482). In 1492, a li
granted to a brewer at Greenwic
50 tons of that "*ale*" called "*beer*"
the distinction between the two
being, that the latter was flavoured
wood or others bitters; whereas a
Ale was originally made from barle
yeast alone, and those who put i
else, were held to sophisticate the li
were introduced A.D. 1524; and t
modern, or hopp'd beer, may be tr

By statute of James I the "
"bere" was taxed, and "one q
best thereof," ordered to be sold
(A.D. 1610). *Alehouses* were first
1621, and during the reign of
were, together with all *malt-liq*
under the control of the Excise
By the Statutes 1 & 4 Will. IV
vious enactments respecting malt
their sale, were reduced to their p
Beer is now the common beve
European countries where the vi
subject of rustic husbandry.

Qual. Pure malt-liquor which
gone sufficient fermentation, is pe
taken in moderation, one of the
some beverages that can be d
is the most nutritious variety,
moderately mature, is the one b
to the debilitated and delicate;
porter, owing to being less rich i
and gummy matter, and from bei
astringent from high-dried o
malt being used in its preparation,
agrees better with bilious consti
the dyspeptic. Much, however,
acquired taste and habit. The n
some, and perhaps the least e
beverages obtained from malt, are t
as *East-India*, *Scotch*, and *Bav*
when honestly prepared and not

h the hop, as is, unfortunately, now
. A late writer has described good
tritious, from the sugar and muci-
it contains; exhilarating, from its
d strengthening and narcotic, from
Pereira says, "Beer is a thirst-
, refreshing, intoxicating, and slightly
beverage." Its effects, when taken
ly, or in excess, for the most part
hose of other intoxicating liquors—
isery, and crime; and these in direct
as it deviates from the true standard
and excellence.

he *numerous varieties* of malt-liquor
in commerce, may be resolved into
classes—ALE and PORTER. ALE of
is brewed chiefly from pale malt, and
lly of a light amber colour. PALE
anufactured from the finest and
lried malt, and the choicest hops,
in excess. MILD ALE differs from
being sweeter, stronger, and almost
the flavour of the hop. BITTER ALE
BEER has, as a rule, less body than
and is more highly hopped. TABLE
weak liquor commonly containing
four times the proportion of water
esent in ordinary beer or ale. POR-
from ale chiefly in its being artifi-
ured by the use of roasted malt, which
ts to it a peculiar bitter flavour. In
strength, it stands about midway
ight and strong ales, although fre-
rewed of a strength very slightly
of table beer. STOUT, BROWN
, are simply richer or stronger de-
of *porter*, and may be said to have
same relation to the higher qualities
le that porter holds with regard to
bitter beer. In London, PORTER is
; and, indeed, in all parts of the
the prevailing beverage of this kind
by the masses, of whatever class,
goes by the name of *beer*.

great classes of malt-liquor above
o, are, independently of mere differ-
strength, excellence, and commercial
actically subdivided into an almost
umber of varieties. Every county,
n, and almost every brewer, is dis-
by the production of a different-
beer, readily perceived, and highly
ed by their respective votaries. These
s may be traced to—variations in the
and quality of the materials employed
anufacture—the temperature of the
d for mashing—the duration of the
the temperature at which the fermen-
conducted, and the extent to which it
, together with numerous other cir-
es, which, though usually of an acci-
d uncertain character, are neverthe-
ient to affect the flavour and quality
ing. Among these, those depending
ndition of the building, *the locality*,
ating, the water, mismanagement, &c., are not the least important. In general, however, when the same quantity and quality of materials are employed, and the *same* time allowed for the maturation of the liquor, the chief causes of this diversity will be found to depend on the water used in the brewing, and the method followed in the preparation of the malt. Thus, ***Bavarian***, ***Scotch***, and ***Burton ales***, differ in style from other ales chiefly from being fermented at a lower temperature, and from the water employed in the brewing being that usually denominated 'hard;' whilst *porter* and *stout* differ from all these, because they are brewed from a mixture of pale and roasted malt. It is from causes like these, though apparently trivial, that the many varieties of malt liquor met with, at the present day, originate.

Materials, Manuf., &c. See MALT, HOPS, BREWING, &c.

Purity. The leading characteristics of good beer are transparency, a fine colour, an agreeable semi-vinous flavour, and the property of remaining for several hours exposed in a glass or cup without becoming 'flat' or insipid. If the materials used were good, if the brewing was skilfully conducted, if the liquor has been carefully stored in perfectly sweet casks or vessels, in a suitable cellar, for a sufficient time, and has not been tampered with, this will almost always be the case. Hence colour, transparency, and flavour, and the power of resisting exposure, are tests of the purity and quality of beer, which should not be lightly treated. There are none more simple and effectual; and, together with a good 'palate,' and a close observance of its effects on the head and on the stomach, will readily distinguish pure and wholesome beer from 'doctored' and inferior liquor. If, therefore, we find a sample of beer possessing the above qualities and in good condition, and on testing it for its alcohol and saccharine matter, find these substances in such quantities as fairly to represent the amount of malt which should have been used in the brewing of such a liquor, we may, in the absence of proof to the contrary, infer it to be pure; because the object for which adulteration is practised—the saving of malt and hops—did not exist in this case. To *demonstrate* the purity of beer, requires an elaborate and troublesome analysis, which can only be performed by those accustomed to chemical operations. Good and pure beer should contain nothing but what exists in the malt, the hops, and the water, from which it is brewed, or which is produced from them in the processes of 'mashing,' 'fermentation,' and 'maturation.'

Adulteration. Until the year 1862, nothing was allowed to enter into the composition of beer but malt and hops; and the Act 56 Geo. III, cap. 58, imposes a penalty of £200 on any "brewer, dealer, or retailer of beer," who "*shall receive*, or *have* in his possession, or *use*, or *mix with*, or put into any worts or beer, any molasses, honey, liquorice, vitriol, quassia, cocculus indicus, grains of paradise, Guinea-pepper, or opium, or any extract or preparation of these substances, for, or as a substitute for, malt or hops;" and a further penalty of £500 on any "druggist, or vendor of, or dealer in drugs, or chemist, or other person whatever," who shall "sell, send, or deliver to any licensed brewer," &c., any of the above materials. However, by the Act 25 Vic., cap. 22, s. 20, so much of the above is repealed as relates to hops. This Act provides that—

"On and after the 16th Sept., 1862, so much of an Act passed in the 56th year of the reign of King George the Third, cap. 58, and of an Act passed in the 7th and 8th years of the reign of King George the Fourth, cap. 52, and of any other Act relating to the revenue of excise, as imposes any excise penalty upon any brewer of, or dealer in, or retailer of beer, for receiving into, or having in his possession, or using or mixing with any worts or beer, any article for, or as a substitute for hops, or as prohibits the sale of any such article to the said persons, shall be, and is hereby repealed: provided always, that nothing herein contained shall be construed to extend to repeal any such penalty or prohibition so far as regards any article which may be used as a substitute for malt, notwithstanding that it may be also a substitute for hops."

Prior to this an Act (10 Vic., c. 5) had been passed allowing brewers to use sugar under certain restrictions.

As the law now stands, a brewer may use hops, quassia, wormwood, gentian, or any other simple bitter; but he is forbidden to use any substitute for malt, such as unmalted grain, sugar in a liquid state, molasses, or any substance which would give pungency or intoxicating properties to the beer, such as cocculus indicus, grains of paradise, tobacco, &c. It is a well-known and authenticated fact, that beer is commonly and sometimes dangerously adulterated. The cupidity of fraudulent brewers and publicans frequently induce them to introduce *other ingredients* than malt and bitters into their liquors, with a view of giving them a false appearance and strength. Thus, to give pungency—capsicum, grains of paradise, ginger, &c., have been added; to give intoxicating properties—opium, cocculus indicus, tobacco, &c.; as a substitute for malt—molasses, treacle, colouring, honey, &c.; to impart a false appearance of age—sulphuric acid, alum, green vitriol, glycerin, mustard, &c.; to remove acidity—pearlash, soda, chalk, &c.; and to impart a frothy head—alum, foots, table-salt, &c.

The publicans generally 'reduce' their strong beer with *water* (which they call 'liquor'), and add treacle, together with a mixture of *copperas*, *salt*, and *alum* (termed 'heading'), to make it bear a frothy head. The cheap beer sold in many of the low taverns of London is made by *dividing the contents* of two butts between butts, *filling them* up with water, and adding a bladder of porter-extract (tech termed 'P. E.') to each. This 'P. E.' is ture of powdered cocculus, Spanish mel, capsicum, &c., boiled up with water to the consistence of a thin then put into bullocks' bladders.

Exam., Tests, &c. The analysis of qualitative and quantitative, as already is a matter of considerable difficulty. therefore defer its consideration until to the article PORTER, as that beer, on account of its colour, is not one most difficult to examine, but also most frequently adulterated. See ALE, ING, HOPS, MALT, PORTER, &c.

Beer, Am'ber. *Syn.* AMBER. A formerly much drank in London, a mixture of 3 parts of *amber malt*, of *pale malt*, with about 6 *lbs.* of quarter. It was generally 'tapped' few days after it had done 'working,' chiefly used *mixed with bitters*, or 'PURL.'

Beer, Wheat'en, *Wheat'-malt Beer.* MUM.

⁂ Besides *malt liquor*, or BEER so-called, a somewhat similar beverage, of inferior quality, may be prepared vegetable substance rich in starch and as noticed in our article on BREWING. summer beverages also pass under the but in both the cases referred to, the the characteristic ingredient, or that vegetable employed, is always in *pea-shell beer*, *potato-beer*, Examples of some of these are given

Beer, Gin'ger. *Syn.* CEREVIS'IA ZINGIB'ERIS, C. ZINGIBERA'TA*, C. CUM ERE* (-ĕr-e), L. *Prep.* 1. *Lump-sugar*, good *unbleached Jamaica ginger* (well-1 *oz.*; *cream of tartar*, ¾ *oz.* (or ¼ *oz.*); 2 or 3 *lemons* (sliced); *boiling* 1 gal.; macerate, with frequent stirring, *covered vessel*, until *barely luke-warm*, add of *yeast*, 1½ or 2 *oz.* (about ¾ a glassful), and keep it in a moderately place, to excite a brisk fermentation; the day rack or decant the liquor, and through a jelly-bag or flannel; allow work for another day, or two, according weather; then skim it, again decant or and put it into bottles, the corks of should be 'wired' down.

2. Good *white sugar*, 18 to 24 *lbs.*; *juice* or *lime-juice*, 1 quart; finest *honey*, 1 or 2 *lbs.*; *bruised Jamaica* *lb.*; pure *soft water* (that has been and then allowed to settle), q. s. Boil ginger in 3 *galls.* of the water for half an then add the sugar, the juice, and the with sufficient water (see above) to whole measure 18¼ *galls.*, and strain the as before. When the liquor has become cold, add the *white of* 1 *egg*, and ½ *fl.* essence of lemon, and strongly agitate the or vessel for about half an hour.

according to the state of the
: it, and place the bottles on
a cellar, just as is done with
It will be ready for use in
, and will keep good for several
anted for immediate use, about
may be added, as in formula 1;
ll not keep so well, or be quite
; and free from deposit. The
d essence of lemon may be re-
by *cream of tartar* (in powder)
d, 4 *oz.*; and *lemons* (sliced) 1½
led with the sugar, &c.; but the
la is preferable.—*Prod.* 18 *galls.*
int bottles, or 30 *doz.* ordinary

ORANEOUS:—*a.* Into each bottle
ted essence of ginger, 1 drop;
or *capillaire*, ½ *oz.*; (or in lieu of
of ginger and *simple syrup*, of
t-spoonful;) and fill with *aerated*
t the 'bottling machine,' in the
Very superior.

ch bottle put *two* or *three lumps*
. them to the proper height with
hrow in (quickly) an *effervescing*
powder, and instantly cork the
ecure the cork with wire.

cooling and refreshing drink in
ber; and as a restorative after
g, fatigue, &c.

products of all the above for-
l-managed, are excellent; those
l 8s., of the very finest description,
r and superior to nine tenths of
r the best in the shops. They
led, by way of distinction, LIMO'-
GER-BEER, IMPERIAL G.-B., &c.
cles are made by omitting some of
nts, and particularly a portion of
The ginger-beer vended at 1*d*.
ttle, with that known as GINGER
IAL POP, &c., are generally made
ugar (½ to ¾ *lb.* to the *gal.*), and
ured with a little *coarse ginger*.
with 2 *lbs.* of *sugar* to the *gal.*
; 2 years, if not bottled for six
well-stored; and with 3 *lbs.* to the
years, when it forms a splendid
ER-CHAMPAGNE).

See SPRUCE BEER.

ce. *Syn.* CEREVIS'IA (-vĭzh'-)
ABIETI'NA, C. ABIET'ICA*, L.
er, 1 *lb.*; *essence of spruce*, ½ *oz.*;
r, 1 gal.; mix well, and when
add of *yeast*, ½ a wine-glassful;
day *bottle* like ginger-beer.

of spruce, ½ pint; *pimento* and
ed), of each, 5 *oz.*; *hops*, ¼ *lb.*;
.; boil the whole for 10 minutes,
oist sugar, 12 *lbs.* (or good *treacle*,
water, 11 galls.; mix well, and,
kewarm, further add of *yeast*, 1
he liquid has fermented *for about*
tle it.

fn. Diuretic and antiscorbutic

Regarded by some persons as an agreeable 'summer-drink,' and often found useful during long sea-voyages. When made with *lump-sugar* it is called WHITE SPRUCE-BEER; when with moist sugar or treacle, BROWN SPRUCE-BEER. An inferior sort is made by using less sugar, or more water. If made with 1½ to 1¾ *lb.* of *lump-sugar* per gal., and without yeast, in a similar manner to that described under GINGER-BEER (*No.* 2), it may be kept a twelvemonth, or longer, in a moderately cool place.

Beer, Sugar. *Syn.* CEREVIS'IA (-vĭzh'-) SAC'CHARI, L. From *moist sugar* (1 to 2 *lbs.* to the *gal.*) and a little *hops*; as treacle-beer.

Beer, Trea'cle (trē'kl-). *Syn.* CEREVIS'IA FÆ'CIS SAC'CHARI, &c., L. *Prep.* 1. From *treacle* or *molasses*, ¾ to 2 *lbs.* per gal. (according to the desired strength); *hops*, ½ to ¾ *oz.*; *yeast*, a table-spoonful; *water*, q. s.; treated as *below*.

2. *Hops*, 1½ *lb.*; *corianders*, 1 *oz.*; *capsicum-pods* (cut small), ½ *oz.*; *water*, 8 galls.; boil for 10 or 15 minutes, and strain the 'liquor' through a coarse sieve into a barrel containing *treacle*, 28 *lbs.*; then throw back the hops, &c., into the copper, and reboil them, for 10 minutes, with a second 8 galls. of *water*, which must be strained into the barrel, as before; next 'rummage' the whole well with a stout stick, add of cold water 21 galls. (sufficient to make the whole measure 37 galls.), and, after again mixing, stir in ½ a pint of *good fresh yeast*; lastly, let it remain for 24 hours in a moderately warm place, after which it may be put into the cellar, and in two or three days 'bottled,' or 'tapped' on 'draught.' In a week it will be fit to drink. Very superior. —*Prod.* 1 barrel, or 36 gallons. For a *stronger beer*, 36 *lbs.*, or even ½ *cwt.* of *treacle*, may be used. It will then keep good for a twelvemonth.

Obs. A wholesome drink; but one apt to prove laxative when taken in large quantities. See BREWING, GINGER BEER, POWDERS, &c.

BEERS. (In *pharmacy*.) *Syn.* CEREVIS'IÆ (-vĭzh'-e-ē) MEDICA'TÆ, L. The general *nature* and *preparation* of these articles have been already noticed.[1] They are little employed in this country. The *ingredients* should be so proportioned that from ¼ to ½ a pint may form the *proper dose*. The following are examples:—

Beer, Antiscorbu'tic. *Syn.* CEREVIS'IA ANTISCORBU'TICA, L.; SAPINETTE', Fr. *Prep.* 1. (P. Cod. 1839.) *Scurvy-grass* and *buds of the spruce-fir*, of each, 1 oz.; *horse-radish root*, 2 oz.; (all fresh, and bruised or sliced;) *new ale* or *beer*, 3½ pints (say, ½ *gal.*); macerate 4 days, press, and strain for use.

2. (Ph. Castr. Ruth. 1840.) *Horse-radish* (fresh), 4 lbs.; *juniper berries*, 3 lbs.; *root of calamus aromaticus* and *buds of pinus abies*, of each, 1 lb.; *ginger*, 1 oz.; *syrup* (of brown *sugar*), 6 *lbs.*; *beer*, 120 lbs. (say, 12 *galls.*); *macerate 4 days, or* until it ferments, then

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[1] See ALES (Medicated).

decant, strain, and add of *cream of tartar*, ½ lb.; *tincture of mustard*, (*flour of mustard* 2 oz., to *proof spirit* 12 oz.), 5 lbs. (say, ½ gal.). In scurvy, &c.

Beer, Cincho'na. *Syn.* A'GUE-BEER, BARK'-BEER; CEREVIS'IA CINCHO'NÆ, &c., L. *Prep.* 1. Bruised *cinchona-bark*, 1 oz.; *proof spirit* or *brandy*, 2 oz.; mix; the next day add of *new beer*, 1 quart, and in 3 days decant or filter.—*Dose.* 2 or 3 wine-glassfuls.

2. (Mutis.) *Cinchona*, 4 oz.; *sugar*, 2 lbs.; *boiling water*, 5 pints; when *lukewarm*, ferment with a little *yeast*, as for ginger-beer.—*Dose.* 1 or 2 wine-glassfuls.

3. (Ph. Ferrara.) *Bruised Peruvian bark*, 1½ oz.; *cinnamon*, 2 drs.; *nutmeg* (rasped), 7 drs.; *sugar*, 25 oz.; *yeast*, 2 oz.; *water*, 5 pints; mix, ferment, decant, and strain, as before.—*Dose.* 3 or 4 wine-glassfuls. They are all administered during the intermission of ague.

Beer, Pipsissewa. *Syn.* CEREVIS'IA CHIMAPH'-ILE, &c., L. *Prep.* (Dr. J. Parrish.) *Pipsissewa* (chimaphila umbellata), ½ lb.; *water*, 1 gal.; boil, strain, add of *sugar*, 1 lb.; *powdered ginger*, ½ oz.; *yeast*, q. s.; and ferment, strain, and bottle, as for ginger-beer. In scrofulous affections; especially of the joints. —*Dose.* Half a tumblerful. It is a favorite remedy with some American practitioners.

Beer, Sarsaparil'la. *Syn.* LIS'BON DI'ET-BEER, SPAN'ISH JARAVE; CEREVIS'IA SAR'ZÆ, C. SARSAPARIL'LÆ, INFU'SUM S. PARA'TUM FERMENTATIO'NE, &c., L. *Prep.* 1. *Compound extract of sarsaparilla*, 1½ oz.; *hot water*, 1 pint; dissolve, and when cold, add of good *pale* or *East-India ale*, 7 pints.

2. *Sarsaparilla* (sliced), 1 *lb.*; *guaiacum-bark* (bruised small), ¼ *lb.*; *guaiacum-wood*, (rasped), and *liquorice root* (sliced), of each, 2 *oz.*; *aniseed* (bruised), 1½ *oz.*; *mezereon root-bark*, 1 *oz.*; *cloves*, (cut small), ½ *oz.*; *moist sugar*, 3½ *lbs.*; *hot water* (not boiling), 9 quarts; mix in a clean stone jar, and keep it in a moderately warm room (shaking it twice or thrice daily) until active fermentation sets in, then let it repose for about a week, when it will be fit for use.

Obs. It is said to be superior to the other preparations of sarsaparilla as an alterative or purifier of the blood, particularly in old affections. That usually made has generally only one half the above quantity of sugar, for which treacle is often substituted; but in either case it will not keep well; whereas, with proper caution, the products of the above formulæ may be kept for one, or even two years. No yeast must be used.—*Dose.* A small tumblerful 3 or 4 times a day, or oftener.

Beer, Stomach'ic. *Syn.* MED'ICATED PURL; CEREVIS'IA STOMACH'ICA, L. *Prep.* (Dr. Quincy.) *Centaury-tops* and *Roman wormwood*, of each, 4 handfuls; *gentian root* (bruised), 2 *oz.*; *the yellow peels* of 6 *Seville oranges*; *Spanish angelica-root* and *Winter's lard*, *of each* (bruised), 1 *oz.*; *new ale*, or *beer*, 3 quarts (say, 1 *gal.*); digest for a as before. One or two wine-gl in the morning, and an hour before

Beer, Sulphu"ric Acid. *Syn.* S LEMONADE; CEREVISIA ACIDI SUL C. ANTICOL'ICA, L. *Prep.* 1. *Tr* or other *weak mild beer* or *ale*, to wh *concentrated sulphuric acid* has been the proportion of about 1 dr. to eve pints; the whole being well agitated and allowed a few hours to settle.

2. *Treacle*, 14 *lbs.*; *bruised gin* *coriander*, ¼ *oz.*; *capsicum* and *clov* ¼ *oz.*; *water*, 12½ galls.; *yeast*, 1 ceed as for ginger-beer, and whe mentation is nearly over, add of *oil* 1½ *oz.* (diluted with 8 times its weight and of *bicarbonate of soda*, 1½ *oz.* in a little water). It is fit to drink days.

Uses, &c. It is taken with great workers in lead, especially by those in white lead works; also in cases of poisoning by lead or its salts, &c. A ful twice or thrice daily. It is both and wholesome.

Beer, Tar. *Syn.* CEREVIS'IA PI'C LIQ'UIDÆ, L. *Prep.* (Duhamel.) pints; *tar*, 1 pint; *honey*, ½ pint; pints; mix, and gently simmer toge hours; when lukewarm add of *yeas* let it ferment for 36 hours, and str toral, anti-asthmatic, antiphthisic, & One wine-glassful before each meal, chial and chest diseases, and incip sumption. See BEERS (In Pharmacy

BEES'WING. The second or pe so much admired in *port* and a wines, and which forms in them kept for some time after the first or has formed. It consists of minute, floating particles or lamellæ of tar and freer from astringent matter, deposited in the first crust. Se WINES, &c.

BEET (bēte). *Syn.* BE'TA, L.; BETTE, Fr.; BEETE, MANGOLD, Ger.; BIETOLA, It. The common plants of the *genus* 'beta,' and th Chenopodeæ (DC.). There are said two distinct species cultivated—*bet* and *b. horten'sis*—each of which several varieties; those of the first, we have chiefly to consider, produci fleshy root (BEET'-ROOT, MAN'GOLD- BE'TÆ, L.; BETTERAVE, Fr.; ROT &c., Ger.), which is both sweet and those of the other, only succulent le varieties most useful, and now the m sively cultivated in England, are of tively recent introduction; field-*mangold-wurzel* of the Germans, ha only brought under the notice of o turists towards the end of the last c

Field Beet. See HYBRID BEET.

Hy'brid Beet. *Syn.* COMMON BE

erida, B. vulgar″is h., L.;
ine, 'Betterave c., Racine
R. de disette, &c., Fr.; Man-
gel, Mangel-w., &c., Ger. A
vulgaris (Linn.), and that usu-
by English farmers. Root, red
white inside; chiefly grown as
r cattle, being vastly superior
has been used, in Germany, as
r bread in times of scarcity.
l and eaten like spinach.
Syn. Cu′linary beet, Garden
sh, Beet′-rave, &c.; Be′ta
ulga″ris r., L.; Betterave,
ie rübe, &c., Ger. Root, ten-
rred, and of a rich red colour
d hence much used in salads,
ookery; also made into a con-
confection. The kinds most
lads are the small red and the
d varieties of Castelnaudari.
Syn. Be′ta marit′ima, L. Said
variety for dressing as spinach.
Syn. Be′ta al′ba, B. vul-
ci′cla, L.; Bette blanche,
Fr. A sub-variety of the red
white, and hence preferred for
; that with a purple crown being
sed.
preceding varieties of beet re-
ther in their general properties.
antiscorbutic, detergent, emol-
ritious; and their roots contain
gar, which, by proper treatment,
ined from them of excellent
grated root is sometimes used to
and foul ulcers. When sliced,
malt-kin, a very palatable beer
ed with it. The leaves of each
ressed and eaten like spinach.
the table, after being carefully
dressed whole—neither scraped
according to their size and age,
l to 4 hours' simmering or baking.
tly served in slices, cold, inter-
other winter salad-vegetables.
s, Cattle, Salads, Sugar, &c.

T. See Beet.

Blis′tering Beetle. See Cantharis.

BELL. *Syn.* Campa′na,[1] Campan′ula,[2] No′la*,[3] Tintinnab′ulum,[4] L.; Cloche, Clochette,[5] Grelot,[6] Fr.; Glocke, Schelle, &c., Ger.; Bell, Bella, Belle, Sax. A hollow vessel or body, usually of cast metal, with a wide cup-like mouth expanding outwards, so formed as to emit sound when suspended and struck with a hard substance. The word is also applied, either alone or in composition, to substances having the figure of a bell; as *bells* (of flowers), *bell-animal*, *b.-flower*, *b.-glass*, &c.

Form, *Manuf.*, *&c.* Bells of "the common and well-known shape, with a thick lip or sound-bow, are the most effective known instruments for producing a loud and musical sound, such as you want when you erect a large public clock, or put up a peal of church bells." "After trying a number of experiments, at Messrs. Warner's, I am quite satisfied that there is nothing to be gained by deviating materially from the established proportions of the best old bells."[7] This view is borne out by the researches of the Government commissioners[8] who visited the Paris Exhibition, who report, that among the 'founders' of France and Belgium, there are no traditions of the art, nor any discoveries or appliances of modern science, tending to the improvement of bells, or to provide efficient substitutes for them; nor is there any known improvement on the established mode and usual material (bronze or bell-metal) for casting them. Sir C. Barry, indeed, according to Mr. Dennison, "seemed rather impressed with the merits of cast-steel bells;" but both Prof. Wheatstone and Mr. Dennison differ from him in opinion. Undoubtedly some cast-steel bells, of small size, have been produced, capable of yielding sounds of extraordinary clearness and richness; but, in most cases, owing to the difficulty in giving the peculiar molecular condition to the metal essential to a high degree of sonorousness, their tones are comparatively harsh and disagreeable. Well-annealed glass offers a cheaper and better material than steel for large bells up to a certain size, whilst its tones are exquisite. As the depth of the tone of a bell depends chiefly upon the dimensions and sound of an Indian gong that may be easily held suspended by the hand, is always rich and usually as loud and deep as a bell of ordinary construction which it would take several men to lift. The Chinese often use bells made of porcelain. Small hand-bells for the toilet and boudoir are often made of silver, and then yield tones which are remarkably soft, clear, and pleasing. The tongue, clapper, or hammer, of bronze bells should be of iron; and steel bells, of bronze. Glass and porcelain bells require the striking part of the tongue to be of box-wood, the proper weight being given by a ball of iron cast on the rod immediately above it, and a similar one screwed on the end of the rod immediately below it. In all cases the hammer-head, preferably globular, should strike the bell near the verge, and should be free from projections or asperities.

The casting, &c., of bells is essentially similar to that of other articles in bronze, of corresponding size, and particularly of cannon. See Bell-metal, Bronze, &c.

BELL′-METAL. *Syn.* Æs campana″rum, L.; Métal de cloche, Fr.; Glockengut, Glockenspeise, Ger. The alloy, usually *bronze*, of which bells, &c., are made.

The composition of bell-metal varies considerably, as may be seen below:—

1. (Standard.) *Copper*, 78 parts; *tin*, 22 parts;[1] fused together and cast in the manner described under Bronze. The most sonorous of all the alloys of copper and tin. It is easily fusible, and has a fine compact grain, and a vitreous-conchoidal and yellowish-red fracture. According to Klaproth, the finest-toned Indian gongs have this composition.

2. (Founder's Standard.) *Copper*, 77 parts; *tin*, 21 parts; *antimony*, 2 parts.[2] Slightly paler and inferior to No. 1.

3. *Copper*, 80 parts; *tin*, 20 parts.[3] Very deep-toned and sonorous. *Used* in China and India for the larger gongs, tam-tams, &c.

4. *Copper*, 78 to 80 parts; *tin*, 22 to 20 parts. Usual composition of Chinese cymbals, tam-tams, &c.

5. *Copper*, 75 (= 3) parts; *tin*, 25 (= 1) parts.[4] Somewhat brittle. In fracture, semi-vitreous and bluish-red. Used for church and other large bells.

6. *Copper*, 80 parts; *tin*, 10¼ parts; *zinc*, 5½ parts; *lead*, 4¼ parts. English bell-metal, according to Thomson. Inferior to the last; the lead being apt to form isolated drops, to the injury of the uniformity of the alloy.

7. *Copper*, 68 parts; *tin*, 32 parts.[5] Brittle; fracture, conchoidal and ash-gray. Best proportions for house-bells, hand-bells, &c.; for which, however, 2 of *copper*, a
commonly substituted by the fo

8. *Copper*, 72 parts; *tin*, 26½
1½ part. Used by the Paris h
bells of small clocks or pendules.

9. *Copper*, 72 parts; *tin*, 26
2 parts. Used, like the last, f
bells.

10. *Copper*, 70 parts; *tin*, 26
2 parts. Used for the bells
watches.

Concluding remarks. Castings
are all more or less brittle; and,
have a colour varying from a dar
grayish-white, which is darkest
cupreous varieties, in which it tu
on the yellowish-red or bluish-red
the proportion of copper in t
deeper and graver the tone
formed of it. The addition of
zinc, causes them to give out
sharper. Bismuth and lead ar
added to modify the tone, whic
affects differently. The addition
and bismuth is frequently made b
to give a more crystalline grain
All these additions are, however,
the sonorousness of bells, and of
utility. Rapid refrigeration inc
norousness of all these alloys.
D'Arcet recommends the 'pieces'
to a cherry-red after they are ca
having been suddenly plunged in
to be submitted to well-regulated
skilful hammering, until they
proper form; after which they ar
heated and allowed to cool slowl
This is the method adopted by
with their gongs, &c., a casing
being employed by them to sup
tect the pieces during the expo
In a general way, however, bell
and completed by simple casting.
cessarily the case with all very
Where the quality of their tone
object sought after, the greates
be taken to use commercially pure
presence of a very little lead o
metal, greatly lessens the sonoro
alloy; whilst that of silver incre
last metal has been detected i
church bells remarkable for the
their tones—articles of silver
been cast into the crucibles of th
votive offerings, by the pious
former ages.

The specific gravity of a large
uniform throughout its whole s
can the *sp. gr.* from any given
its constituent metals be exact
owing to the many interfering c
The nearer this uniformity is a
in other words, chemical combin
plete, the more durable and fin
be the bell.

In general it is found neces

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[1] The resulting alloy probably contains 7 Cu + Sn.

[2] More antimony, or some other metal, is often added, as subsequently noticed; but always to the injury of the alloy as bell-metal.

[3] Equal to about 8 Cu + Sn. In some gongs the proportion of tin is so low as 22, or even 20 parts, to 100 parts of copper.

[4] Nearly equal to 6 Cu + Sn.

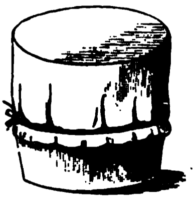
[5] *Equal to about 4 Cu + Sn.*

BENZO'IC ACID (-zō'-ĭk). $HC_7H_5O_2$. *Syn.* FLOWERS OF BENZOIN'; HY'DRATED BEN'-ZOYL; ACIDUM BENZO'ICUM (B.P.); ACIDE BENZOÏQUE, FLEURS DE BENJOIN, &c., Fr.; BENZOESÄURE, &c., Ger. A substance which is commonly stated to be the characteristic constituent of the true balsams. Pure oil of bitter-almonds suffers gradual conversion into this acid by exposure to the air.

Prep. The acid of commerce is principally obtained from gum-benzoin, either by sublimation (dry way), or by dissolving it out by means of an alkali, or an alkaline earth, in the form of a salt (moist way); but chiefly by the first method.

1. By SUBLIMATION:—

a. Good benzoin, crushed small or in the state of coarse powder, is placed in a cylindrical iron pot with a flat bottom, and from 8 to 9 inches in diameter, so as to form a layer of from 1 to 2 inches deep. The open end of the pot is next covered with a sheet of soft and loose blotting-paper,[1] which is attached to the rim with paste. A cone, cap, or cylinder, formed of strong thick paper (cartridge paper), open at its lower end, is then placed over the top of the pot, including the blotting-paper; and this is also attached with paste and string. The apparatus, thus prepared, is then placed on a sand bath,[2] and exposed for 4 to 6 hours to a gentle and uniform heat. It is next removed from the sand bath, and, when it has sufficiently cooled, inverted, and the string detached, when crystals of benzoic acid are found in the paper cone. If, owing to want of care in manipulating, the product is either coloured or empyreumatic, it must be enveloped in several folds of bibulous paper, then submitted to powerful pressure, and afterwards resublimed. The simple form of apparatus figured in the *engr.* answers well on the small scale, and is that recommended by Dr. Mohr.



b. (Ph. D. 1850.) The subliming pot is ordered to be of sheet-iron. It is to be fitted into a circular hole in a sheet of pasteboard, and a collar of tow interposed between it and the flange, so as to produce a nearly air-tight junction. The paper receiver or cap is to be cylindrical, open at one end and about 18 inches high, with a diameter at least twice that of the pot; and it is to be secured, in an inverted position, on the pasteboard, and fastened to it by slips of paper and flour-paste. A couple of inches of the pot is to be passed through a corresponding hole in a plate of sheet-tin, which is to be kept from contact with the pasteboard by the interposition of a few corks; and a heat[3] only just
melt the benzoin is to be applied
six hours.

c. (Process adopted at *Apothe*
London.) The best gum-benzoin
an *iron pot*, set in brickwork ove
small fire-place (or flue),[4] and co
by a conical metal neck, with a
(technically termed a 'house') line
blotting-paper, as a receiver for
A piece of fine muslin, or of bibul
interposed between the top of th
pot and the receiver, to prevent t
falling back into the former. The
is conducted rather rapidly, and t
denses in beautiful white, soft, fle
which are at once ready for the m
the process is conducted more slow
duct is proportionately scaly.

Obs. Good samples of benzoin y
to 12%, or even 12½ %, of 'flowers'
the first sublimation.' This, after b
in blotting-paper and again sub
8½ to 10% of nearly pure benzoic
loss arising from a second sublima
so great, that the utmost care sho
to avoid its necessity.

2. In the MOIST WAY:—

a. (Ph. D. 1826; Scheele's Proc
parts of *benzoin* and *hydrate of*
powder, are intimately mixed to
boiled for about an hour, with
water; the liquor, after filtration, i
to ⅛th, and the lime saturated
chloric acid; the benzoic acid cry
as the liquor cools, and is then ei
with very cold water, and dried
heat, or it is dried and sublimed in
already explained. The product
mation is extremely white and pu

Obs. An economical and produc
but, to ensure success, a perfect mi
dry ingredients must be first mad
wise the benzoin runs into a solid
boiling water, and the operation
"1 lb. of (gum) benjamin yields
scr. of flowers." (Gray.)[5]

b. (Process of Stoltze.) The be
solved in 3 times its weight of alc
lution introduced into a retort, a
of carbonate of soda in weak spiri
is gradually added, until all the f
sent is neutralised; water, equal t
the weight of the benzoin empl
poured in, and the alcohol remove
tion. The floating resin is now
the residual liquid, and washed
water, and the washings added to
of the retort, which will deposi
benzoate of soda on cooling, a
subsequent evaporation. From

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[1] Felt—Liebig.

[2] *On an iron plate on which sand has been spread*—*Ph. Bor.*

[3] That of a gas-flame is recommended.
small gas-jets answers better.

[4] A pan with a steam-jacket answers w
manageable.

[5] A quantity which, in our own experi
never able to obtain.

obtained by saturating the alkali
(as the hydrochloric), and by
imation of the crude precipitated

thods :—
hipparic acid is very gently
ut 15 minutes, in nitric acid[1]
water is then added, and the
d to cool and crystallise. The
lected on a filter, washed with a
water, dried by pressure in bi-
and lastly, purified by sublima-

urine of horses, cows, and other
animals, in a similar way to that
aric acid is obtained, only allow-
to acquire a slight degree of
e evaporation, which last should
; a heat slightly under that of
he crude acid thus obtained is
viously directed.
quantities of benzoic acid are
tained in this way on the Con-
wing to the process being clum-
d, it is generally of inferior
ence unsaleable. It may, how-
l purification, be rendered quite
obtained from gum benzoin.[2]
een obtained by sublimation ben-
rms soft, light, feathery, white,
ls, which are transparent or semi-
with more or less of a mother-of-
; when by slowly cooling its
tion, or by precipitation from a
benzoate, it forms either thin plates
a dazzling white crystalline pow-
odorous when cold,[3] but acquires
nic odour when gently warmed;
t 212° Fahr., and begins to sub-
t a temperature a little above it,
boil until heated to about 460°;
bright yellow flame; is very so-
ol, dissolves in about 200 parts
r, and about 25 parts of boiling
s the action of ordinary nitric
n boiling; and forms salts (BEN'-
the bases.—Sp. gr. 0·667. Its
is very suffocating and irritat-
sity of 4·27. Added to fat and
es it either prevents, or greatly
cession of rancidity.
It may be recognised—1. By its
erties (appearance, fusibility, vo-
, &c.) already enumerated :—2.
solubility in solutions of the
by being precipitated from these
e addition of one of the stronger
e form of a dazzling white pow-
only sparingly soluble in cold water :—3. By its neutral salts with the alkalies, or its neutral solution in an alkali, giving a bulky, flesh-coloured precipitate with perchloride of iron, which is insoluble in water :—4. By its solution not being precipitated by acetate of lead until after neutralisation with a fixed alkali, when the acetate produces a white, flocculent precipitate :—5. By a mixture of alcohol, ammonia, and solution of chloride of barium, neither disturbing a solution of the free acid, nor that of one of its salts with the alkalies.

It is chemically distinguished from cinnamic acid by not yielding essential oil of almonds when it is distilled with oxidising agents, as chromic acid or a mixture of bichromate of potassium and sulphuric acid; and from succinic acid, by its different deportment with sesquichloride of iron (*Test* 3, antè), and with a mixture of alcohol, ammonia, and solution of chloride of barium (*T.* 5, antè).

Estim.—1. By weighing it as benzoic acid, obtained either by precipitation, or by very careful sublimation in a glass apparatus :—2. By neutralising its alcoholic or aqueous solution, by the usual method of acidimetry :—3. By precipitating its neutral solution with acetate of lead, or with sesquichloride of iron, and weighing the carefully washed and dried precipitate either as benzoate of lead, or as ferric benzoate.

Pur. &c. White crystalline silky plates and needles, having an aromatic odour. Solubility in cold water, 1 in 300; in boiling water, 1 in 12; in spirit, 1 in 4. Also soluble in caustic alkalies and lime. Borax considerably increases its solubility in water; 1 of benzoic acid and 1 of borax are soluble in 100 of water. It sublimes without residue when heated. It is sometimes met with adulterated with hippuric acid, which may be easily detected by its altered form, by its diminishing solubility in cold water, and by its exhaling an odour of tonquin-beans, and afterwards of hydrocyanic acid, when sublimed. The presence of succinic acid may be readily detected by its greatly increased solubility in cold water; that of sugar, not only by its increased solubility, and partial volatility, but also by the odour of caramel being evolved on the application of sufficient heat, and the residuum being black and carbonaceous; that of camphor, by its peculiar odour when gently heated. Spermaceti, specially prepared for the purpose, is also an occasional adulterant, easily detected by its insolubility and other well-known properties. All these substances either destroy or lack the proper crystalline form of benzoic acid, which is one of the best proofs of its purity. They also greatly increase its sp. gr.

Uses, &c. Its chief use in *medicine* is as a stimulant and expectorant. It is an ingredient in the compound tincture of camphor (*paregoric elixir*) of the pharmacopœia.—*Dose.* 10 to 30 *grs.*, dissolved in water by the

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acid as well as sulphuric acid also con-
into benzoic acid; as does likewise a
f heat. See HIPPURIC ACID.
ory of sal-ammoniac, near Magdeburgh,
is able to supply flowers of benjamin by

shops usually smells slightly of benzoin,
ence of a trace of volatile oil.

aid of a little ammonia or potassa; in old coughs, &c.

BENZO′IC AL′COHOL. A peculiar oily fluid, discovered by M. Cannizzaro, and obtained by the action of an alcoholic solution of potassa on pure oil of bitter almonds.

BENZOIN′, B. P. (-zoyn′; -zō′-ĭn). *Syn.* GUM-BENZOIN*‡, BEN′JAMIN†*, GUM-B.†*; BENZÖI′NUM, L., B. P.; BENJOIN, Fr.; BENZÖE, Ger. The balsamic resin exuded from incisions made in the stem of the *styrax benzoin*, a native of Sumatra, Java, Borneo, Laos, and Siam. Several varieties of benzoin are in the market; two only, however, are chiefly used in medicine, one in agglutinated masses, the other (from Siam), in tears, being the purer and having the stronger odour.

Prop., &c. Odour agreeable, and somewhat like that of vanilla, but more balsamic; fracture conchoidal; lustre greasy; sp. gr. 1·063 to 1·092. It fuses at a gentle heat, and exhales white fumes, which, on condensation, are found to be benzoic acid contaminated with a little volatile oil. Alcohol dissolves the larger portion of it, ether much less, and the volatile and fixed oils only a little. It contains from 9% to 18, or (occasionally) nearly 20%, of benzoic acid, according to the quality. It burns with an agreeable odour. The resin and its alcoholic solution strike a bright red colour with oil of vitriol, and a green colour with chloride of iron.

Uses, &c. It is chiefly employed in perfumery, and as an ingredient in incense, fumigating pastilles, &c.; also in court-plaster, in certain cosmetics, and to scent the varnish used for snuff-boxes, walking-sticks, &c. As a medicine, its general effects resemble those of the other true balsams, and of benzoic acid. —*Dose.* 5 or 6 to 20, or even 30 grs., in powder, and usually in combination with some other remedy; chiefly in chronic pulmonary and bronchial affections, when occurring in torpid habits, and unaccompanied by inflammatory symptoms or gastric irritation. Also as a fumigation in the same diseases, hooping-cough, &c. Like benzoic acid, it is used to prevent rancidity in ointments, pommades, and other fatty preparations.

BENZOINUM. See BENZOIN.

BEN′ZOL (-zōle). C_6H_6. [*benz*(oin)-*oleum.*] *Syn.* BEN′ZENE*, BEN′ZĪNE, BEN′ZŌLE*, HYDRĪDE OF PHE′NȲL*, PHE′NE†, &c.; BENZO′LEUM, L.; BENZINE, Fr.; BENZÖL, Ger. A peculiar ethereal hydrocarbon discovered, by Faraday, among the products of the destructive distillation of whale oil and other organic substances (A.D. 1825); and subsequently shown, by Mitscherlich, to form the principal ingredient in the distillate procured by the action of heat on a mixture of benzoic acid and hydrate of lime. In 1849, Mr. C. B. Mansfield[1] discovered its presence in coal-tar naphtha, from which the benzol of com
now chiefly, if not wholly, obtained.

Prep. 1. PURE:—*a.* A mixture
acid, 1 part; *fresh-slaked lime*, 3 part
mitted, in a coated glass or earthenw
to a heat slowly raised to redness;
portion of the resulting distillate i
parated from the water, and carefully
with the proper precautions, at a te
not exceeding 190° Fahr. The p
usually stated to be pure benzol; bu
this it may be submitted to one ref
and rectification, in the manner a
temperature noticed below.

b. From good commercial benzol
with 1-4th or 1-5th of its weight
trated sulphuric acid, and, after r
decantation, rectified at a temperat
195° Fahr.; the resulting distillate i
to a temperature below[2] 32° Fahr.
mass of crystals that form are thr
funnel, kept at the same temperatur
after which they are pressed betwe
bibulous paper,[3] and then allowed
by simple exposure, in a close ves
ordinary temperature of the atmosp
product, after rectification at a te
not exceeding 190°, is nearly pure b
may be rendered absolutely pure by
the refrigeration a second and a t
followed by a final rectification at
Fahr.

2. COMMERCIAL:—By submitting
tar naphtha to distillation, either
after it has been agitated with a li
vitriol, and decanted, care being take
temperature does not exceed 200° F

Prop. Pure benzol is a clear, colou
mobile liquid, having a strong, char
and rather agreeable ethereal odour.
tral to test-paper; exceedingly vola
temperatures; insoluble in water;
with alcohol and with ether; high
mable; burns with a brilliant flame
clouds of smoke, which rapidly con
fall as a shower of fine sooty, car
matter; boils at 176° Fahr.;[4] solidifie
a snowy white camphor-like mass, or,
slowly refrigerated, to beautiful t
cruciform leaflets, which aggregat
into forms resembling fern-fronds;
40·1° Fahr.; and when solidifies burn
phor, without previous fusion. Sp.

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[1] This unfortunate chemist lost his life (Feb. 25, 1855), *in consequence of being severely burned whilst experimenting on benzol.*

[2] Preferably considerably below. If the
not rich in benzol, a temperature so low a
even 4-5°, Fahr. may be necessary or, at al
vantageous.

[3] Filtration under pressure is thought by
to be preferable. For this purpose a '*Beart*
(or a similarly constructed apparatus), w
ployed by Mansfield, and is recommend
Muspratt.

[4] Fownes, Mansfield, Muspratt, and oth
Mitscherlich; 187°—Mr. C. G. Williams (in
of A., M., & M.," 5th ed.). See *Note* 5 (bel

[5] Williams, Ure, Muspratt; ·885—Fownes,
The different sp. gr. and boiling-points
benzol, by authors, can only be accounted fo
of different degrees of purity having

pour, 2·770.[1] It is unaffected
ry hydrated acids, and has no
alkaline metals. Highly con-
ic acid readily dissolves it, and
ion nitrobenzol is precipitated
of water. Its vapour is dan-
mmable, and, when mixed with
ly explosive. Its solvent power
a numerous list of substances.
nzol has a less agreeable odour,
quently a slight colour, with
ions of the properties just enu-
ding on the relative amount of
ained in it.
should be colourless, without
r litmus or turmeric paper, and
g-point, sp. gr.,[2] &c., already
A few drops thrown on a slip
piece of white paper, should
tirely evaporate by simple expo-
without leaving a stain behind,
y disagreeable or foreign odour:
with a little sulphuric acid
olour it:—4. It should not per-
weight or volume by agitation
ld water.
From the physical and other
eady enumerated:—2. By con-
aniline and then testing it ac-
or this purpose a little of it is
concentrated nitric acid, and the
ns formed is precipitated by the
ter. The fluid is then agitated
o dissolve out the nitrobenzol,
lting ethereal solution is mixed
l bulk of alcohol and hydrochloric
little granulated zinc at once
rogen is evolved, and by its action
mpound is converted into aniline.
is next alkalised with potassa in
the alkaline fluid agitated with
ethereal solution, on evaporation,
sidue (aniline), which, after the
a little water, may be tested with
s of solution of chloride of lime,
racteristic purple colour will be de-
vided the original liquor was ben-
tained it. In this way very minute
nzol may be detected.
e. In its impure or commercial
ly as a solvent for gutta percha, and
er; but it leaves the first in a
able state, and the latter glutinous
unless heat is applied to it for some
as a solvent in the manufacture of
as a diluent, in lieu of oil of turpen-
d-paints, as a material for the production of artificial light, &c. &c. In the pure, or nearly pure form, it is largely employed in the laboratory and in chemical analysis as a solvent of many resins,[3] mastic, wax, camphor, fat, the fixed and essential oils, sulphur, phosphorus, iodine, several of the alkaloids,[4] &c. &c. Under the name of BENZINE and BENZINE-COLLAS it has been recently extensively vended for the removal of spots of grease, paint, &c., from woven fabrics, which it does most readily and completely, without detriment to the material. As a source of artificial light it has been the subject of innumerable applications and patents. It may be burned in a 'wickless' lamp, provided a proper cap-burner be employed. Alcohol or pyroxilic spirit containing 1-3rd, or even 1-4th of it, burns with a rich white flame. Air driven through it becomes sufficiently inflammable to serve as illuminating gas; whilst ordinary coal-gas by merely passing over it yields a flame of greatly increased brilliancy; but in all these applications the greatest possible care is necessary to prevent accidents.[5] See NAPHTHA (Coal-tar).

BENZOYL. C_7H_5O. The radical of an extensive series of compounds, of which the hydride, C_7H_5OH (essential oil of bitter almonds), and benzoic acid, $HC_7H_5O_2$, are the most important members.

Benzoyl, Hy'dride of. C_7H_5OH. *Syn.* ESSENCE OF BITTER ALMONDS, ESSENTIAL OIL OF BITTER ALMONDS, VOLATILE OIL OF BITTER ALMONDS. *Prep.* 1. The crude oil of bitter almonds is agitated with a moderately dilute solution of protochloride of iron which has been previously mixed with fresh hydrate of lime in excess, and the whole, after having been placed in a retort connected with a suitable receiver, is subjected to distillation. The hydride passes over mixed with water, from which it is easily separated after repose. By subjecting it to a second agitation and distillation with a fresh mixture of the protochloride and hydrate, and, after careful separation from the water which distils over with it, allowing it to remain for some hours in contact with a few fragments of fused chloride of calcium, to free it from all traces of adhering water, the product will be nearly chemically pure, provided the whole process has been conducted with as little access of air as possible.

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[1] numbers given in the text are those now
ted; but we are not prepared to say, that
nitely settled. On the contrary, we think it
that further investigations may show that
ly greater levity of the benzole obtained from
arise from the presence of some other hydro-
h has hitherto escaped detection.
nly, ·720.

[2] a less sp. gr. than ·850, *it is probably adul-
the naphtha obtained from the Torbane-hill
mineral, of which the sp. gr. is only ·750.*

[3] Anime and copal are scarcely affected by it in the fluid state, but readily dissolve in its vapour at the point of condensation.

[4] Particularly quinine, which it dissolves readily, but not cinchonine. Hence it is invaluable for the separation of them. It may be economically and conveniently substituted for ether in the preparation of many alkaloids, with the advantage of being applicable in many cases in which ether cannot be employed.

[5] Workmen constantly exposed to the vapour of benzol are very subject to nervous irritability, and, where the apartment is ill-ventilated, even fits of nervous prostration and trembling, of a truly alarming character. In two or three cases which we have seen, the symptoms, to the inexperienced eye, *closely resembled those occasionally resulting from the long-continued use of very minute doses of strychnia, or of the alcoholic extract of nux vomica.*

2. (Liebig.) Agitate the crude oil of bitter almonds with mercuric oxide, in slight excess, and, after a few days' contact, rectify the oil from a little fresh oxide of mercury. The product is quite pure, when the process is properly managed. The bicyanide of mercury thus formed may be either employed as such, or reconverted into oxide of mercury and hydrocyanic acid.

Prop., &c. A rather thin, colourless liquid, of great refractive power, and characteristic and agreeable odour; soluble in 35 parts of water; miscible in all proportions with alcohol and ether; it boils at 356° Fahr.; on exposure to the air it rapidly absorbs oxygen, and becomes converted into a mass of crystallised benzoic acid; heated with solid hydrate of potassa, hydrogen is evolved, and benzoate of potassium formed; with the alkaline bisulphites it forms beautiful crystalline compounds. Its flame, and that of its vapour, is bright but very smoky. Sp. gr. 1·043. It differs from the crude or common oil of bitter almonds chiefly in the absence of hydrocyanic acid, and consequently in not being poisonous. It has hence been proposed as a substitute for the crude oil as a flavouring ingredient in cookery, confectionery, liqueurs, &c.; but is unfitted for the purpose owing to the rapid deterioration it suffers unless it be kept absolutely excluded from the air.

Formiate of Hydride of Benzoyle. See FORMOBENZOIC ACID.

BER'BERINE (-een).[1] $C_{20}H_{17}NO_4$. [Eng., Fr.] *Syn.* BAR'BERINE*, BER'BERITE* (of Thomson); BERBERI'NA, L. A substance discovered by Buchner and Herberger in the *root* of the common barberry shrub (*ber'beris vulgār'is*, Linn.); and subsequently, by Bödecker, in calumba-root; and more recently, by Mr. Perrins, in the calumba-wood (*menispermum fenestratum*) of Ceylon, which contains a considerable quantity of it.

Prep. 1. A soft watery extract of the root, or of the wood, is digested in rectified spirit, with trituration, as long as anything is taken up; the resulting tincture, after repose, is filtered, and the alcohol gradually distilled off until the residuum has the consistence of a thin syrup. The crystals which form as the liquid cools are drained in a funnel, washed with a few drops of ice-cold water, pressed dry in bibulous paper, and then purified by solution and crystallisation, first in rectified spirit, and next in distilled water.

2. By digesting the root, or the wood, (coarsely powdered,) in rectified spirit, and then proceeding as before.

Prop. Berberine may be classed with the azotised colouring substances; or, from its composition and its possessing feeble basic properties, with the alkaloids. It crystallises in fine needles, or in stellated prisms, which are yellow, odourless, very bitter-tasted, neutral to test-paper, and contain 12 equiv. of At 212° Fahr. it acquires a red colour; covers its normal yellow on cooling. A higher temperature decomposes it, yel pours being evolved. It is freely so boiling water, and in alcohol, from which solutions it may be readily ob crystals. It requires 500 parts of 60° to dissolve it, and very much lower temperatures. Its solutions are that in alcohol appears green, by reflect The concentrated mineral acids de Its salts are more or less soluble.

Uses, &c. Chiefly in medicine, in cases to those in which the use of c root is indicated. It has been highly mended in dyspepsia and heartburn, turbed action of the liver, and, combin iron (lactate, phosphate, or hyposulph chlorosis, anæmia, &c. According to M it is an effectual remedy for the lourless diarrhœa, and the derangement urinary secretion, which commonly cholera.—*Dose.* 3 to 10 grs.; in larger proves laxative. See CALUMBA, &c.

BERG'AMOT. *Syn.* BERGAMO'T BERGAMOTE, Fr.; BERGAMOTTE, Fr. The bergamot-lemon, or fruit of *cit ga'mia*; also sometimes, colloquially, grant oil obtained from its rind. Se (Volatile).

BER'RY (bĕr'-re). *Syn.* BAC'CA (pl. -sē), L.; BAIE, Fr.; BEERE, Ger. Any succulent or pulpy fruit containing naked seeds or granules. In *botany*, hiscent pericarp or seed-vessel, pulpy, celled, and many-seeded; the seeds being and for a time connected by a slender brane, from which they become deta maturity, and then remain dispersed the pulp. It is distinguished by its &c., into several varieties.

The leading berries employed in economy and the arts are noticed in alphabetical places (which *see*).

BER'YL (bĕr'-rĭl). *Syn.* AQUA (-rēne'); A'QUA-MARI'NA, BERYL'L AIGUE-MARINE, BÉRIL, Fr.; BERYL Ger.; SMARAGD, It. A beautiful which, in its richer forms, is class the gems. It is usually of a green various shades, passing into honey-yel sky-blue. It is allied in composition emerald; but occurs in much larger than that gem, and owes its colour to iron, instead of oxide of chromium. ing to Gmelin its composition is—Silica alumina, 17·6%; glucina, 13·4%; red iron, ·24%. Other (previous) authoriti that it contains fully 14% of glucina lime, and 1% of oxide of iron.

The finest beryls come from Dauria frontiers of China, from Siberia, an Brazil. Some of gigantic size have found in the U. S., at Ackworth and tham, New Hampshire, and at Ro

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[1] This substance must not be confounded with BERBERINE or BIBERINE (which *see*).

f these measured 32 × 22 × 15
reighed 2900 *lbs.;* another, 12
ıches, and weighed 1076 *lbs.*

Saxony beryl, chrysolite or
rge, coloured fluor-spar, and
rystals of phosphate of iron, are
up by the lapidaries and passed
r false beryls, emeralds, topazes,
s, PASTES, &c.

. See GLUCINA.

M°. See GLUCINIUM.

'tl). [Eng., Ger.] *Syn.* BE'TLE,
B. PEPPER-TREE; BÉTEL, Fr.;
ER, &c., Ger.; PI'PER BE'TEL
VICA BETLE (Miquel), L. A
ıt of the *nat. ord.* Piperaceæ,
dia and the East. Its leaves, which
mble those of the citron, are bitter,
ıic, stimulant, and sialogogue.
ommon masticatory in the East,
ewed in the same way as tobacco
eans and Americans, but much
ly, being regarded by the Malays,
c., as an absolute necessary of
commonly formed by dividing
nto four or six equal parts or
which is rolled up, with a little
sirih or *leaf* of the *piper-betel*,[3]
stitutes a 'quid' ready for use.

Betel, in those accustomed to its
s a species of pleasing excitement
ion, stimulates the action of the
ds, stomach, and kidneys, corrects
iminishes cutaneous perspiration,
cessive discharges, increases the
physical exertion and endurance,
the effects of climate, and appears
a general tonic on the system. It
e teeth, and tinges the saliva, as
e mouth and lips of a bright red
a those unhabituated to its use, it
diness, astringes and excoriates the
l fauces, and temporarily deadens the
ste. The Indians conceive that it
and fastens the teeth, cleanses and
s the gums, sweetens the breath,
mouth, assists respiration, and acts
al aphrodisiac on both sexes. Peron
t he preserved his health during a
very trying voyage by the habitual
tel, whilst his companions, who did
, died mostly of dysentery.[4]

L-NUT. *Syn.* ARE'CA-NUT; NUX
A'ECHU, N.-BE'TEL, &c., L. The *seed*
techu-palm (*are'ca cat'echu*, Linn.),
of the husk or fibrous pericarp. The
ıt (ARECA-NUT of commerce) is about
f a small egg; the husked nut is of
of a large nutmeg. The whole fruit is remarkable for its narcotic or intoxicating power. It has, however, been thought doubtful whether its intoxicating effect is not owing to the piper-leaf in which it is wrapped when eaten (chewed), rather than to any special property of its own. See ARECA CATECHU.

BET'ULINE (-ū-lĭn; bē'-tū). [Eng., Fr.] *Syn.* BETULI'NA, L. A crystalline substance obtained from the bark of the white birch (*bé'tŭla al'ba*, Linn.).

BE'ZOAR (-zōre). [Eng., L. indecl.; *prim.* Pers.[5]] *Syn.* BE'ZOAR-STONE; BEZOĀR'DUS, LA'PIS BEZOĀR'DICUS, &c., L.; BÉZOAR, BÉZOARD, Fr.; BEZOARSTEIN, Ger. The name of preternatural concretions found in the stomach, intestines, &c., of certain animals, and formerly supposed to possess the most extraordinary antidotal power and medicinal virtues. So far, indeed, did this belief extend, that other substances regarded as antidotes were called BEZOAR'DICS†, or otherwise named after them; whilst the adj. BEZOAR'DIC† (bĕz-) and BEZOAR'TICAL† (*bézoardique*, Fr.; *bezoar'dicus*, L.), came to be synonymous with antidotal. Certain bezoars were once valued at even ten times their weight in gold. They were not only taken internally, but also worn as amulets, They have, however, long since fallen into disuse in this country.

Among the leading bezoars of old medicine are—

Bezoar, Ger'man. *Syn.* BE'ZOĀR GERMAN'ICUM, B. CAPRI'NUM, L. From the Alpine goat.

Bezoar, Hu'man. *Syn.* B. HOM'INIS, L. Falsely stated to be found occasionally in man.

Bezoar, Microcos'mic. *Syn.* B. MICROCOS'MICUM, L. Human urinary calculi.

Bezoar, Mon'key. *Syn.* B. SIM'IÆ, LA'PIS S., L. From certain species of ape or monkey, obtained by giving an emetic.

Bezoar, Occiden'tal. *Syn.* WEST'ERN, B.; B. OCCIDENTA'LE, L. Found in the fourth stomach of the chamois or wild goat of Peru, &c.; or, according to others, of a species of antelope.

Bezoar, Orien'tal. *Syn.* EAST'ERN B.; B. ORIENTA'LE, LAPIS B. ORIENTA'LIS, L. From the fourth stomach of *ca'pra æga'grus*, a species of goat inhabiting the mountains of Persia, &c.

Bezoar, Ox. *Syn.* B. BOVI'NUM, L. From the ox, and other bovine animals.

Bezoar, Por'cupine. *Syn.* B. HYS'TRICIS, B. HYS'TRICUS, LA'PIS H., L. PORCI'NUS, &c., L. Said to be found in the gall-bladder of the Indian porcupine. Chiefly from Malacca. Has an intensely bitter taste, which it imparts to water.

Bezoar, West'ern. See OCCIDENTAL BEZOAR (*antè*).

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y cases suitable pieces of the whole fruit, in-
husk, are used; and in others, only the husk
there being different strengths and qualities of
ployed.

ade by burning shells.

me times, the leaf of *chavica siriboa* (*Miq.*),
some similar properties, is employed.
[illegible] Australes."

[5] Some authorities derive this word from *badzahr* or *pazahar*, Persian compounds implying 'antidote to poison;' others, from *pasang*, or *pasahr*, the name of the goat in Persia. *Mayne's notation—bez'oar*, is unusual; and *several of his analogues*, synonymes, &c., are incorrectly *given* (? *misprinted*).

Of the preceding, those from the stomach of ruminants vary in size from that of a bean to that of a hen's egg, and have a composition and appearance closely imitated by the following formula, the product of which is commonly sold for them:—

Bezoar, Facti″tious. *Prep.* From pipe-clay, or clay and chalk, equal parts, made into a stiff paste with ox-gall; a little hair or wool being added, and the resulting mixture pressed by the hands into small masses of a flattened spheroidal or egg-like form. These give a yellow tint to paper rubbed with chalk, and a green one to quick-lime, which tests are used for genuine bezoars. Like the latter, they are antacid or absorbent, which is probably the only virtue they possess.

Amongst '*chemical bezoars*' now obsolete, even on the Continent, were—

Bezoar, Ar'gentine†; B. LUNA″RE, L. Made by distilling butter of antimony with a solution of nitrate of silver. Once highly esteemed in epilepsy and head diseases.

Bezoar, Min'eral; B. MINERA'LE, L. Powder of algaroth deflagrated with nitre in a red hot crucible, and then well washed with water. Once used as a diaphoretic. Other similar preparations were B. JOVIA'LE (from *tin*), and B. MARTIALE (from *iron*).

Bezoar, Sat'urnine, B. OF LEAD; B. SATUR'NI, L. Made by distilling a mixture of oxide of lead, butter of antimony, and nitric acid. Once highly esteemed in diseases of the spleen.

BHAURTA. In Indian cookery, a dish made of mashed potatoes and onions, strongly spiced with capsicum, and sometimes also with curry-powder, shaped in a mould, and then slightly baked.

BIBAS'IC. *Syn.* BIBAS'ICUS, L.; BIBASIQUE, Fr. In *chemistry*, having two bases, or two atoms of the base or basic radical in its composition. See ACID, NOMENCLATURE, SALT, &c.

BIB'ERON (bĭb'-rōng). [Fr.] A sucking-bottle or 'artificial mother.' See BOTTLES.

BI'BIRINE (bē'-). See BEBEERINE.

BIB'ULOUS (-ū-). *Syn.* BIB'ŪLUS, L.; SPONGIEUX, Fr. Absorptive; spongy.

BICAR'BONATE. A salt in which only half the hydrogen in (hypothetical) carbonic acid (H_2CO_3) is replaced by a metal, *e. g.* bicarbonate of sodium, $NaHCO_3$.

BICE (bīse). *Syn.* BLUE BICE. See BLUE PIGMENTS.

Bice, Green. See GREEN PIGMENTS.

BI'DERY (bē'-). *Syn.* VI'DRY. An alloy of which the chief seat of the manufacture is the city of Bider', near Hyderabad, India. It was first brought under the notice of the British public at the International Exhibition of 1851, where many articles made of it were greatly admired for the elegance of their forms, and the gracefulness of their engraved and *enchased patterns*.

Prep. 1. *Zinc*, 31 parts; *copper* and *lead*,
of each, 2 parts; melted together,
usual precautions, under a mixture of
bees'-wax, to prevent oxidation.[1]

2. (Dr. Heyne.) *Copper*, 8 parts
parts; *tin*, 1 part; melted together,
For use, the resulting alloy is rem
to every 3 parts of it, 16 parts of
added.

Prop., &c. Colour, between that
and zinc; does not corrode by expo
or damp; yields little to the hamme
only be broken by extreme violence.
sesses a convenient degree of fusibil
that of zinc and tin, but much lower
of copper. For the turner it is usual
moulds of baked clay; but otherwise
of iron or other hard metal. The
black colour, which the finished art
sess, is imparted by dipping them in
tion of sal-ammoniac, saltpetre, sea-
blue vitriol. See BRASS, BRONZE,
&c.

BIDET' (bĭd-ĕt'; -ā'—Fr.). An
bedroom furniture conveniently fo
laving the lower part of the body.
the value of its use as an instrumen
sonal cleanliness and health, it offer
means of medicating the parts, ofte
serviceable in piles, prolapsus, affectio
scrotum and prostate gland, strangury,
suppressed or difficult menstruation,
ABLUTION, BATHS, &c.

BIEN'NIAL (bī-ĕn'-y'ăl). *Syn.*
L.; BIENNAL, BISANNUEL, DE DE
Fr.; ZWEIJÄHRIG, Ger. Occurring
or lasting, two years. In *botany* an
ing, applied to plants that do not
flowers and seed until the second year
of their growth, and which then die;
biennial plant.

The existence of the biennials, lik
the annuals, may be prolonged by art
many of them, by carefully remo
flowers ere the seed-vessels begin to f
be made to bloom a second season,
for several seasons following, like p
See ANNUALS, FLOWERS, PLANTS, &c

BIFF'IN. A baked apple, flat
pressure.

Prep. The *apples* are placed in a
6 or 7 times in succession, and flatte
time by gentle pressure, gradually a
soon as they are soft enough to bear
which they are taken out, and as soo
put on clean dishes or glass plates.
or tart variety of apples is the best fo
If the process be well managed, th
ance of the prepared fruit is very ric
flavour delicious.

BIL'BERRY. The whortleberry.

Bilberry, Bear's. Uva ursi.

BILE. *Syn.* BI'LIS,[2] CHO'LE,[3]

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[1] These are very nearly the proportions
Hamilton says he saw used in India.

[2] Properly, the 'gall' after it leaves the 'g
—a sense retained in its English analogue.

[4] Strictly, the gall-bladder with the gall.

alle, Fr.; Galle, &c., Ger. A
creted by the liver, from venous
t flowing from the intestines, and
rgitating into the gall-bladder.
on is of a very complex character;
n the animal economy appear to
ate the chyle from the chyme,
he digestion and assimilation of
bstances, and to assist in exciting
ic action of the intestines. The
to owe their colour chiefly to the
ile; as, without it, they possess a
ay colour. Several of the sub-
h enter into its composition, or
rmed from those which do so, are
here, under their respective names.
detection, and uses in the arts, are
Gall.

nimals). See Gall.

iousness. Under these terms are
cluded all those slight affections
ich, usually accompanied with de-
f the head and bowels, apparently
n excess of bile. Persons subject
f this description should be particu-
l to avoid excess in both eating and
nd should more especially shun
es of food, and those liquors, which,
ience, they find are apt to disagree
A mutton chop, slightly under-
n excellent article for the breakfast,
ch, of bilious patients; and good
tton, either broiled or roasted, so
y be retained, is better for dinner
y dishes apparently more delicate.
h fresh game and venison, form a
ty from which to choose a bill of
r beer and porter should be particu-
ed, as well as boiled meat, stews,
y or rich puddings, much butter
most articles of pastry, as they are
stible, and, by overtasking the
the stomach, very apt to derange
cheese,[1] salads (particularly cu-
ver-ripe or unripe fruit, new bread
bbages and green vegetables, and
as, beans, nuts, almonds, and the
o objectionable for parties with
achs or a bilious tendency. The
by such persons should be per-
rom alum, and preferably prepared
taining the whole of the bran in
ld be two days, or at the least,
The quantity of animal food
ept for the laborious, should be
rom 6 or 8 to 12 *oz.*; and warm
kinds, except moderately strong
e, should be taken as seldom as
, in general, avoided altogether.
and chocolate prove injurious to
and bilious. Out-door exercise
f fresh air are essential to the
h persons. Those who indulge in
re never attacked with affections
unless it be *after gluttonising or* heavy drinking. Above all things heavy and late suppers should be abandoned; indeed, the better plan is to take nothing more than a hard biscuit, or dry crust, after tea.

In general, attacks of bile may be prevented by the exercise of moderate judgment and temperance in living; and, in those hitherto subject to them, by the occasional use of an aloetic, mercurial, or saline aperient; and they may be generally rapidly removed by an emetic, followed by a dose of castor oil, Epsom salts, or Seidlitz powder. A tumbler of pure cold water taken on retiring to rest, and another (or even two) on rising in the morning, will often remove both the tendency and the fit, when all the usual remedies have failed. See Abernethy Medicines, Antibilious, Dyspepsia, Stomach Affections, &c.

BIL'IARY AFFECTIONS (-yăr-e). See Bile (*antè*), Calculi, Jaundice, Liver, &c.

BI'LINE (-līn). *Syn.* Bili'na, L. This name has been loosely applied to two substances:—1. Bile, or pure bile, freed from the mucus of the gall-bladder, and gently evaporated to dryness. A gummy pale yellow mass, white when powdered:—2. Tauro-cholalic or choleic acid. See Gall, &c.

BIL'IOUS (-yŭs). *Syn.* Bilio'sus, L.; Bilieux, Fr.; Gallig, Gallicht, &c., Ger. Pertaining to, caused by, full of, or having excess of bile. See Bile, Biliousness.

BILIPH'EINE (-e-ĭn). Cholepyrrhine.

BILIV'ERDINE (-dĭn). A green colouring matter, identical with chlorophyll, found in bile, and in the green dejections of children.

BILL OF FARE. In *cookery, domestic economy*, &c., a list of things ready dressed or prepared for the table (carte, c. d'un restaurant, menu, &c., Fr.); also a list of articles of food in season. For *Tables* of the latter, see Food.

BI'NARY. *Syn.* Bina''rius, L.; Binaire, Fr. Consisting of two parts. In *chemistry*, compounded of two elements, or of two bodies performing the function of elements.

BINOC'ULAR (-ū-). Having two eyes. In *optics*, of or with two eyes, as *binoc'ular vĭ''sion;* or formed with two eye-pieces or tubes, so as to be used with two eyes, as a *b. mi'croscope, b. tel'escope*, &c.

BIRCH. *Syn.* Be'tula, L.; Bouleau, Fr.; Birke, Ger. The common name of trees of the genus *be'tula;* appr., *b. al'ba* (Linn.), or white birch; also its wood. See Betuline, and *below*.

Black Birch. *Syn.* Cher'ry b., Sweet b., Mount'ain mahog'any; Betulen'ta, L. A forest tree of No. America. Wood, used for cabinet-work: bark yields a volatile oil similar in odour and taste to that of gaultheria; juice, obtained by tapping, saccharine, and yields birch-sugar.

White Birch. *Syn.* Birch, (*or*) Common b.; Be'tula, L. A tree found in the woods *of England. Wood, neither very hard nor durable; leaves formerly* used in itch and dropsy;

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is absolute poison to the bilious.

bark febrifuge, yields a pyroligneous oil by distillation. See OILS (and *above*).

BIRD.[1] [Eng., Sax.] *Syn.* A'VIS, L.; OISEAU, Fr.; VOGEL, Ger. Any fowl, or animal of the feathered kind. In fashionable and gourmandic cant, *appr.* a partridge. See BIRDS (*below*).

BIRD'LIME. *Syn.* VIS'CUS, L.; GLU, Fr.; VOGELLEIM, Ger. *Prep.* The middle bark of the holly (gathered in June or July), is boiled for 6 to 8 hours in water, or until it becomes quite soft and tender; the water is then drained off, and it is placed in a heap, in a pit underground (commonly on layers of fern), and covered with stones. Here it is left to ferment for 2 or 3 weeks, and watered, if necessary, until it assumes a mucilaginous state. It is next pounded in a mortar until reduced to a uniform mass, which is then well kneaded with the hands, in running water, until all the refuse matter is worked out. It is, lastly, placed in an earthen vessel, and covered with a little water; in which state it may be preserved from season to season. In about a week it is fit for use.

Prop. Greenish coloured; very gluey, stringy, and tenacious; when air-dried, brittle and pulverisable, but capable of gradually assuming its previous viscosity when moistened.

Uses. To cover twigs to catch birds, and other small animals. It is said to be discutient, but is now never employed in medicine.

Obs. Birdlime may also be made from misletoe-berries, the young shoots of the elder, the bark of the wayfaring-tree, and some other vegetables, by a similar process to that above described. Should any of it stick to the hands, it may be removed by means of a little oil of turpentine.

A kind of FACTITIOUS BIRDLIME is made by boiling linseed oil either with, or without, a little yellow resin, until it forms a viscid, stringy paste when cold. This is chiefly used, spread on paper or cloth, to catch insects. See FLY-PAPERS, &c.

BIRDS. *Syn.* A'VES, L. Birds, besides their value as food, play an important part in the economy of organic nature, and particularly in that of the vegetable kingdom. They are the best friends of the agriculturist and the gardener; and their presence, in numbers, appears essential to keep down the innumerable races of insects that prey upon our cereals, fruits, and culinary vegetables. M. Florent Prevost, who has for fifty years presided over the Natural History Museum of Paris, and who has, like the ancient Roman augurs, examined the entrails and stomach of fowls with scientific curiosity, avers, as the result of his long experience, that birds, of
whatever sort, are an unmitigate
the farmer, and that the detritus
particles found by inspection of t
hecatombs, which, by the assist
Royal Forest Rangers, he has sac
altar of utility, show an immense p
of insect corpuscula in their dige
whilst the traces of cereal or ot
products are infinitesimal in co
is found that even sparrows, rook
three of the feathered tribe the
cuted by the farmer—are, in
faithful and vigilant conservators
and crops. In one of the sma
Germany, where, owing to pu
being given to their destroyers, t
of sparrows were exterminated
failed to such an alarming ext
became necessary to offer large
the re-introduction of these use
other parts. In some of the agr
tricts of France, where the d
small birds has been carried on w
activity for years, insects have so
multiplied as to attack every
around them. Even the forest-
many cases, denuded of leaves
are rapidly perishing. Venomo
caterpillars, previously scarcely k
to entomologists, have now beco
and cases of children losing the
attacks of them whilst bird-n
recently been published in the
In our own country, the extensio
clubs—associations disgraceful t
intelligence of the nineteent
threatens similar results. Alre
dener finds his fruit-crops less
year; and that many of them, p
the smaller and sweeter fruits, ha
precarious, that they now sca
cultivation. In our own n
where small birds have for som
destroyed by bushels at a time,
impossible to raise a currant,
cherry, or plum; whilst seedling
culinary vegetables often entir
on the first night after being pl
so completely deprived of the suc
of their leaves and stems, that t
skeleton of network, in a few day
dies. But this is not all—the co
diurnals bring us continual repo
grain-crops in the neighbourho
these bird-clubs have existed f
of time, and that even on la
remarkable for its fertility.[3] Did
only on the benighted beings w
cast back the blessings of an all-
ing Providence, it would be a jus
but, unfortunately, it affects the
and threatens, ere long, unless

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[1] *Properly*, a 'chicken' or 'young flying animal.'—It is remarkable, as observed by Webster, that a nation should lay aside the proper generic name of flying animals—'fowl' (*fugel*, *fugl*, Sax.; *vogel*, Ger., Dut.; *fugl*, Dan.; *fogel*, Sw.; from the root of the Lat., *fugio*, *fugo*), and *substitute the name of the* young of those animals, as the *generic term.*

[2] A striking fatal case of this descriptio
"Times" of June 12, 1862.

[3] See the "Times" and other leadin
1862.

prove a national calamity. The
remedy for the evil, at present,
n of information tending to show
er and the gardener, in destroy-
s, destroy their best friends.
er information respecting *birds*,
ARY, BIRD (*antè*), GAME, GER-
NESTS (Edible), POULTRY, PU-
TAXIDERMY, TRUSSING, &c.]

. [Fr.] A small biscuit. In *cook-*
ecies of confection made of eggs,
ade, and sugar, variously com-
flavoured according to the taste
er.

-kit). [Eng., Fr.] *Syn.* BUCCEL-
NIS BIS COC'TUS, L.; SWIEBACK,
TO, It.; BIZCOCHO, Sp. *Literally*,
;' *appr.*, a well-known variety of
leavened bread, made in thin flat
se prepared for seamen (SEA'-BIS-
TAIN'S B.[1]) are composed of flour
nly. When made of fine flour,
caraway seeds are added, they are
called AB'ERNE'THY BISCUITS.
its generally contain a little sugar
to which almonds, caraways, mace,
on, and other articles, technically
ourings,' are frequently added.

n the small scale, biscuits are made
g the flour and water into a dough
mmon process of hand-kneading,
ly assisted with a lever, as in making
bread. The dough is then rolled
t, and cut into pieces of the desired
form. These, after being stamped, are
o the heat of a moderately quick oven,
few minutes (12 to 18, according to
) are sufficient to bake them.

large scale, the whole manual pro-
preparing the dough to the point
the newly made biscuits are ready
g, is now generally performed by
. The articles so prepared are
known in trade as 'MACHINE-MADE
and are not only much cheaper,
ly equal quality to those 'made by
the bakehouses of her Majesty's
Yards at Deptford, Gosport, and
the ingenious machinery invented
T. Grant, is employed. These
nts are said to be capable of pro-
ually above 8000 tons of sea-bis-
saving of upwards of 12,000*l.* a
the cost that would have been
r the purpose on the old system.
atter, it is stated, that wages, and
ear of utensils, cost about 1*s.* 6*d.*
f biscuit; whilst under the new
cost is only 5*d.*

vance of biscuit to each seaman in
avy is 1 *lb.* per day; or, on the
biscuits.

Fan'cy. The varieties of these are
merable. In a printed list now before us, we observe the names of upwards of one hundred different kinds. These are produced by varying the number and proportions of the ingredients used in their composition, and the form and size in which they are turned out of hand. They are further modified by the relative heat of the oven, as well as the length of time they are allowed to remain in it. It would, therefore, be waste of space to give particular directions for the preparation of each. The proportions of butter and sugar, or either of them, may be from 1 *oz.* and upwards, to flour, 1 *lb.*; according to the degree of richness desired. In a few cases, milk, or eggs, or both, are introduced. The 'flavourings' embrace a wide range of substances—bitter-almonds, caraways, cassia, cinnamon, ginger, mace, nutmeg, lemon, orange-peel, orange-flower water, essence of peach kernels, vanilla, &c. &c.; many of which give their name to the biscuit.—AR'ROW-ROOT BISCUITS are usually made of equal parts of arrow-root and flour; MEAT'-BISCUITS, from about 1 part of lean meat (minced small and pulped) beaten to a dough with about 2 parts of flour, and a little seasoning, no water being added;[2] SODA BISCUITS, by adding 1 to 2 *drs.* of carbonate of soda to each *lb.* of flour. In most other cases, the mere inspection of the biscuit will convey to the experienced biscuit-baker and cook sufficient information to enable him to produce an exactly similar one, or at least a very close imitation. The richest kind of SPONGE-BISCUITS, as we are informed, are made as follows:—Add the whites and yelks of 12 eggs, previously well beaten, to 1¼ *lb.* of finely powdered sugar, and whisk it until it rises in bubbles, then add 1 *lb.* of the finest pastry-flour, and the grated rind of 2 lemons. Put it into 'shapes,' sift a little sugar over them, and bake them in buttered tin moulds, in a moderately quick oven, for nearly half an hour.[3]

BISCUITS, DEV'ILED, in *cookery*, are captain's biscuits (or any similar kind) buttered on both sides, peppered well, and then covered on one side with a slice of good cheese formed into a paste with made mustard; the whole being seasoned with a little cayenne pepper, is, lastly, grilled. Chopped anchovies, or essence of anchovies, is a good addition.

BISMUTH. Bi. BISMUTH, ETAIN DE GLACE, Fr.; BISMUTH, WISMUTH, W.-METALL, Ger. One of the metals.

Sources. Bismuth occurs in the mineral kingdom in the metallic state (NA'TIVE BISMUTH), and in combination with sulphur (BIS'MUTHINE), and with oxygen (B. O'CHRE, &c.). That of commerce is mostly imported from Saxony, where it is chiefly obtained from native bismuth, by the simple process of eliquation. The ore, sorted by hand from the gangue, and broken into pieces of about the size of nuts, is introduced into the ignited iron pipes of the furnace (see *engr.*), until these latter are filled to about one half their diameter, and to three fourths of their length. From these the liquefied metal is allowed to flow into iron pans containing some coal-dust, and from these into a trough of water, in which it is granulated and cooled. It is subsequently remelted and cast into moulds so as to form 'bars' varying in weight from 25 to 56 *lbs.* each. In this state it usually contains a small admixture of arsenic, iron, lead, and sulphur; from the first of which it may be freed by exposure, for some time, under charcoal, at a dull red heat. It is best obtained in a pure condition by heating to redness, in a covered crucible, a mixture of oxide, or subnitrate of bismuth, with half its weight of charcoal.

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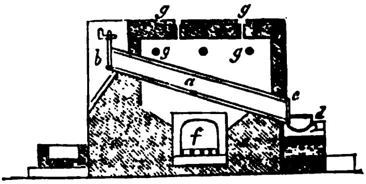
[1] 's biscuit differs from a common 'sea-
made of finer flour.

[2] For the MEAT-BISCUITS used in the navy, and by travellers, see MEAT.

[3] A few *fancy biscuits* will be found noticed in their alphabetical places. See CRACKNELS, MACAROONS, &c.



Bismuth-furnace in Section.

(*a.*) Eliquation-tube.[1]
(*b.*) End at which it is charged.
(*c.*) End from which the metal flows.
(*d.*) Receiving-pan.
(*e.*) Water-trough.
(*f.*) Grate, &c.[2]
(*g.g.*) Draught-holes.

Prop. Colour, grayish-white with a reddish tint; crystalline; very brittle (may be powdered); melts at about 480° Fahr., and does not re-solidify until cooled to 6 or 7° below this point; it volatilises at a strong heat, and, in close vessels, the fumes condense unchanged, in crystalline laminæ; little acted on by the air, but when exposed to it at a high temperature burns with a faint blue flame, emitting yellow fumes which condense into a yellow pulverulent oxide; when slowly cooled, in large masses, it forms large cubic crystals, or octahedrons, of great beauty; nitric acid, somewhat dilute, dissolves it freely. It is highly diamagnetic. Sp. gr. 9·8 to 9·83, which, by careful hammering, may be increased to 9·8827. A bar of bismuth, when heated from 32° to 212°, expands exactly $\frac{1}{710}$ in length.

Uses, &c. Bismuth enters into the composition of STEREOTYPE-METAL, SOLDER, PEWTER, FUSIBLE METALS, and several other alloys. Added to other metals it renders them more fusible. An alloy of *tin*, *nickel*, *bismuth*, and *silver*, is said to hinder iron from rusting. A mixture of *bismuth*, *lead*, and *tin*, i
ployed for taking impressions from
ing moulds, and for other purposes

Bismuth salts are usually insol
composed by any quantity of wate
acid, and a basic salt. They are
colourless, and, except the chl
volatile. They are easily recogni
following reactions:—

Their saturated or concentrate
giving a white precipitate on di
water:—Sulphuretted hydrogen bla
or gives a black precipitate:—The
tion is unaffected by the addition o
acid:—Chromate of potassium giv
precipitate, which differs from that
by being soluble in nitric acid, and
potassa.

Bismuth, Chlorides of:—

Basic Chlo″ride. Bi_3Cl_5. *Syn.*
RIDE OF BISMUTH, PEARL′-POWDE
THI SUBCHLORI′DUM, L. *Prep.*
solution of hydrochloric acid, is d
another of bismuth (prepared by
that metal in nitric acid); and th
precipitate, after being well wash
water, is dried in the shade.—*Prop*
Similar to those of the subnitrate.

Chlo″ride. $BiCl_3$. *Syn.* TERCH
BISMUTH. *Prep.* A mixture of corr
mate, 2 parts; bismuth, 1 part
powder,) is exposed to heat until al
cury' present is expelled, after whi
once put into bottles. A grayish-w
lar substance.

Bismuth, Nitrates of:—

Basic Nitrate. $BiONO_3$. *Syn*
WHITE, BISMUTH SUBNITRATE;
SUBNITRAS, BISMUTHI NITRAS, L.;
FARD, B. D'ESPAGNE*, &c., Fr.;
SCHMINKWEISS, &c., Ger. *Prep.*
1 oz.; *nitric acid*, 1½ fl. oz.; *dist*
3 pints; mix 1 fl. oz. of the wate
acid, and dissolve the bismuth in t
throw the solution into the remai
water, and, after repose, pour off
natant liquor, drain the powder th
sided on a linen cloth, wash it wi
water, and dry it with a gentle hea

Prop. A pearly white, inodoro
insoluble in water, but freely solub
acid; long exposure to a strong lig
grayish. When prepared from a n
tion, it consists of very fine micro
talline laminæ; but when prepared
solutions, with less water, the
acicular, and more silky and lustro
moistened it exhibits an acid rea
litmus paper.

Pois., &c. Like the other salts
it causes vomiting, purging, giddin
insensibility, &c. No certain antidot
The treatment may consist of an
lowed by the copious use of emolli
as weak broth, barley-water, milk
&c.; and subsequently, when n

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[1] Several of these tubes are usually set side by side together.

[2] Usually one to each eliquation-tube.

mmation, by a low diet and

In *medicine*, as a sedative, an tonic, and an antispasmodic, in ions of the stomach unaccom- anic disease of that organ, and a nervous character; particularly , troublesome sickness and vomit- r waterbrash, and generally in al affections attended with 1 intermittent fever, spasmodic *Dose.* 5 to 10, or even 20 grs.

made into an ointment with 4 it has long been employed in c skin-diseases. Under the name TE it is commonly used by ladies ; but it is stated, that it injures ucing, after a time, paralysis of essels, rendering it yellow and an effect which, unfortunately, ttempted to conceal by its freer quent application. In very large isonous.

asic nitrate and the basic chloride pass under the names of PEARL- PEARL-POWDER, owing to their teness and beauty. That of the owever, is usually the former; perfumers, usually the latter, but ently both.

$Bi(NO_3)_3$. *Syn.* NEUTRAL NI- ITRATE. *Purified bismuth* (in small 2 oz.; *nitric acid*, 6 oz.; dissolve adding more acid, if necessary, to e solution of the metal; to the olution add half its volume of ter, filter through powdered glass, te until crystals form.

efly in chemistry, and as a source oxide and the subnitrate.

xides:—

s Oxide. Bi_2O_3. *Syn.* TER- BISMUTH, PROTOXIDE OF BIS- m either the neutral or the basic xposure, in a crucible, to gentle ure. A straw-yellow powder, of lt solubility.

D:—By gradually dropping an of bismuthous nitrate into a con- ution of potassium hydrate per- om carbonic acid, and washing the resulting precipitate. Pure. g white powder.

Fuses at a high temperature, and powerful flux on siliceous matter imparting colour, a property of meller and gilder has long availed e the basic nitrate, it has been ntispasmodic, and as a cosmetic. to 8·355.

xide. Bi_2O_5. *Syn.* BISMUTHIC BISMUTHIC ACID. Suspend ter- uth in a strong solution of potassa, rine through the mixture until n is complete; treat the powder tric acid (to remove any undecomposed teroxide), after which wash it in cold water, and dry it.

Prop., &c. A reddish powder, insoluble in water. Its salts, of which little are known, are called BIS'MUTHATES. When heated it loses oxygen, and a bismuthate of bismuth is formed.

Bismuthous Sulphide. Bi_2S_3. This compound occurs native (BIS'MUTHINE), and may be easily prepared artificially by either fusing its elements together, or by passing sulphuretted hydrogen through a solution of nitrate of bismuth.

Bismuthous Valerianate. *Syn.* BISMU'THI VALERIA'NAS, L. *Prep.* An acid solution of nitrate of bismuth is decomposed with a solution of valerianate of soda in water containing a little free valerianic acid; the precipitate is carefully washed in distilled water, and dried in the shade. Recommended as superior to the subnitrate in some forms of gastrodynia, dyspepsia, intermittents, &c.—*Dose.* 2 to 6 grs., or more.

BIS'TRE (-ter). [Eng., Fr.] *Syn.* BISTER, Ger. *Prep.* 1. The most compact, best coloured, and well-burnt portions of the soot of beechwood, or of peat,[1] are selected, reduced to powder, and sifted through a very fine lawn sieve. It is then digested in clear warm water for several hours, with frequent stirring; after which it is allowed to settle, when the liquid portion is decanted from the sediment. This process is repeated a second, and even a third time. The paste is next poured into a tall narrow vessel, which is then filled with pure cold water, and well agitated. The grosser parts only are now allowed to subside,[2] and the supernatant liquor, containing the finer portion of the BISTRE in suspension, is poured off into another vessel, where it is left to deposit its contents. The deposit is next collected, and carefully dried and powdered; or it is only partially dried, and at once made into cakes with gum-water, or isinglass-size, and then allowed to dry and harden for sale.

2. (Dr. MacCulloch.) The tar-like liquid obtained from the dry distillation of wood, is again carefully distilled until all volatile matter has passed over, and a brittle, pitch-like residuum is obtained, which is either brown or black according to the time and temperature employed; after which the heat is still further prolonged, but with increased care, until the brittle substance becomes pulverulent, and carbonaceous. It is then ground and elutriated with pure cold water, as before.

Uses, &c. As a water colour to tint drawings, in the same way as Indian ink, to which it is esteemed superior when the subjects are intended to be afterwards tinted with other colours. It occupies the same place among water colours that brown-pink does in oil.

According to Dr. MacCulloch, bistre from wood-tar, when carefully prepared, has great *depth and beauty of colour*, with all the fine properties of sepia; but that if the whole of the oils and acids have not been removed by the process, it is apt to collect in little flocks, which interfere with its use.

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[1] *The first is usually employed in England.*

[2] *Two or three minutes suffice for this purpose.*

BITES and STINGS. *Syn.* MOR'SŪS (-SŪS, *sing.*) ET IC'TŪS (-TŪS, *s.*), L. The treatment of the bites of non-venomous and non-rabid animals is the same as that of ordinary lacerated or punctured wounds, as the case may be; that of the bites and stings of venomous and rabid animals, serpents, insects, &c., often require, in addition, the use of special antidotes to destroy the virus, or to prevent its absorption, or to neutralise its effects when absorbed and to promote its elimination from the system.

The bites and stings of ANTS, BEES, WASPS, HORNETS, and similar insects common to this climate, may be treated by washing the part with spirit of hartshorn or dilute liquor of ammonia, or eau de luce, or a weak solution of chloride of lime. Should considerable inflammation ensue, and the part become much swollen, a thing that rarely occurs, leeches may be applied, and a cooling purgative given. The stings of venomous reptiles may be similarly treated, excepting that the strength of the solutions of ammonia, chloride of lime, &c., should be stronger than in the former case, so as to produce some pain and smarting. In cases where the venom is of a very poisonous description, the wound should be first well washed with water of ammonia, and afterwards seared with lunar caustic in every part, including the interior and deep-seated portions. In extreme cases, the surface of the wound, both internal and external, may be removed with the knife; or, in the case of a small joint, as a finger, the injured portion may be amputated. Prior to the use of the washes or caustic, dry-cupping or suction with the mouth may be had recourse to with great advantage. A ligature placed on the limb, above the wound, as soon as possible after the accident, will impede the absorption of the poison whilst the other treatment is in progress. A similar plan may be followed after the bite of a dog supposed to be mad. It has, indeed, been lately asserted by one of our most celebrated veterinarians, that he and his colleagues have been repeatedly bitten by dogs that have afterwards been proved to be mad, but from having fearlessly applied caustic to the parts, they have escaped uninjured.

The poison inserted by the stings and bites of several venomous reptiles is so rapidly absorbed, and of so fatal a description, as frequently to occasion death within a very short space of time, and before any remedy or antidote, under ordinary circumstances, can be applied. But even in these extreme cases it is probable that absorption, and consequently the rapidity of the action of the poison, might be considerably impeded or lessened by the *immediate* application of a ligature above the *part, as before described,* the patient accompanying the treatment by swallow
quantity of liquid, by which part
would be produced, and the func
absorbents for a time nearly su
few minutes, thus gained, would p
application of appropriate antidot
the poison might be neutralised be
become necessary to remove the lig
the kidneys would be in full acti
tunately, these wounds are gener
in parts of the world where p
measures are seldom thought of, a
at times when people are least
meet them, as well as so sudden
pectedly as to stagger even tho
who may be in no absolute danger
Such is the bite of the East India
CAPEL'LO, against which two *Asiat*
pills are often prescribed by the
which are generally scarcely swall
the poison of the serpent has
patient a stiffened corpse. *Ea*
favorite remedy in India, when
ployed both internally and exter
to prove sometimes more success
of the PUFF-ADDER is of a simila
more fatal description than that
When the venom of any of these
a rabid dog, is once fully absor
system, there appears to be no tr
can save the patient. A bottle
wine, or ½ a pint of brandy or
with twice its weight of water,
doses, about 3 or 4 minutes apart,
remedy in India, in such cases.
to impede absorption.

The secret antidote so long suc
ployed by Mr. Underwood, the 's
Australia, for the bites of the WHI
the DIAMOND-SNAKE, two of th
mous of that region, is now positi
to be the common male fern (
fi'lix mas, Linn.). Of the powd
preferably, of the green leaves
nearest the root, he prepares a
tion, or broth, which he takes o
liberally. A more convenient
would, perhaps, be a tincture
digesting 1 *oz.* of the *dried,* or
fresh leaves, (bruised,) in a pint o
or strong brandy or rum, for a
in this state it could be kept fo
of time, if well-corked, without

[See HYDROPHOBIA, POISONS,
STINGS, VENOM, WOUNDS, &c.[1]]

BITT'ER. [Eng., Ger.] *Sy*
L.; AMER, Fr. Tasting like
quassia, or other similar vegeta
bitter plant, bark, or root (= A
see *below*).

Bitter App'le‡. Colocynth.

Bitter Cup. A cup or tumble

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[1] Notices of several chemical and new
great promise, will also be found in diffe
volume. The names of the respective
wise be referred to.

of quassia wood. Liquor, by
short time, becomes bitter and
ey are now common in the

'. **Magnesia.**
. See **Bitters** (*infrà*) and
r).

Bitter Pur''ging-salt. Sulphate

. Woody nightshade.

(-wŭrt). Gentian.

The 'mother-water' or 'bitter
works from which the chloride
a-salt) has been separated by

intoxicating poisonous mixture
wers' druggists, composed of 1
tract of quassia and *powdered*
ɔa, with 2 parts of *extract of*
s, 4 parts of *Spanish liquorice*,
parts of *treacle*; the liquorice
ed with a little water until dissolution evaporated to a proper
ore adding the other ingredients.
ulent brewers and publicans to
bitter and apparent strength to

-ĕrz). *Syn.* **Ama''ra**, &c., L.
ers are commonly regarded as
achic, and to improve the appe-
occasionally, and in moderation.
is early in the morning, or half
hour before a meal. An exces-
rolonged use of them, tends to
omach, and to induce nervous-
ould not be taken for a longer
bout 8 or 10 days at a time, al-
ar period to elapse before again
e to them.

most useful and generally em-
are—*calumba, cascarilla, cha-*
ian, hops, orange peel, quassia,
L

the liquor-trade, a compound
steeping vegetable bitters, and
s as flavouring, in weak spirit,
10 days; a little sugar or syrup
ently added to the strained or
ture. In that of the taverns
the menstruum is usually gin,
it reduced to a corresponding
AN'DY-BITTERS and **WINE'-BIT-**
ared in a similar way with com-
randy, or some cheap white wine
in), as the case may be. Each
ally his own formulæ, which he
uit the price, and the palate of
—This class of liquors has been
l with being the fertile cause of
mperance, of disease, and even of
ir occasional use as tonics or
also objectionable, owing to the
m deleterious substances, which
enter into their composition.

L.

. [*Eng., L.*] *Syn.* *Bitume, Fr.*; **Erdpech, Erdtheer**, &c., Ger. A term of a very comprehensive character, and, in general, very loosely applied, including a variety of inflammable mineral substances, of which *asphaltum, naphtha*, and *petroleum*, may be mentioned as examples. The solid bitumens are now extensively employed in the manufacture of *bituminous mastic* or *cement* and similar compositions, which are used for the lining of water-cisterns, and for various other hydraulic purposes; as also for roofs, floors, pavements, &c. For the last purpose, the native varieties of 'asphaltic rock,' consisting of a mixture of bitumen and calcareous earth, when tempered with a proper quantity of crushed granite, or calcareous sand or gravel, is found to be the most substantial and durable. The plan followed in laying down such pavements in Paris, where they have been the most extensively adopted, is—The ground having been made uniformly smooth, is edged, in the usual manner, with curb-stones rising about 4 inches above its level, and then covered, to the depth of 3 inches, with concrete (made with about 1-6th part of good hydraulic lime), which is well pressed upon its bed, the surface being subsequently smoothed over with a very thin coating of hydraulic mortar. On this, when perfectly dry,[1] the 'bituminous mastic,' rendered semi-fluid by being cautiously heated in a suitable iron cauldron,[2] is evenly spread over so as to form a layer three quarters of an inch, or for less solid work, half an inch thick. Some coarse sand is lastly sifted over and pressed down on the surface, when the work is complete; and in a few days the pavement becomes sufficiently compact and solid to be thrown open to foot passengers.

The asphalto-bitumen mine of the Val de Travers, in the Canton of Neufchâtel, is said to be the richest and most extensive in the world of its particular class. The calcareous bitumen which it yields contains 20% of nearly pure bitumen, and 80% of carbonate of lime; and it has a sp. gr. (2·115) approaching that of ordinary bricks.

The 'Val de Travers Company,' and the 'Bastenne and Gaujac Company,' are those who have hitherto been the most successful in laying down asphalto-pavements. See **Asphaltum**, **Petroleum**, &c.

Bitumen, Elastic. *Syn.* **Min'eral caou'-tchouc** (kōō'-chōōk), **El'aterite.** A rather rare species of bitumen, differing chiefly from the other solid varieties in being elastic.

Bitumen, Liq'uid. Petroleum.

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[1] On this point depends the success of the work. Absolute dryness is a sine quâ non in the process. The mastic must also be laid down in dry weather. If laid in wet, damp, or even foggy weather, it will be liable to separate from its bed, and gradually to break up. This is why so much of the asphalt and bituminous pavement laid down in London, has proved a failure.

[2] It is here that the mixture of the bitumen (previously crushed sufficiently small to pass through meshes 10 to the inch) is made with the sand or gravel; a small portion of mineral tar or coal-tar (3 to 7 or 8%) being commonly added to promote their fusion and complete union.

BITU'MINOUS. *Syn.* BITUMINO'SUS, L.; BITUMINEUX, Fr.; ERDPECHIG, Ger. Of bitumen, or resembling or containing it.

BIX'EINE (-e-ïn). The red colouring-principle of annotta. It is obtained by treating bixine with liquid ammonia, with subsequent free contact of air.

Prop., &c. When pure, a rich deep-red powder, soluble in alcohol and in alkalies, and turned blue by sulphuric acid. It appears to be oxidised bixine.

BIX'INE (-ïn). The yellow colouring-principle of annotta.

Prep. A solution of annotta is precipitated with a solution of acetate of lead; the precipitate, after having been washed in cold water, is decomposed by sulphuretted hydrogen; the decanted liquor or filtrate yields crystals by cautious evaporation.

Prop., *&c.* Yellowish white, turning full yellow by exposure to air; soluble in water, and freely so in alcohol and in alkaline solutions; by oxidation it is converted into *bixeine*. For a correct knowledge of both of these substances we are indebted to M. Preisser.

BLACK. *Syn.* A'TER,[1] NI'GER, L.; NOIR, Fr.; SCHWARZ, Ger.; BLAC, BLÆC, Sax. In *dyeing*, &c., of the colour of lamp-soot, or of night; *subst.*, a black colour.

Black Ash. The waste lye of the soapmakers is evaporated in large iron boilers, the salt separated as it falls down, and then heated in a reverberatory furnace until it is partially decomposed and fused, when it is run into iron pots to cool. It is used in the manufacture of alum and common soap.

Black Col'ours (kŭl'-). See BLACK PIGMENTS.

Black Draught. See SENNA MIXTURE (Compound).

Black Drop. See DROPS, PATENT MEDICINES, &c.

BLACK DYE. *Syn.* TEINTE NOIRE, Fr.; SCHWARZE FARBE, Ger. The following are the processes and materials now commonly employed in dyeing black:—

a. For COTTON:—

1. The goods, previously dyed blue, are steeped for about 24 hours in a decoction of gall-nuts or sumach, then drained, rinsed in water, and passed through a bath of acetate of iron for a quarter of an hour; they are next again rinsed in *water*, and exposed for some time to the air; after which they are passed a second time through the bath, to which a little more iron-liquor is previously added. The whole process is repeated, if necessary, according to the intensity of the shade of black desired.

2. The goods are steeped in a mordant of acetate of iron, worked well, and then passed through a bath of madder and logwood for 2 hours. Less permanent than No. 1.

Obs. About 2 *oz.* of coarsely pow
or 4 *oz.* of sumach, are require
pound of cotton, in the process
The first should be boiled in the w
proportion of about ½ gal. of wate
of cotton. The sumach-bath is be
mere infusion of that dye-stuff
water.

3. (For 10 lbs. of cloth.) The g
into a boiling bath made of 3 lbs
and allowed to steep, with occasion
until the liquor is perfectly col
next passed through lime water,
having drained for a few minutes,
transferred to and worked for a
warm solution of 2 lbs. of copperas
exposure to the air, for about a
are again passed through lime wat
draining, 'worked' for an hour in
with 3 lbs. of logwood, and 1 lb. of
are then 'lifted,' and ¼ lb. of co
added, they are returned to the ba
well for about 30 minutes, and fini
and deep.

Obs. Instead of copperas iron-li
used, observing to take 1½ pint of
the ordinary strength) for every
former ordered above.

b. For FLAX and LINEN:—

This, for the most part, close
that employed for cotton; but, in
a mordant of iron-liquor, or
followed by passing the goods th
water, and exposure to the air,
dye-bath.

c. For SILK:—

Silk goods are dyed much in th
as woollens, but the process is co
less heat:—

1. A bath of nut-galls is give
36 hours, occasionally working
therein; they are next taken out
well aired, after which they are
few minutes through a bath co
phate of iron, and are then ag
rinsed, and aired. The steep in
bath may be repeated, if necessa
as before, by the iron-bath prev
nished with a little fresh copperas.
quantity of galls to be taken for
varies with their quality from ½
of the copperas (for the first bath
4 *oz.*

2. (For 1 cwt. of silk.) Boil 22 *l*
Aleppo-galls, for 2 hours, in 90 to
water, observing to add boiling
time to time, to compensate for
evaporation; to the clear bath a
copperas, 7 lbs. of iron-filings, an
gum; digest with agitation, for
when the ingredients are dissolv
silk (previously prepared ['galle
of its weight of gall-nuts) through
about an hour; then rinse and air
leave it in the dye-bath for 6 to 1
this immersion or steep may be

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[1] *Black, deep black; as opposed to albus*, white.

will. This is said to be the pro-
;y adopted for velvet at Genoa

s. of silk.) Turn the goods for an
a mordant formed of 1 lb. of cop-
z. of nitrate of iron (dyer's), with
er; after rinsing in cold water,
:m, 'work' them, for an hour, in
ade of 5 lbs. of logwood and 1 lb.
:n lift them from the bath, add
ras, re-immerse, and 'work' them
15 minutes longer; lastly, rinse,
. A full deep black.
s.) For the mordant use ½ lb. of
se, and air; for the 'dye-bath,' a
; lbs. of logwood to which ½ pint
has been added; after 'lifting'
d 2 *oz.* more of copperas to the
:k for 15 minutes, as before. A
By adding 2 *oz.* of dyer's nitrate
e mordant the same ingredients
:ep black; and by substituting a
oap for the urine, and omitting
of copperas to the logwood-bath,
blue-black. The last may also be
first dyeing the goods deep blue
siate,' and omitting the urine and
:h case one half only of the log-
: required.
OOL:—
:e a good permanent black on wool,
goods, they must be first dyed of a
1 the indigo-vat, or, more cheaply,
sian-blue process. When the goods
r common, and price is an object,
enerally 'rooted' instead of being
This consists in giving them a dun
olour with the husks of walnuts, or
f the walnut-tree, or with other like
ingent substances.
1 *cwt.* of wool.) Good logwood-chips,
d Aleppo-galls, 18 *lbs.*; are inclosed
e bag, and boiled with water, q. s.,
hours; ⅓rd of this decoction is then
d into another copper, with verdigris,
l a sufficient quantity of water having
d, the goods (previously dyed dark
passed through the liquor for two
a heat slightly below the boiling-
he goods are next lifted and drained,
⅓rd of the decoction of logwood and
h copperas, 9 *lbs.*, added to the boiler,
ich the fire is lowered, and as soon as
eras is dissolved, the cloth is returned
th, and again well 'worked' for at
hour. It is then taken out, thoroughly
d the remaining ⅓rd of the decoction
with sumach, 20 *lbs.* The whole is
ght to a boil, and sulphate of iron, 2
ether with a pailful of cold water,
n; after which the goods are put in a
, and 'worked' for one hour; they
taken out, rinsed, aired, and again
through the bath for another hour.
ing thoroughly rinsed, the *goods are*
either 'fulled,' dried, and folded, or

are further softened and beautified by passing them for 15 minutes through a hot weld-bath (not boiling), when they are rinsed, &c. (but not 'fulled'), as before. A beautiful though expensive dye. With management, the above quantities of the ingredients will dye 1¼ or even 1½ *cwt.* of wool.

2. (For 1 *cwt.*) The cloth (previously dyed blue) is 'galled' with 5 *lbs.* of nut-galls, and then dyed in a bath made with 30 *lbs.* of logwood, to which about 5 *lbs.* of copperas has been added; after which it is rinsed, aired, and 'fulled,' as before. This is said, by Lewis, to be the usual proportions and plan adopted by the English dyers.

3. (For 1 *cwt.*) Make a bath, as before, with fustic, 2 *lbs.*; logwood, 5 *lbs.*; and sumach, 10 *lbs.*; work the (blued) cloth for 3 hours at the boiling heat, or near it; lift it out, add sulphate of iron, 10½ *lbs.*, and when dissolved, pass the cloth through it for 2 hours; rinse, air well, and again pass the goods through the bath for an hour; lastly, rinse until the water runs clear. Inferior to the last, but less expensive.

4. (For 1 *cwt.*, without previous blueing or 'rooting.')—*a.* Work the goods, at about 200° Fahr., for 1 hour, in a bath made with 6 to 7 *lbs.* of cam-wood; lift, add 6½ *lbs.* of copperas, and again work the goods for an hour, after which withdraw the fire, and allow them to steep for 10 or 12 hours; next drain and rinse them, and work them in a second bath made with 60 *lbs.* of logwood for 1½ hour; lift, add 3 *lbs.* of copperas, and again work for an hour; lastly, rinse, air, and finish:—*b.* The goods are first worked, for about two hours, in a bath of 3 *lbs.* of fustic, in which 5 *lbs.* of bichromate of potash and 4 *lbs.* of alum have been dissolved; after exposure to the air for about an hour, and thorough rinsing, they are worked for a second two hours in a bath made with 45 *lbs.* of logwood, 3½ *lbs.* of barwood or cam-wood, and 3 *lbs.* of fustic; they are then lifted, and 3 *lbs.* of copperas having been added to the bath, are again immersed and worked for half an hour to an hour.

5. (For 10 *lbs.* of wool or w.-cloth.) Work the goods for ½ an hour in a bath of ½ *lb.* of cam-wood; lift, add 7 or 8 *oz.* of copperas, and after working them for 20 minutes, withdraw the fire, and leave them in the liquor for 10 or 12 hours; next rinse them in cold water, drain, and then work them for an hour in a bath made with 5 *lbs.* of logwood, to which 1 pint of urine has been added; lift, add 4 *oz.* of copperas, work them for half an hour longer, and, lastly, wash and dry them.

6. (For 7 *lbs.*) Take of galls (bruised), ¼ *lb.*; logwood chips, 1½ *lb.*; for the bath; boil or work the goods for 2 hours, take them out, add of copperas, ¼ *lb.*; and when it is dissolved, work the goods through the liquor for at least 2 hours, keeping the bath nearly boiling; *again take them out,* wash, and air; then add *1 oz. more of copperas* to the bath, and pass

the cloth through it for another hour; lastly air, rinse, and finish.

7. (For 5 *lbs.*) For the first bath—bichromate of potash, 8 *oz.*; alum, 6 *oz.*; fustic, 4 *oz.*; for the second bath—logwood, 4 *lbs.*; barwood and fustic, of each, 4 *oz.*; to which add, after the lift, copperas, 4 *oz.*; the process being conducted as in 4, *b*. This, as well as the two formulæ immediately preceding it, is particularly suited to articles of dress dyed in the small way, at home. When the articles are only re-dipped, as it is called, a proportionately smaller quantity of the ingredients may be taken.

Concluding remarks. In dyeing black, particularly on wool, it is absolutely necessary to take the goods out of the dye-bath several times, and to expose them to the air. This is called "airing" them, and is done to allow the oxygen of the atmosphere to act upon the ingredients of the dye, and especially on the iron; as without this action of the air a good colour cannot be produced. The usual proportions employed by the dyers of England are 5 *lbs.* each of galls and copperas, and 30 *lbs.* of logwood, for every *cwt.* of cloth; but these weights are frequently increased for choice goods, just as they are always lessened for common ones. The other astringent substances used as substitutes for galls in dyeing black, are taken in quantities proportionate to their respective strengths, that of good Aleppo gall-nuts being referred to as a standard.

The German wool-dyers usually commence their process with a mordant of Salzburgh vitriol (3 parts) and argol (1 part); and after exposure of the goods, in a cool place, for 24 hours, work them in a bath of logwood (5 to 6 p.) and fustic (2 p.); after which the bath is restored by the addition of verdigris (¼ p.) dissolved in vinegar and the goods again worked through it for about ½ an hour. This is for 20 parts weight of wool or cloth.

Black marinos are usually mordanted (hot) with about $\frac{1}{10}$*th* of their weight of copperas, and then aired for 24 hours; after which they are dyed in a boiling bath made with about ½ their weight of logwood with the addition of about 2% of argol or tartar.

As black is the shade most commonly attempted by amateur dyers, it may be here necessary to call their attention to what is said on mixed fabrics in our article on DYEING; since an inattention to this point will inevitably cause the failure of their efforts.

According to Muspratt, a mixed fabric of silk and woollen may be dyed black, by one process, as follows:—Work the goods an hour in a solution of 8 *oz.* each of tartar and copperas, and wash out; work for 15 minutes in a decoction of 4 *lbs.* of logwood; lift, add 1 *oz.* of bichromate of potash, work for ½ an hour, and dry. And a mixed fabric of cotton, silk, and woollen:—Steep for six hours in a bath made of 2 *lbs.* of sumach; then work for an *hour in a solution of 6 oz.* each of tartar, sulphate of copper, and copperas;
work ½ an hour in a decoction
logwood; lift, add to the bath
peras; work ten minutes, wash,
a very deep black be required, 1
to be added with the logwood.
MORDANTS, &c.

BLACK LEAD (lĕd). See PLU

BLACK PIG'MENTS. *Syn.* P
GRA, L. The principal black pig
merce are obtained by carbonising
stances (particularly bones), by
dull red heat, in covered vessels
with the air; or by collecting th
during the combustion of unctu
and bituminous matters. Artis
teurs also prepare, on the small s
of blacks, many of which are n
at the colour-shops. This they ef
the carbonisation of substances
employed for the purpose, or b
ducing to powder certain minera
selected on account of the pecul
colour which they respectively po
of the last might, however, be
priately classed with browns. T
list embraces most of these articl

An'imal-Black. Bone-black.

Beech'-Black. Carbonised beec

Blue'-Black. Vine-twigs drie
carefully carbonised, in covered
of the proper shade. That of
was made of wine-lees. Pit-co
burnt at a white heat, then quenc
dried, and well ground, forms a
and durable blue-black, fit for m
purposes. See FRANKFORT-BLAC

Bone'-Black. *Syn.* I'VORY-BLA
merce); CAR'BO OS'SIS, OS US'TU
E'BUR U. N. (vena'le), &c., L.; N
FR.; KNOCHENSCHWARTZ, &c., G
ised bones reduced to powder. T
merce is usually the residuum of th
of bone-spirit. Inferior to true
having a slight, but peculiar r
from which the latter is quite f
its use as a pigment, it is extensiv
in making blacking, as a mat
moulds of founders, as a clarifier
of liquids, &c. See IVORY-BLA
MAL CHARCOAL.

Cas'sel-Black, Cologne'-Black.

Coal'-Black. See BLUE-BLAC
CASTLE-BLACK.

Composi"tion-Black (-zĭsh'-ŭn-
lected portion of the residuum of
of making prussiate of potash fr
hoofs.—Used both as a pigment
colour organic solutions, which i
than bone-black.

Cork'-Black. Spanish-black.

Flo"rey-Black, FLORÉE D'INDE.
scum of the dyer's wood-bath.
blue-black.

Frank'fort-Black, NOIR DE
From vine-twigs dried, carbonis

:n ground very fine. An excel-
ment; also used by the copper-
:o make their ink. See BLUE-

lack. Resembles ivory-black,
usually sold for it. It was for-
by carbonising the residuum of
of spirit of hartshorn.
Syn. CAR'BO EB'ORIS, E'BUR
:M, L.; NOIR D'IVOIRE, &c.,
NSCHWARTZ, KOHLE VON EL-
From waste fragments and
ry, by careful exposure in co-
, avoiding excess of heat or
The whole having been allowed
: cold, the crucibles are opened
nts reduced to fine powder. For
y only the richest coloured por-
rcoal is selected, and this, after
l, is ground with water on por-
on a filter with warm water, and
very rich and beautiful black.
han even peach-stone black, and
om the reddish tinge of bone-
white-lead it forms a rich pearl-
NE-BLACK.
ack (-mā'-). Sugar-black.
k. *Syn.* FULI'GO LUCER'NÆ, F.
L.; NOIR DE FUMÉE, &c., Fr.;
, Ger. *Prep.* 1. (On the small
ical funnel of tin-plate furnished
pipe to convey the fumes from the
suspended over a lamp fed with
oal-tar, or crude naphtha, the
rge and so arranged as to burn
oky flame. Large spongy, mush-
cretions of an exceedingly light,
carbonaceous matter, gradually
ummit of the cone, and must be
m time to time. The funnel should
the smoke-pipe by means of wire,
r should be used for the joints of

ercial.) On the large scale, lamp-
generally made by burning bone-
ly freed from its ammonia), or
al-tar, and receiving the smoke
chamber. In the patented process
Martin and Grafton, the coal-tar
agitated with lime-water until the
l mixed, after which it is allowed
and the lime-water having been
he tar is washed several times with
After subsidence and decantation,
o stills, and rectified. The crude
the receiver is then put into a long
the furnished with numerous large
neath which is a furnace to heat
nearly the boiling-point. Over
is a sort of funnel which goes into
pipe or main, which thus receives
from all the burners. From this
oke is conveyed by large pipes to
t of boxes or chambers, and thence
s of *large canvas bags arranged*
and connected together at top and bottom alternately. Fifty to eighty of these 'bags' are employed; the last one being left open to admit of the escape of the smoke, which has thus been made to traverse a space of about 400 yards. As soon as the bags contain any considerable quantity of black, they are removed and emptied. The black deposited in the last bag is the finest and best, and it becomes progressively coarse as it approaches the furnace.

Obs. The state of minute division in which the carbon exists in good lamp-black is such as cannot be given to any other matter, not even by grinding it on porphyry, or by 'elutriation' or 'washing over' with water. On this account it goes a great way in every kind of painting. It may be rendered drier and less oily by gentle calcination in close vessels, when it is called burnt lamp-black, and may then be used as a water-colour; or its greasiness may be removed by the alkali-treatment, noticed under Indian ink. It is the basis of Indian ink, printer's ink, and most black paints.

Russian Lamp-black is the soot produced by burning the chips of resinous deal. It is objectionable chiefly from being liable to take fire spontaneously when left for some time moistened with oil.

Manganese'-Black (-nēze'-). Native *binoxide of manganese.* Durable and dries well.

New'castle-Black. From the richer-looking varieties of pit-coal by grinding, and elutriation. Brown black or, in thin layers, deep brown. It is, perhaps, "the most useful brown the artist can place on his palette; being remarkably clear, not so warm as Vandyke-brown, and serving as a shadow for blues, reds, and yellows, when glazed over them. It seems almost certain that Titian made large use of this material." See BLUE-BLACK (*antè*).

Opor'to-Black. Carbonised wine-lees.

Par'is-Black, NOIR DE PARIS. From turner's bone-dust, treated as for ivory-black. Works well both in oil and water. It is commonly sold for real ivory-black, and for burnt lamp-black.

Peach-stone Black. From the stones or kernels of peaches, cherries, and other similar fruits, treated as for ivory-black. A bright, rich black; works well with oil; with white-lead and oil it makes old gray.

Pit'coal Black. Newcastle-black.

Prus"sian-Black. (prŭsh'-ăn). Composition-black.

Rice'-Black. Rice-charcoal. Inferior.

Rus"sian Black. See LAMP-BLACK.

Soot'-Black (sŏŏt'-). The soot of coal-fires, ground, and sifted. Used in common paint, and to colour whitewash; with Venetian-red and oil, it makes chocolate-colour; also used to make gray mortar.

Span'ish Black. From cork-cuttings carbonised, as bone-black. Resembles Frankfort-black, *but works softer.*

Sug'ar-Black (*shŏŏg'-*). Carbonised moist *sugar. Has little* body, but for washing drawings is equal in mellowness to Indian ink and bistre.

Sun'derland Black. Newcastle-black.

Turn'er's Black. Paris-black.

Vine'-twig Black. Frankfort-black.

Wheat'-Black (hwēte'-). Carbonised wheat. It has a good colour, a full body, and dries hard and quickly with oil.

BLACK'BERRY. The popular name of *ru'bus fructico'sus* (Linn.) or the common 'bramble.' *Fruit* (BLACK'BERRIES; MÛRES DE RONCE, Fr.), antiscorbutic and wholesome, but in excess apt to sicken; twigs, used in dyeing black; root, astringent, formerly used in hooping-cough.

Amer'ican Blackberry. The *ru'bus villo'sus* (Ait.). Root, astringent and tonic; officinal in the Ph. U. S.

BLACK'ING. *Syn.* CIRAGE (des bottes), NOIR (pour les souliers), Fr.; SCHWÄRZE, SCHUHSCHWÄRZE, Ger. An article too well known to require description.

Hist., *&c.* Blacking, and other polishes for leather, were undoubtedly in common use among the ancients; but the compound to which we now more particularly apply the name is of comparatively modern invention. The latter appears to have been first introduced into England from Paris, during the reign of Chas. II, but was not in common use among the masses of our population much before the middle of the 18th century.

The general and still increasing use of blacking as a polish for boots and shoes by all classes of the inhabitants of civilised countries, has given an extent and importance to its manufacture which a stranger to the subject would scarcely be led to suspect. The princely establishments of some of the firms who compound this sable article, cannot fail to have arrested the attention of the passenger through the streets of this great metropolis; whilst the enormous fortune acquired by one of their late members, and, for the most part, bequeathed by him for purposes of charity and philanthropy, has invested both the donor and his craft with an interest and notoriety which they did not previously possess. At the present time, the consumption of blacking is greater than at any former period; and of this, as of many other articles, England is the principal manufactory for the world, alike distinguished for the extent of her trade and the excellent quality of this product of her industry. In truth, England excels all other nations in the manufacture of common shoe-blacking; and, perhaps, in no other country is an equal attention paid to the cleanliness and appearance of the external clothing of the feet.

Prep. I. LIQUID BLACKING:—

1. Take of bone-black, 16 parts; treacle, 12 parts; oil of vitriol, 3 parts; sperm oil,[1] 2 parts; gum-arabic, 1 part; strong vi
sour beer, 48 to 50 parts;[2] (all by w
place the bone-black in a capaciou
stone-ware, or enamelled iron vessel,[3]
oil, and rub them well together; g
dually add the treacle, and acti
patiently grind or rub the mass, af
addition, until the oil is perfectly
and finally for some time afterwards, t
complete admixture; then cautious
the vitriol with about three times its
water, and add it, in separate portion
former mixture, observing to stir th
together, as rapidly as possible, on ea
tion of the acid, and for some minu
the whole is added, so as to render t
thoroughly smooth and homogeneous
stand, covered over, for two or three
longer, stirring it, in the mean time, f
20 minutes daily; lastly, having dissol
gum in the vinegar, add the solution
ally to the rest, and stir the whole t
briskly for some time, and again d
3 or 4 days. It may be further dil
will, with a little more vinegar or beer,
water; but unnecessary or excessive
should be avoided, as the richness and
of the blacking become proportional
duced. If all the ingredients (exc
vitriol) be made hot before admixtu
shining quality of the product will be
improved, and the process may be
ened.[4]

2. Ivory-black, 16 parts; treacle, 8
oil of vitriol, 4 parts; (diluted with
2 parts; oil, 2 parts; gum-arabic, 1
soft water (for the final dilution, ins
vinegar), 64 parts; mixed, &c., as
Excellent.

3. As the last; but taking only 6 p
treacle, 1 part of oil, and omitting th
arabic. Good. A commoner article o
blacking does not sell.

4. (Bryant and James's INDIA-
LIQUID BLACKING.—*Patent* dated 18
of India rubber (in small pieces), 18
rape oil, 9 *lbs.* (say 1 *gal.*); dissolve
solution add of ivory-black (in very
der), 60 *lbs.*; treacle, 45 *lbs.*; mix th
further add of gum-arabic, 1 *lb.*, dis
vinegar (No. 24), 20 galls.; reduce th
to a perfect state of smoothness an
ture by trituration in a paint-mill; t
compound into a wooden vessel, and a
gradually, of sulphuric acid, 12 *lbs.*;
the stirring for ½ an hour, repeating
for 14 days; then add of gum-arabic

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[1] *Sperm oil* is commonly regarded as the *best* for *blacking*; but *pale seal oil* is thought by some to be quite as good. The *cod-liver oil* of the curriers, if clear, is less expensive, and probably better than either of them
olive oil, and *refined rape oil*, are, however,
generally used by the blacking-makers.

[2] That is, 3 to 3½ times the *weight* of the

[3] Metallic vessels must be avoided.

[4] By taking the 'parts' ordered in this and
formulæ as so many ¼ *lbs.*, *lbs.*, ¼ *cwts.*, or *cwt.*
portions of each ingredient for any quantity
from a ¼ of a *lb.*, or a ¼ *pint*, up to 2 *tons*, or
galls., will be at once seen; and so on of
quantities. See Concluding Remarks (*infrà*).

lbs.;[1] again mix well, and repeat
for ½ an hour daily for 14 days
the liquid blacking will be ready
or bottling. The quality is very
it this, probably, does not depend
nce of the India rubber, but on
orrectness of the proportions, and
l completeness with which they

st *Vitriol.*) Take of ivory-black
powder), 2 *lbs.*; treacle, 1½ *lb.*;
pint; mix, as before; then add of
l *oz.*; (dissolved in) strong vine-
mix well; the next day further
vinegar, or strong sour beer, 3 to
q. s.); stir briskly for a ¼ of an
ain once a day for a week. Ex-
cheaper, but inferior article, may
the reductions and omissions no-

aste-blacking (see *below*), by re-
th sufficient vinegar, sour beer, or
e it the liquid form.[2]

BLACKING:—

ies from good to super-excellent
ade from any of the preceding
y simply omitting the final dilu-
the vinegar, sour beer, or water,
ered at the end of the process.

nt and James's **INDIA-RUBBER**
ACKING.—*Patent* dated 1836.) Of
er oil, ivory-black, treacle, and gum-
same as for their liquid blacking
above), but dissolving the last in
s. (say 5 quarts), instead of 20 galls.
; grinding to a smooth paste in a
l, and then adding of oil of vitriol,
s before. The mass is to be stirred
a week, when it will be fit for use, or
Excellent.

ry-black, 1 cwt.; treacle, 28 lbs.; rape
her cheap oil), 1 gal.; mix, as before;
l of oil of vitriol, 21 *lbs.*; (diluted with)
galls.; mix them quickly and tho-
by forcible stirring with a strong
spatula, and as soon as admixture is
, but whilst still fuming, put the cover
sh, and leave it till the next day, when
further stirring) it will be fit for use
Good ordinary. Used for packets

the last; but adding with the ivory-black, &c., 14 to 28 *lbs.* of coal-soot[5] (sifted), omitting one half of the oil, and diluting the vitriol with an extra gal. of water. Inferior. Chiefly used for 1*d.* and ½*d.* packets.[6]

5. (**GERMAN BLACKING.**) Ivory-black, 1 part; treacle, ½ part; sweet oil, ⅛ part; mix, as before; then stir in a mixture of hydrochloric acid, ⅛ part; oil of vitriol, ¼ part (each separately diluted with twice its weight of water before mixing them). This forms the ordinary paste-blacking of Germany, according to Liebig.

6. (*Without Vitriol.*) As I, 5 (*ante*); but with the omission of the last ½ gal. of 'vinegar.'

Concluding remarks. To produce a first-rate article of blacking it is absolutely necessary that the ingredients be of the best quality, and used in the proper proportions; and that the order of their admixture, and the general manipulations, be conducted, under ordinary circumstances, in the manner described in the first of the above formulæ. The proportions of the treacle and the oil (the most expensive of the ingredients) should not be stinted; and, indeed, that of the latter may be safely increased in quantity, without materially affecting the polish, and with manifest advantage as far as the softness and durability of the leather to which it is applied, is concerned. The manipulations required in the manufacture of both paste-blacking and liquid blacking, are essentially the same; the difference between the two articles, when the same materials are used, depending entirely on the quantity of liquid added. Thus, as noticed before, by diluting paste-blacking with water, vinegar, or beer-bottoms, it may be converted into liquid blacking of a nearly similar quality; and, by using less fluid matter, the ingredients of liquid blacking will produce paste-blacking. One thing must, however, be observed, and that is, that the ivory-black used for liquid blacking should be reduced to a much finer powder than for paste-blacking; as, if this is not attended to, it is apt to settle at the bottom, and to be with difficulty again diffused through the liquid. Persons who object to the use of blacking containing oil of vitriol, may employ formula I, 5, or II, 6 (*above*). The vitriol, however, greatly contributes to promote the shining properties of the blacking; and in small quantities, or in the proper proportion, is not so injurious to the leather as some persons have represented; as it wholly unites itself to the lime of the bone-phosphate contained in the ivory-black, and is thus neutralised, insoluble sulphate of lime, and an acid phosphate or superphosphate, being formed. It is the latter that gives the acidity to a well-made sample of blacking, and not the sul-

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should be gently rubbed through a sieve, held
blacking by one person, whilst another stirs the
densely with the spatula.

sometimes convenient to prepare liquid blacking
ry from a stock of 'paste-blacking' already on

final addition of the 3 *lbs.* of powdered gum,
n the formula of their liquid blacking, is not
d by the patentees; and we, therefore, presume
not intend it to be made. If made, it should
t end of the week, and the daily stirring must
continued for another week. This addition, or
enables us to produce two qualities from the
ade.

object here is to make the product as spongy and
ble, so that the purchaser may fancy he has
for his money.

[5] This is also to give bulk.

[6] A still more common article is vended in the north of England, and in Scotland, in which the oil is omitted altogether. *The sale of such blackings (?) is disreputable, when it is remembered that a really good article may be made for 2d. to 2½d. per lb.*

phuric acid originally added to it. In this way, the larger portion of the ivory-black is reduced to a state of extremely minute division, and with the other ingredients forms a strongly adhesive paste, which clings to the surface of the leather, and is susceptible of receiving a high polish by friction when in a scarcely dry state. This is the reason why lamp-black should never be employed for blacking to the exclusion of the necessary proportion of bone-black, as it has no earthy base to absorb or neutralise the acid, which, if left in a free state, would prove very hurtful to the leather. Oil of vitriol is now employed in the manufacture of all the more celebrated and expensive blackings; and that, simply because no other substance is known so efficient, and so little injurious to the leather. In the common blackings of Germany, hydrochloric acid is often used to the entire exclusion of oil of vitriol; but blacking so prepared possesses several disadvantages from which that of England is free. In the best German blackings only a small portion of this acid is used, as may be seen by reference to formula II, 5 (*above*). The addition of white-of-egg, isinglass, and similar articles[1] to blacking, always proves injurious, as they tend to stiffen the leather, and to make it crack, without at all improving its polishing properties. Even gum-arabic, in quantity, is on this account, objectionable. Oil has an opposite tendency, and, as already stated, the quantity commonly used may be increased with advantage. Resin oil should be particularly avoided.

Dr. Ure has recommended the use of a little copperas[2] in blacking; with the object, we presume, of striking a black with the tan in the leather; but except with new, or nearly new leather, this effect would not occur, whilst its presence, if not objectionable, would otherwise be useless.

The only *improvement* that has been introduced in the manufacture of blacking since the early days of the celebrated Day & Martin is, a few hours after the conclusion of the mixture of the ingredients, (but before adding the vinegar, if any) to simmer the whole very gently, for about 8 or 10 minutes, observing to stir it assiduously all the time. The fire must then be withdrawn, and the pan covered over until it is quite cold, when half an hour's lusty stirring will finish the process.[3] In this way a degree of maturity and
brilliancy will be imparted to t
which, without the application of h
take months to acquire, if, ind
reached it.

As it is generally more co
measure than to weigh liquids,
useful to remind the reader th
numbers,

1 gal. of *oil* weighs
1 „ *sour beer* „ 1
1 „ *vinegar* } „ 1
1 „ *water* }

We may here further remark tha
ings of different houses vary co
some of their properties; as als
even the same maker by age. So
dry off rapidly, and give a very b
with very little labour; whilst o
little longer to 'dry off,' and so
labour to polish them. The for
adapted to hasty use, and when
liant surface is desired; the latte
of polish, without extreme brillia
the wearer. The first best meets
ments of fashionable life; the
the middle classes and pedestrian
dirt, mud, and the various vicissit
velling and weather. To the on
'blackings' of Everett, Day & Ma
the other, those of Warren, Bry
and most of the smaller manufac
nearly all the paste-blacking of
respectable shops. Time, howev
the qualities of these two class
ings which are crude, moist, a
these properties, and become dri
brilliant by age. The practice
the first-class West-end boot and
is never to use a blacking which t
had in their stock at least a twel

Blacking, both liquid and pas
stored in a cool and moderately
and when in use should be ke
otherwise excluded from the air.
desiccation destroys most of its b

The present annual value of
consumed in the United Kingdom
at 562,500*l.*, or about 4½*d.* per
whole population; while the coll
value of that exported is about 3

[See BLACKING BALLS, BONE-
AND SHOES, LEATHER, SULPHUR
also *below.*]

Blacking, Automat'ic. *Syn.* S
BLACKING, SPAN'ISH JAPAN, &
Gum-arabic, 4 *oz.*; treacle or
sugar, 1½ *oz.*; good black ink, ½
vinegar, 2 *oz.*; rectified spirit
sweet oil, of each 1 *oz.*; dissolve
the ink, add the oil, and rub them
or shake them together for som
they are thoroughly united; t
vinegar, and lastly, the spirit.

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[1] In Scotland, flour-paste soured by keeping, is often substituted for part of the treacle in the common blackings; with the effect, however, of greatly impairing their polishing qualities, and causing the leather to rapidly become stiff, and to crack. Further, such blacking will not keep, often growing mouldy and hard in two or three weeks.

[2] The proportion recommended by Dr. Ure is ¼ *oz.* to each *lb.* of bone-black, dissolved in 10 parts of water, and to be added with the vitriol.

[3] A capacious enamelled cast-iron boiler, with a concave bottom, should be used for this purpose; in which case the ingredients can be mixed in it, and thus the trouble of *removal avoided. If a common copper or cast-iron boiler be employed, the blacking* must not be allowed to remain
in it longer than necessary to give it the '
conclusion of which it should be turned o
tub or vat to cool.

¼ oz.; indigo (in fine pow-
hem in a mortar, or basin,
h sufficient mucilage (made
. of gum in ¼ pint of strong
a thin paste; add very gra-
il, 1 oz.; and triturate until
plete, adding toward the end
ucilage; then further add of
d afterwards, successively, of
oz.; rectified spirit, 1 oz.;
se.

ites of 2 eggs with a table-
t of wine, 2 large lumps of
nd sufficient finely powdered
ive the required colour and
g excess.

re are chiefly used for dress
The first two are applied to
the tip of the finger, or a
allowed to dry out of the
l is commonly laid on with a
rush, and when almost dry or
its polish heightened with a
bber, after which it is left for
harden. It may also be used
faded black leather seats and
hairs. They all possess great
time; but are only adapted to
her, or indoor use. They should
the leather as thinly as possi-
e they soon crack off.

r'ness. Good glue or gelatine,
abic, 3 oz.; water, ¾ pint; dis-
add of treacle, 6 oz.; ivory-
fine powder), 5 oz.; and gently
h constant trituration, until of a
nce when cold; when nearly cold
ttles, and cork them down. For
may be warmed a little to thin
y. Does not resist the wet.

suet, 2 oz.; bees-wax (pure), 6
l of sugar candy (in fine powder),
soap, 2 oz.; lamp-black, 2½ oz.;
powder), ½ oz.; when thoroughly
further add of oil of turpentine,
pour it into pots or tins.

ax, 1 lb.; soft soap, 6 oz.; ivory-
Prussian blue, 1 oz.; (ground in)
oz.; oil of turpentine, ½ pint; to
, as before.

above are used by laying a very
on the leather, evenly spreading
surface, and then polishing it by
on with a brush, or a soft rubber.
are waterproof. Numerous com-
the class are vended by the sadlers
but the mass of them are unche-
res, badly prepared, and cause dis-
to those who use them. Such is
e with the products of the above
we may rely on the statements of
ave employed them for years. The
suitable for both harness and car-
r. See HEEL BALLS, &c.

R. *Syn.* VESI'CA, *L.*; VESSIE, *Fr.*;
Ger. In *anatomy*, &c., a thin membranous sac or bag, in an animal, serving as a receptacle for some secreted fluid; *appr.*, the urinary bladder. See CALCULUS, INFLAMMATION, RUPTURE, &c.

Bladd'ers. (In *commerce*.) The better qualities of these articles are prepared by cutting off the fat and loose membranes attached to them, and washing them first in a weak solution of chloride of lime, and afterwards in clear water; they are then blown out and submitted to strong pressure by rolling them under the arm, by which they become considerably larger; they are next blown quite tight, dried, and tied up in dozens. Commoner qualities are merely emptied, the loose fat removed, and then blown out, and strung up to dry.—Used chiefly by druggists and oilmen to tie over pots, bottles, and jars, and to contain pill-masses, hard extracts, and other similar substances; also in surgery, to cover wounds, sore heads, &c.—*Obs.* Bladders should never be purchased unless perfectly dry and air-tight; as, if the reverse be the case, they will neither keep nor prove useful, but will rapidly become rotten and evolve a most offensive odour. If purchased whilst damp, they should be at *once* hung up in a current of air, so as to dry as soon as possible.

BLAIN* (blāne). A boil; a sore; a pustule.

BLANC (blōng). [Fr.] In *cookery*, a dish which, according to Mrs. Rundell, is formed of grated bacon and suet, of each, 1 *lb.*; butter, ½ *lb.*; 2 lemons; 3 or 4 carrots (cut into dice); 3 or 4 onions; and a little water; the whole being simmered for a short time, with or without the addition of a glass of sherry or marsala, before serving.

BLANCH'ING. *Syn.* CANDICA'TIO, DEALBA'TIO, &c., L.; BLANCHIMENT, &c., Fr.; BLEICHEN, &c., Ger. A whitening, or making white; a growing white. In some cases it means decortication. See ALMONDS, BLEACHING, DECOLORATION, &c.

Blanching. In *cookery*, an operation intended to impart whiteness, plumpness, and softness, to joints of meat, poultry, tongues, palates, &c. It is usually performed by putting the articles into cold water, which is then gradually raised to the boiling-point, when they are at once taken out, plunged into cold water, and left there until quite cold. They are subsequently removed and wiped dry, ready for being dressed.

Obs. The operation of blanching meat, although it renders it more sightly according to the notions of fashionable life, at the same time lessens its nutritive qualities, by abstracting a portion of the soluble saline matter which it contains, especially the phosphates, and thus deprives it of one of the principal features which distinguish fresh meat from salted meat. Animal food, before being dressed, may be *washed or rinsed in cold* water without injury, *provided it be quickly* done; but it cannot be *soaked in water* at any temperature much below the boiling-point without the surface, and the parts near it, being rendered less nutritious. Washing meat when first received from the butcher is, indeed, a necessary act of cleanliness; but soaking it for some time in water is unnecessary, and for the reasons stated, should be avoided.

Strong acetic acid (concentrated vinegar) poured on or rubbed over hard lean meat, gradually renders it soft and gelatinous. Ordinary household vinegar has the same effect, but in a less degree. Tough meat thus treated for a short time before dressing it, becomes more tender and digestible, though somewhat less nutritious; whilst the taste and flavour of the vinegar is removed by the heat subsequently employed in dressing it.

BLANCMANGE'. (blo-mŏn*g*zh'‡). *Syn.* Blancmanger (blŏn*g*-mŏn*g*-zhā), Fr. *Literally*, white food; in *cookery*, a confected white jelly. It is commonly prepared by simmering 1 *oz.* of isinglass, 2 or 3 *oz.* of lump sugar, and a little flavouring,[1] in about a pint of milk, until the first is dissolved, when the whole is thrown into a jelly-bag, and the strained liquor is allowed to cool and solidify; it is next remelted by a gentle heat, and, when nearly cold, poured into moulds, which have been previously rubbed with a little salad oil and then wiped out again.

Obs. Good gelatine, or strong calves' feet jelly, is often substituted for the isinglass. At other times the jelly is made with about ½ pint of water (instead of milk), when ½ pint of almond-milk, or of cream, is added to the remelted jelly. Sometimes ground rice or arrow-root is employed in lieu of isinglass, when the product is called rice-blancmange, or West-Indian b., as the case may be. Transpa''rent blancmange[2] is merely clarified isinglass-jelly, flavoured. See Cream (Stone), Isinglass, and Jelly.

BLANQUETTE' (blan*g*-ket'). [Fr.] In *cookery*, a species of white fricasee. It is also the name of a delicate species of white wine, and of a particular sort of pear.

BLAST'ING. In *civil* and *military engineering*, the disruption of rocks, &c., by the explosion of gunpowder, or other like material.

BLAST'ING POWDERS (Melville and Callow's). *Prep.* 1. (Powder No. 1.) Chlorate of potassa, 2 parts; red sulphuret of arsenic, 1 part; to be separately carefully reduced to powder, and lightly mixed together, scrupulously avoiding the use of iron instruments, percussion, much friction, the slightest contact with acids, or exposure to heat.

2. (Powder No. 2.) Chlorate of potassa, 5 parts; red sulphuret of arsenic, 2 parts; ferrocyanide of potassium (prussiate of potash), 1 part; as No. 1.

3. (Powder No. 3.) Chlorate of
and ferrocyanide of potassium, equal

Obs. These compounds are not pe
injured by either salt or fresh wat
requiring to be dried to regain their
character. They possess fully eight
force of ordinary powder. One of
vantages, especially to the undergrou
is the very trifling amount of smoke
by their explosion. On the other
extreme facility with which they
attrition, contact with a strong ac
slight elevation of temperature, ren
unsuited to most of the purposes of
gunpowder. On this account they sh
be prepared in small quantities at a t
with the utmost caution. Mr. Cal
inventor of them, lost several of his
and was rendered a cripple for life, by
plosion of the kind referred to, which
only a few weeks after the sealing of his
A straw, or small strip of wood, only
wetted with oil of vitriol, and appli
small heap of the powder, produces
taneous explosion. See Gun-cotton,
powder, Mining, &c.

BLEACH'ING. (blēche'-). *Syn.*
ba'tio (-sh'o), Insola'tio,[3] &c., L.; Bl
ment, Blanchissage, Fr.; Bleich
The process by which the colour of
natural or acquired, is removed, and by
they are rendered white or colourless
more particularly applied to the decol
of textile filaments, and of cloths
them.

Hist. Bleaching is a very ancient
passages referring to it in the earlies
and profane writers fully testify. It
bably reached a high degree of
among the inhabitants of the first
empire, and was certainly practised
long before the commencement of
history. We may fairly assume
white linen formed part of the "
which, together with "jewels of
jewels of silver," and "precious
Abraham sent as presents to the
Rebecca and her family,[4] fully thr
ries and a half before the Exodus
quently, in Scripture, we have special
of "fine linen, white and clean." H
the earliest Greek historian, tells us,
Babylonians wore "white cloaks;"
Athenæus we read of "shining fine li
opposed to that which was "raw"
bleached.[6] At this early period, and
centuries afterwards, the operations
ing, fulling, and bleaching, were not d
separated. The common system of
followed by drying in the sun, adopte
ancients, is a process which of itself
quent repetition, decolorises the raw

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[1] This may be 5 or 6 bitter almonds (grated), or a little cinnamon, orange, or lemon peel, &c., at will. Sometimes these are omitted, and a little orange-flower water, rose-water, or essence of vanilla, added to the remelted jelly.

[2] *A misnomer of the confectioners and cooks.*

[3] Bleaching by exposure in the sun.

[4] *Gen.* xxiv, 53: B. C. 1857.

[5] Herod., i, 195.

[6] Athen., ix, 71.

b. They are tacked together endwise either by hand or a machine, so as to form one continuous piece of 300 to 350 yards in length, according to the weight of the cloth.

c. They are singed.[1]

d. They are crushed into a rope-like form by drawing them through a smooth aperture,[2] the surface of which is generally of glass or porcelain—the rope-form being given them to enable the water, and other liquids, to penetrate the goods more easily, and to allow them to be laid in loose coils in the kiers.

2. The pieces are bucked or boiled in milk of lime[3] for 12 to 14 hours,[4] followed by rinsing or cleansing in the washing-machine.

3. They are soured in water acidulated with hydrochloric acid,[5] and again washed; similar machines being employed for each.

4. They are bucked or boiled for 15 or 16 hours in a solution of resinate of soda,[6] and then washed as before.

5. They are chemicked by being laid in a wooden, stone, or slate cistern, when a solution of chloride of lime[7] is pumped over them, so as to run through the 'goods' into a vessel below, from which it is returned on them, by continued pumping, so that the cloth lies in it for 1 to 2 hours; it is then washed.

6. They are bucked or boiled, for 4 or 5 hours, in a solution of 1 *lb.* of crystallised carbonate of soda, dissolved in 5 galls. of water, to every 35 *lbs.* of cloth; and washed.

7. They are again 'chemicked,' as before; and washed.

8. They are soured in very dilute hydrochloric acid;[8] and then left on 'stillages'[9] for 5 or 6 hours.

9. They are, finally, thoroughly washed, well squeezed between rollers, dried over steam-heated tin-cylinders, starched or dressed, and finished.

This is the usual process for good calicos. Muslins, and other light goods, are handled rather more carefully; whilst for commoner ones, the sixth and seventh operations are generally omitted. The whole usually occupies 5 days; but by using Mr. Barlow's high-pressure steam kiers, it may be performed in two days. Yarns, &c., may be bleached in a similar manner by first looping th together.

Obs. According to the most relia rities, the strength of cotton-fibre is paired by its being boiled for two milk of lime, under ordinary pressu contact with the air; nor, according bleachers, even by sixteen hours boili strength of 40 *lbs.* per 100 galls. It that lime is less injurious than 'soda.'

Solution of caustic soda, sp. gr. 1 not injure it, even by boiling und pressure; but, in practice, soda-ash, bonate of soda, is used, and this on second bucking, and in the third, if one. The strength now never exceeds of the crystals to the 100 *galls.*, and is less.

Experiments have shown that imme 8 hours in a solution of chloride of li taining 3 *lbs.* to the 100 galls., follo souring in sulphuric acid of the sp. gr. or for 18 hours in acid of 1·025, do injure it.

By the improved method of pre treating the goods with lime or alkali chloride of lime is required. Indeed, it that where 300 *lbs.* were formerly u 30 to 40 *lbs.* only are now used. At th time it is right to mention, that th solution at ½° Twaddle is usually reg the best and safest strength, yet in bleach-works, particularly for inferior tender goods, this is greatly increased up to 5°, the period of immersion bei portionately reduced, as it is not safe to the goods long to the action of such solutions. With the higher streng are passed rapidly through the liqui calender, sufficient time only being to soak them thoroughly; then im through the acid or souring, fol washing as before.

In Scotland and Ireland the w generally performed by wash-stocks Lancashire, dash-wheels or washing with squeezers, are almost always us purpose.

Cotton loses about 1-20th of its bleaching.

II. BLEACHING of Linen:—*Line* bleached in a similar way to 'cotton, process is much more troublesome an owing to its greater affinity for the matter existing in it in the raw state the old system, several alternate with pearlash or potash and length posure on the field, with one or two and a final scrubbing with a strong soft soap, constituted the chief detai process. In this way a high degree o ness, though not an absolutely pure white, was ultimately produced. Gras ing or crofting is still extensively linen; but it is more generally emplo for a limited time, and in combinati

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[1] Generally on one side only; but for goods to be subsequently finely printed, on both sides. For very fine printing the nap is sometimes removed by shearing instead of 'singeing,' an ingenious and effective machine being employed for the purpose.

[2] Such apertures are also used instead of pulleys, in the transfer of the rope from place to place.

[3] The common proportions are about 1 lb. of quick-lime slaked and reduced to milk, with 2 galls. of water, for every 14 or 15 lbs. of cloth.

[4] This is done in a large iron boiler furnished with a perforated false bottom of wood, and technically termed a 'kier.'

[5] This dilute acid or acidulated water has usually the sp. gr. 1·010, or 2° Twaddle.

[6] Made with about 17 *lbs.* of soda-ash and 3 *lbs.* of resin, with water, 50 galls., to every 20 or 21 *lbs.* of cloth.

[7] Technically called 'chemick.' The strength of the solution is usually of the sp. gr. 1·0025, or ½° Twaddle.

[8] *Sp. gr.* 1·0125, or 2½° Twaddle.

[9] *Low stools or props to keep them from the ground.*

the system at present almost
pted for cotton goods; whilst,
:rofting is omitted altogether,
ing conducted wholly by the
The following *Tables* exhibit
the new system as at present
land and Scotland:—
sheetings:—
bucked for 12 or 15 hours in a
about 1 *lb.* of pearlash (or soda-
6 *lbs.* of cloth, and washed.
or about 2 days.
n milk of lime.
and the bucking continued,
ne and water being added; and

n dilute sulphuric acid at 2°

with soda-ash for about 10 hours,

as before.
again with soda-ash, as before.
for about 3 days.
ned, the white ones taken out,
rs again bucked and crofted.
d or simmered in a lye of soda-
only 2-3rds the former strength,

icked, for 2 hours, at ½° Twaddle,
scalded.
chemicked, as before.
ed for 4 hours, as in No. 5; washed,
d.
upies 13 to 15 days, according to
r.
hirtings, &c.:—As the preceding,
omewhat weaker solutions.
goods to be subsequently *printed*:—
ed in milk of lime for 10 or 12

ed in dilute hydrochloric acid of 2°
3 to 5 hours, and washed.
ked with resinate of soda for about
.
ds turned, reboiled as before, and

micked at ½° Tw., for 4 hours.
ured at 2° Tw., for 2 hours, and

cked with soda-ash for about 10 hours,
hed.
emicked as in No. 5.
ured, as at No. 6, for 3 hours; washed,
ed.[1]

The chief difficulty in bleaching linen
om the fact that its colouring matter
ible in acid or alkaline solutions until
een long acted upon by light, air, and
e, as in the common process of grass-
g. Chlorine hastens the operation;
fortunately, it can only be employed
the end of the process; as when earlier
he colour of the raw cloth becomes set, and irremovable. To obviate this difficulty Mr. F. M. Jennings, of Cork, has lately[2] introduced the joint use of an alkali and an alkaline hypochlorite (chloride) in the place of the ordinary chloride of lime. He prepares a bath of solution of soda at 5° Twaddle, which he raises by the addition of chloride of soda (or of potash) to 6 or 7°, and in this he steeps the cloth (after the first bucking and souring) for some hours, heat, or constant squeezing between rollers, being had recourse to, to facilitate the action. Souring and washing follow, when the goods are again put into the alkaline and chloride bath, as before; after which they are soured, and bucked again with soda. These last three operations are repeated until the cloth is almost white, when crofting for one half to one fourth the time required by the usual method renders it fit for the final bucking, and finishing. Indeed, it is said that if the process be very carefully managed it renders crofting unnecessary.

Raw linen loses about 1-3rd of its weight in bleaching.

III. **Silk**:—*Silk* is usually bleached by first steeping it, and then boiling it in solutions of white soap in water, after which it is subjected to repeated rinsings, a little indigo-blue, or archil, being added to the last water to give it a pearly appearance. When required to be very white (as for gloves, stockings, &c.), the goods are cautiously submitted, for 2 or 3 hours, to the action of the fumes of burning sulphur, and then finished by rinsing, as before.

Obs. Boiling or sulphuring is not required for the white silk of China. Raw silk loses from 4 to 5 *oz.* per *lb.* by bleaching.

IV. **Wool**:—In bleaching raw wool it is first deprived of the yolk or peculiar natural varnish with which it is covered. For this purpose it is steeped and stirred for about 20 minutes in rather warm water (135°—140° Fahr.), either with or without the addition of 1-4th part of stale urine; after which it is placed in baskets to drain, and soon afterwards thoroughly rinsed in a stream of water, when it is again allowed to drain, and is hung up to dry. The further operations depend on circumstances, wool being sometimes whitened in the fleece, or in the yarn, but still more frequently and extensively, not till woven. When it is intended to send it in the first two forms white to market, it is hung up or spread out, whilst still wet, and sulphured (see *below*); after which it is either at once rinsed for some time in cold water, or is previously treated with a very weak bath of soft soap.

In the case of woollen fabrics the operations of purifying or whitening the wool, beyond the removal of the yolk, are, for the most part, mixed up with the weaving and working of it. The pieces leave the hands of the weaver of a *dingy gray* colour, loaded with *oil, dirt, and dressing.* They then pass to the fulling-mill, where they are treated with fuller's earth and soap, often preceded with ammonia or stale urine, after each of which they are well washed out or scoured with cold water, and are then ready for the dyer. When it is intended to obtain them very white, or to dye them of a very delicate shade, they are commonly sulphured; after which they are washed or milled in cold water for some hours, a little finely ground indigo being added towards the end, to increase their whiteness; an addition also made when the cloth is sufficiently white without the sulphuring process.

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[1] strengths of the solutions, when *not otherwise*
s about the *same as those given under* COTTON

[2] *Patent* dated 1859.

The usual mode of SULPHURING woollen goods is to hang them up on pegs or rails, or, in the case of fleece-wool, to spread it about, at the upper part of a close, lofty room or chamber, called a sulphur-stove. In each corner of this room is set a cast-iron pot containing sulphur, which, after the introduction of the goods, is set on fire, when the door at the lower part of the chamber is shut tight and clayed. This is commonly done overnight; and by the morning the bleaching being finished, the goods are removed, washed, and azured.

Sulphuring, unless very skilfully managed, imparts a harsh feel to woollen goods, which is best removed by a very weak bath of soap-and-water (lukewarm); but the action of soap in part reproduces the previous yellowish-white tinge. Milling with cold, or luke warm water, tinged with indigo, is the best substitute.

Obs. Raw wool loses from 35 to 45% of its weight by scouring, and 1 to 2% more in the subsequent operations of the bleacher; the loss being in direct proportion to the fineness of the staple.

⁂ The above are the four principal applications of the art of bleaching; but, in technical language, the words bleaching, bleacher, bleachery, bleach-works, &c., when employed alone, are understood to have reference only to cotton and linen. This has arisen from the enormous extent of these manufactures, and from the process of bleaching them forming a business entirely distinct from that of weaving, dyeing, or printing them. The following, with the exception of the first, are of comparatively minor importance and interest:—

V. **Materials for Paper**:—Old rags for the manufacture of paper, and paper-pulp, are now almost universally bleached with chlorine or chloride of lime; the former being generally used in France, and the latter in England. The process usually consists in (1) boiling in an alkaline lye to remove grease and dirt, (2) washing, (3) pressing, (4) deviling or tearing up the pressed cake into fine shreds or pulp, (5) chemicking, with agitation, for about an hour, in a clear solution of chloride of lime,[1]
followed by (6) washing, (7) s
dilute hydrochloric acid at 1 or
treatment with a solution of so
or both, and (8) a final washing a
For the common kinds of paper, th
included in No. 7 are omitted; bu
whole of the lime-salt be remov
pulp, the paper made of it is li
brown and become rotten by ag
cases rags are bleached before b
and pulped. Cotton-waste is bl
similar way to rags.

In France, the chlorine, in a gas
passed from the generators into
cisterns containing the pulp, whic
must be fitted with close covers.

VI. **Printed Paper**, as ***Books***,
Maps, &c.—These when stained o
may be whitened by (1) wetting
pure clean water, (2) plunging
dilute solution of chloride of lime
them through water soured with
acid, and then (4) through pure
every trace of acid be removed.
may be further improved by furt
them into a weak solution of so
and again washing them, before f
them. It is only rare and valu
works or specimens of art that ar
treatment, which, owing to the ve
paper, requires considerable addre
In many cases a sufficient degree o
may be effected by simply expos
cles, previously slightly moistened,
of burning sulphur, followed by
through a vessel of pure water.

VII. **Straw, Straw-plait**, and a
of them, are, on the large s
bleached by (1) a hot steep or b
solution of caustic soda, or a str
soda-ash, followed (2) by washing
exposure to the fumes of burning
effect the last, the goods are su
close chamber connected with a s
which brimstone is kept burni
small scale, a large chest or box
employed. A piece of brick, or
iron heater, heated to dull rednes
the bottom of an iron crock or ea
few fragments of roll sulphur th
lid instantly closed, and the w
some hours. Care should be ta
inhaling the fumes, which are ver
as well as disagreeable and anno
goods are now also frequently ble
use of a weak solution of chlorid
of water strongly soured with o
even oil of vitriol, followed by
rinsing in clean water; but her

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[1] The 'strength' varies with the colour and quality of *the rags. From 2 to 4 lbs. per cwt.* of rags is a common *proportion; but for dyed* and printed rags as much as 7
or even 8 *lbs.* per *cwt.* are often employed
however, to prolong the process with a
than to hasten it by using the chloride in
rectangular cisterns of wood, or of slate
employed as the bleach-vessels. Ciste
brick-work lined with gutta percha or wit
men, are employed in some paper-mill
admirably.

a short time after sunset, and even by moonlight, and perhaps distinctly by bright candlelight; but after a short time this power is lost. It most frequently occurs in hot climates, and low latitudes at sea. Its chief causes are fatigue and exposure of the eyes to the glare of the tropical sun, probably coupled with gastric derangement. In some cases it is congenital, and is then generally incurable. The *treatment* consists in avoiding exciting causes, and endeavouring to restore the tone of the stomach, and the general health, by the usual methods. The eyes at the same time should be topically medicated by the frequent use of cold water, or mild astringent collyria. See Ophthalmia (Chronic).

BLIS′TER. *Syn.* Pap′ula, Pus′tula, L.; Pustule, Vessie, &c., Fr.; Blase, Blatter, Ger. A bladder or vesicle caused by the deposition of serous fluid between the cuticle and the derma or true skin, occasioned by the application of a vesicant, or by a burn, scald, or friction.

Blister. *Syn.* Vesicato″rium, L.; Epispastique, Vesicatoire, Fr.; Blasen-pflaster, B.-stoff, Ger. A substance which vesicates or raises blisters; in *pop. lang.*, a vesicating plaster or similar application.

The *use* of blisters is very ancient, and appears to date back long prior to the time of Hippocrates. Indeed, their value as cutaneous stimulants and counter-irritants appears to have been recognised by the medical faculty of all nations down to the present time. It is a principle sufficiently established with regard to the living system, that where a morbid action exists, it may often be removed by inducing an action of a different kind, as a state of excitement or irritation, in the same or a neighbouring part. In this way is explained the utility of blisters in local inflammation and spasmodic action, and it is this principle which regulates their application in pneumonia, gastritis, hepatitis, phrenitis, angina, rheumatism, colic, spasmodic affections of the stomach, &c.—diseases in which they are employed with the most marked advantage. A similar principle exists with respect to pain; exciting one pain often relieves another. Hence blisters frequently give relief in neuralgia, toothache, and other like painful affections. Lastly, blisters, by their operation, communicate a stimulus to the whole system, and raise the vigour of the circulation. Hence, in part, their utility in fevers of the typhoid kind, though in such cases they are used with still more advantage to obviate or remove local inflammation.

Blisters are commonly prepared with cantharides-plaster, or with some other preparation of cantharides; and, in the former case, usually have their surface sprinkled over with powdered Spanish fly; whilst the blistering surface is surrounded with a margin spread with common adhesive plaster, for the purpose of causing them to adhere to the part to which they are applied. In order to prevent the action of the cantharides upon th
membrane of the bladder, or urin
they are also often sprinkled with a l
dered camphor, or better still, are
with camphorated ether, which, on it
tion, leaves a thin layer of camph
surface; but care must be taken
layer be not too thick, as in that
plaster would not take effect. Wi
object, a piece of thin book-muslin
paper (silver-paper) is frequently
tween the blistering surface of the p
the skin; the efficacy of which ma
further heightened by first soaking t
or paper in olive or almond oil.

The usual time an ordinary blist
tharides-plaster is allowed to remain
with the skin is from 10 to 12 hou
then gently removed. The subsequ
ment depends on the object in view.
is not wished to maintain a discharg
blistered surface, the vesicle is cut
point of a pair of scissors at its most
part, to let out the fluid which it
followed by a dressing of spermacet
simple ointment; but when the cas
the blister to be kept open, or to be
into a perpetual blister, as it is
called, the whole of the detached
carefully removed with the scissor
part is dressed with either the oi
cantharides or of savine, at first, m
diluted with lard or simple ointmen
occasional dressing of resin cerate.
to Mr. Crowther, the blistered surf
kept clean by daily fomentation with w

Of late years, to obviate the
effects occasionally arising from th
blister, various compounds having c
for their base, as well as fabrics s
them, have been brought before t
These are noticed hereafter. See
Vesicants, &c.

Extempora″neous Blisters. A
best of these may be mentioned
lowing:—

1. A piece of lint dipped in the
vinegar of cantharides, and immedi
its application to the skin, covered
piece of strapping, or preferably a pi
gutta percha or oiled silk, to preve
tion. Raises a blister in from 5 to

2. Concentrated acetic acid, appl
same way, has a similar effect.

3. (Dr. Darcq.) Into a flat
pour from 8 to 10 drops of high
trated liquor of ammonia; cover
with a small piece of linen of
diameter than that of the glass, a
apply this little apparatus to the
shaved skin. The whole must be
place by means of moderate pressu
fingers, until a red ring, about 2
in breadth, is observed round the
it is certain that vesication is effect
times scarcely 30 seconds are ne

liquor, and add the juice of 3 large lemons; the next day filter, or decant the clear portion. Both the above should be kept in a cool place, otherwise they soon spoil. A little spirit of wine (3 or 4 fl. oz. to the pint) is sometimes added to them, to remove this objection. They are greatly inferior to the following:—

2. Carmine, ¼ oz.; strong liquor of ammonia (not weaker than ·900), 1 oz.; put them into a stoppered bottle, set it in a cool place, and occasionally agitate it for two or three days, to effect a solution; then add of rose-water, 1 pint; and, after admixture, further add of esprit de rose, ½ fl. oz.; pure rectified spirit, 1 fl. oz.; again well agitate, and set the whole aside for a week; lastly, decant the clear portion from the dregs (if any), for use or sale. Very fine. A cheaper article is made by omitting a portion of the carmine, and the whole of the esprit and spirit; and a still inferior one, by substituting 1½ oz. of silver-grain cochineal (in powder) for the carmine, with digestion for a week in the ammonia previously diluted with one half of the water.

BLOTE. To prepare or cure by drying and smoking; now only applied to fish.

BLO'TER. *Syn.* BLOAT'ER. A bloted fish; *appr.*, a herring slightly salted, and only very slightly dried and smoked.

BLOW'PIPE (blō'-). *Syn.* CHALUMEAU, Fr.; LÖTHROHR, Ger. An instrument by means of which the flame of a candle or lamp, or a gas-jet, is directed upon any substance placed to receive it, which is thus subjected to an intense heat. The blowpipe is to the artist, and the experimentalist, what the wind-furnace is to the artisan; but it is proportionately more powerful, convenient, and economical.

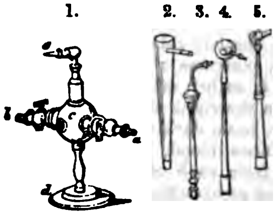
Beginners are usually unable to maintain a continued stream of air from the jet of this instrument, although the doing so is really a very simple affair. The operation merely depends on a little artifice in using it, which is more difficult to describe than to acquire. The effect intended to be produced is a continual stream of air for many minutes, if necessary, without interruption, even for an instant. This is done by simply applying the tongue to the roof of the mouth, so as to interrupt the communication between the mouth and the passage of the nostrils; by which means the operator is at liberty to breathe through the nose, at the same time that by the muscles of the lips he forces a continued stream of air from the anterior part of the mouth through the blowpipe. When the mouth begins to be empty it is replenished by the lungs in an instant, while the tongue is withdrawn from the roof of the mouth, and replaced again in the same manner as in pronouncing the monosyllable *tut*. In this way the stream of air may be continued for a long time without fatigue, provided the flame be not urged too impetuously; and even should *it be so urged no other* inconvenience will be felt than that of slight fatigue o
of the lips.

The hottest portion of the fl
by the action of the blowpi
tip of the outer white flam
also the property of rapidly bu
dising substances placed in it w
ceptible of such a change; an
commonly called the OXIDISING
interior blue flame is, for a like
the DEOXIDISING or REDUCING
possesses the property of extra
from most bodies capable of bein

Substances to be submitted to
the blowpipe-flame are placed
which is either a piece of charcoa
small spoon of platinum, gold, or
case may require. Sometimes a p
is used. Pine-wood charcoal is
this purpose; and the sides, no
the fibres, are presented to the f
a very intense heat is required, t
operated on should not exceed th
a peppercorn.

For producing extreme degre
flame is blown with a jet of ox
instrument being then called
BLOWPIPE; or a mixture of
hydrogen is burned, when it
OXY-HYDROGEN BLOWPIPE. Th
duced by the last is so great that
can stand exposure to it, even
fractory native compounds being
fused. Gold is volatilised, and
pidly consumed the instant it is
flame.

The principal varieties of the
general use are figured in th
below:—



1, Hemming's safety-jet for the oxy-hy
a, Pipe conveying oxygen gas.
b, ,, hydrogen gas.
c, Ball stuffed with fine wire-gauze.
e, Jet (internal diameter 1-80th of an
2, Black's blowpipe.
3, Bergman's ,,
4, Pepy's ,,
5, Wollaston's ,,
6, Oxy-hydrogen blowpipe.

Beside the above there are
varieties of the blowpipe occasiona
one, in which the air is expelled
sure of a column of water, and he
HYDROSTATIC BLOWPIPE; anoth
the flame is blown with the vapo
alcohol, is named the SPIRIT-BLO

Blowpipe, Herapath. For wel

for which directions are given are of a miscellaneous and less usual character.

Az'ure, *Syn.* *Azure Blue.* A name frequently given to smalts. That of the oil-painter is ultramarine, that of the ancients is noticed below. See AZURE (p. 165), ULTRAMARINE, &c.

Barth's Blue. See SULPHATE OF INDIGO.

Berlin'-Blue. Prussian blue.

Blue Bice. Native blue carbonate of copper, prepared by grinding and elutriation. That of the shops is generally a factitious compound made from smalts.

Blue Carmine. See CARMINE and SULPHATE OF INDIGO.

Char'coal-Blue. Carbonised vine-stalks are triturated with an equal weight of salt of tartar or pearlash, the mixture put into a crucible, and heated over the fire until it ceases to swell, the mass being kept well stirred all the time; when cold, it is dissolved in water, and the excess of alkali saturated with dilute sulphuric acid. The liquid becomes blue, and a dark precipitate falls down, which turns of a brilliant blue colour when dried and cautiously heated.

Chi'na-Blue, *Syn.* *Roy'al Smalts.* The crude oxide of cobalt, or zaffre, is ground with an equal weight of potash, and about eight times its weight of felspar, the mixture submitted to fusion in a crucible, and when cold reduced to an impalpable powder. *Used* to paint pottery, and as a blue pigment.

Co'balt-Blue, *Syn.* *Cobalt'ic Az'ure.* This is commonly prepared by one or other of the following formulæ:—

1. Zaffre, 1 lb., is dissolved in nitric acid (diluted with an equal weight of water), ¾ lb., by digestion for some hours; the solution is evaporated nearly to dryness, and the residuum redissolved in warm water; to this solution, after filtration, a solution of phosphate of soda is added as long as a precipitate forms; this last is collected on a filter, washed with cold water, and mixed, whilst still moist, with 8 times its weight of fresh-precipitated hydrate of alumina; the paste is then dried, and exposed to a cherry-red heat in a crucible, after which the mass is cooled and reduced to a very fine powder.

2. A solution of nitrate of cobalt is precipitated with ammonia-alum, and the precipitate washed, dried, and exposed to a cherry-red heat, as before. The products of the above formulæ are very beautiful and permanent. See COBALTO-ULTRAMARINE.

Egyp'tian Az'ure, *Alexan'drian Frit, Azure of the Ancients.* A mixture of carbonate of soda, 1 *lb.;* calcined flints, 1½ *lb.;* copper filings, ¼ *lb.;* (all in fine powder;) fused together in a crucible for 2 or 3 hours, and when cold, reduced to an impalpable powder. A beautiful and unchangeable sky-blue colour. *Used* in both oil and fresco painting; and as a substitute for smalts, of which, indeed, it is a *variety.*

In'digo (which *see*).

I'ron-Blue, *Fer'ric Blue.* Ordi
phate of iron prepared by precipitati
tion of protosulphate of iron with
phosphate of soda, the resulting pow
washed, and dried at a gentle heat.
sky-blue colour, but without much
body.

Blue Lake. See LAKES and SUL
INDIGO.

Molybde'num-Blue. From sulph
molybdenum, dissolved in nitric acid,
tin filings and a little muriatic acid
After digestion for some time, the cle
is poured off, and evaporated to dryn
resulting powder is then mixed with
hydrate of alumina (as in making coba
heated to a very dull red, and whe
again become cold, reduced to powder.
both as a paint and an enamel-colour.

Moun'tain-Blue. Native carbonate of
mixed with more or less earthy matter,
to fine powder. That of the shops
factitious.

Par'is-Blue. Prussian blue.

Pow'der-Blue. Smalts.

Prus"sian Blue (which *see*).

Queen's Blue. See STONE-BLUE (*belo*

San'der's Blue. Ultramarine-ashes.

Sax'on Blue, *Saxon Az'ure.* A comp
hydrate of alumina and Prussian bl
pared as follows:—

1. To sulphate of iron, 1 *oz.;* and
8 *oz.;* dissolved in water, 1 gal.; add,
taneously, separate solutions of pruss
potash and common pearlash, until the
to produce a precipitate; after repose
the deposit, wash it well with water,
it.

2. A solution of sulphate of iron is p
tated with another of prussiate of pota
instantly mixed with the precipitate
has just been obtained by treating a
tion of alum with a solution of pearla
mixed precipitates being finally treat
before.

Smalts (which *see;* also CHINA-BLU
EGYPTIAN AZURE, *above*).

Thénard's Blue. See ULTRAMARIN
baltic).

Thumb'-Blue, *Cake'-blue, Crown'-Blu
blue, Knob'-blue, Meck'lenburg-blue*
Queen's blue, Stone-blue, &c. Names gi
the lump-blue used in laundries, whi
according to the quality and the pa
form given to it.

Prep. 1. A mixture of powdered star
sufficient indigo (in impalpable pow
give the necessary colour, made into
dough with starch-paste, and then form
lumps or cakes of the desired size and
and dried. This forms the ordinary '
woman's blue' of the shops.

2. As the last, but substituting
sulphate of potassa or blue carmine[1]

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[1] See INDIGO (Sulphate of).

this name is given, is made from sawdust, which, under the influence of a high temperature and the enormous pressure of 600 tons, acquires a degree of hardness very much exceeding that of ordinary wood. It has a very fine grain, and is unaffected by atmospherical variations; but its principal merit is its adaptation to moulding, so that by the most economical processes, forms and impressions are given to it which it would require, in any other way, considerable labour and workmanship.

BOLAS. Sweet light cakes which, according to Mrs. Rundle, are prepared as follows:—Into flour, 2 lbs., pour of warm milk, ½ pint, a small teacupful of yeast, and 6 eggs; make a dough, add of butter, 1 lb. (by degrees), and set it in a warm place to rise for an hour; then mix in of powdered sugar, 1 lb.; and make the mass into cakes; put these into cups or tins previously well buttered, and ornament the top with candied orange or lemon peel; lastly bake them. See CAKES.

BOLE. *Syn.* BO'LUS, L.; TERRE BOLAIRE, &c., Fr. The name of several argillaceous minerals, varying in colour from white to yellow, red, and brown, which they owe chiefly to iron. See OCHRES and RED and BROWN PIGMENTS.

BOLOG'NA PHI'AL (-lawn'-yă). See PHIALS.

BO'LUS. [L., Eng.] *Syn.* BOL, Fr. Boluses, in *pharmacy* and *medicine*, are small, roundish masses of medicinal substances, which are taken in the same manner as pills, which they resemble, except in their larger size. Those persons who object to swallowing them in their common state, may wrap them in soft paper, or introduce them into the emptied husks of raisins or grapes.

Boluses (bo'lī, L.) are prepared with the same ingredients, and in a similar manner to pills (which *see*).

BON'-BON (bōng'-bōng). [Fr.] A sugar-plum. See CONFECTIONERY and SUGAR-PLUMS.

BONE. *Syn.* OS, L., Fr.; BEIN, KNOCHEN, Ger.; BÁN, Sax. The hard substance forming the interior skeleton of animals, or any single part of it.

Comp. According to Berzelius:—

	Human bones.	Ox bones.
Animal matter soluble in boiling water	32·17	33·30
Vascular substance	1·13	
Triphosphate of calcium, with a little fluoride of calcium	53·04	57·35
Carbonate of calcium	11·30	3·85
Phosphate of magnesium	1·16	2·05
Chloride of sodium and other salts	1·20	3·45
	100·	100·

The soluble animal matter is chiefly fat and gelatine.

Uses, &c. The bones of animals are employed for various purposes in the arts, manufactures, and domestic economy
good meat form most excellent
making soups and gravies, as is
every cook. In France, soup i
made by subjecting bruised bon
heat of 2 or 3 days' continuance.
the same is commonly effected
Papin's digester. When the eart
a bone is dissolved out by dige
large quantity of very dilute hydr
a lump of gelatine is obtained,
being well washed with water,
isinglass for all the purposes of
and jellies. The following is
recommended by Proust for mak
of bones, in hospitals, gaols, and
lishments:—

The bones, crushed small, are
for 15 minutes in a kettle of w
fat (which is fit for all comm
skimmed off, as soon as cold.
then to be ground, and boiled in
their weight of water (of which
used must form a part), until
wasted, when a very nutritious
obtained. Iron vessels should a
in this process, as the jelly and s
copper, brass, and the other com
The bones of fresh meat are t
ductive; those of boiled meat com
those of roasted meat scarcely aff
As 'boning' meat before cookin
very general practice, a quantity o
may always be obtained.

Bones are, for the most part
TURNED, BLEACHED, and DYED,
manner to ivory; but with less c
their inexpensive and coarser cha
fore being submitted to any of the
they are, however, first submit
boiling, to deprive them of grease

The bones of living animals may
mixing madder with their food.
young pigeons may thus be ting
colour in 24 hours, and of a deep
days; but the bones of adult ani
fortnight to acquire even a rose
bones nearest the heart become
soonest. In the same way extract
tinges the bones of young pig
See BLEACHING, DYEING, IVORY,

BONE'-ASH. Impure triphosp
cium, obtained by calcining bones
and reducing the ash to fine powd
make pure phosphate of calcium,
pels, &c.; also sold for burnt hart

BONE'-DUST. *Syn.* BONE-MAN
(previously boiled for their greas
different degrees of coarseness, in
is sowed along with the seed in a
thus treated, is said to yield 30 to
more weight in straw and grain
common methods. Turnip, and
soils, it renders more than ord
ductive. Bone manure is much
west of Yorkshire, Holderness,

glazed or varnished calico), cut by a pattern to the proper size, is passed rapidly between the engraved cylinders of a rolling-press, by which the design is given to it. Paste is now applied to each piece of cloth, which is then placed over the volume previously prepared to receive it. In many cases the covers are prepared separately before being embossed, and are afterwards fastened in the finished state to the book by means of a piece of canvas or calico previously affixed to its back for the purpose, when all that is required is to paste the ends of it to the inside of the boards, with the last blank leaf over it. Books in cloth are seldom cut at the edges, unless they are otherwise highly finished.

HALF-BINDING. Books forwarded in boards, and finished with leather backs and corners, are said to be 'half-bound.'

LEATHER-BINDING. A book is only said to be 'bound,' or 'fully bound,' when both its back and sides are wholly covered with one piece of leather.—The leather is wetted by immersion in water, wrung or squeezed, stretched on a smooth board, cut to the proper size, pared thin on the edges, and covered with paste. It is then applied to the book (previously forwarded in boards, and cut), drawn tightly over it, turned down on the inside, rubbed smooth with a folding-stick, and otherwised adjusted; after which it is placed in some suitable situation, at a distance from a fire, to dry.

Rough calf requires to be damped on the grain side with a sponge and water before pasting and covering.

Russia-leather is well soaked in water for an hour, taken out, beaten, and rubbed; after which the paste is well worked into the flesh side before covering.

Morocco is first 'grained' by rubbing it on a board, with the grain side inside, and, after being pasted, left to soak for about a quarter of an hour; after which it is drawn on with a piece of woollen cloth, to preserve the grain.

Roan is either soaked in water, or left to soak when pasted.

SCHOOL-BINDING. Originally applied to school-books strongly sewn and 'done up' in sheep-skin, which was either left of a plain brown, or sprinkled or marbled with copperas-water. Similar works of a cheaper class, are now often 'done up' in canvas, brown-holland, and even coarse and strong coloured glazed calico.

Concluding remarks. Numerous patents for improvements in binding books, several of which possess very great merit and usefulness, have been obtained during the last 30 years. Among these, one known as 'Hancock's Patent Binding,' from its extreme novelty, simplicity, durability, and inexpensiveness, deserves a passing notice here. By Mr. Wm. Hancock's method the sheets are folded in double leaves, and being properly placed together and adjusted (by setting them vertically, with the
edges forming the back of th
wards, in a concave mould so form
giving shape it may leave the
and nearly the whole length
firmly secured by a few turns
the book is subjected to the act
and a strong and quick-drying s
rubber is smeared over the back
when the whole is left for 3
longer, to dry. The operation
often as necessary, after which
are cemented on with the same v
book is ready to have the bo
The sheets of books that canno
'double leaves' may be str
through, separately, before adju
the mould. In this way, severa
operations of binding are dispen
most willingly bear testimony t
and durability of this method, a
great convenience it affords in
books to open perfectly flat upo
be distorted in any possible m
injury to their backs. It is, un
best way of binding books for t
Editor of the last edition of this
a large trunk of books, among w
sive volume bound on Hancock's
rest were nearly torn to pieces by
journey, but this one remained
after five years, during which
panied him in his travels, exte
tively, to upwards of 23,000

GILDING, MARBLING, SPRINKL

BOOTS and SHOES. The clea
and shoes forms no unimporta
domestic duties of a large esta
on it being properly performed
their appearance and durability.
St. Crispin, in whom we plac
reliance, assures us, that to eff
in the best style, all that is
employ very little blacking (me
moisten the surface of the le
brush it off whilst still damp.
the surface wet, nor allow the b
before applying the polishing br
purpose, a portion only of the
should be attended to at a time.
of course, to be carefully brus
applying the blacking. When i
restore the shape of a boot or
to clean it, boot trees may be
brushes, we are told that there
least three—one (dirt-brush)
stiff, but not wiry nor scratc
mud and dirt; another (blackin
fine, flexible hair, and plenty of i
the blacking; and a third (po
covered with long, fine, spring
stiff hair, for giving the polish.
ment of inferior or worn-out b
to be false economy, and prov
destructive to the lighter classes

The occasional use of a little
the uppers of boots and shoes,

either by purifying native borate of soda (TINC'AL, TINC'AR), or by saturating crude boracic acid with the alkali. It is never prepared on the small scale unless for chemical analysis.

Prop. Crystals, six-sided prisms, which contain 10 equiv. of water, and effloresce in dry air; soluble in 20 parts of cold, and in 6 parts of boiling water; solution has an alkaline reaction on test-paper; by heat it loses its water of crystallisation, and at a higher temperature fuses to a glass-like substance (see *below*).

Pur. This may be ascertained by determining the quantity of sulphuric acid required to neutralise a given weight of the sample under examination, as indicated by litmus paper. Common salt and alum are frequently mixed with borax to lower the value. The first may be detected by a solution in hot water giving a curdy-white precipitate with nitrate of silver, soluble in ammonia; the last, by water of ammonia, giving a bulky-white pulverulent precipitate. The former must be distinguished from the white pulverulent precipitate of borate of silver, which is thrown down from pure borax.

Uses, &c. Borax is extensively employed as a flux for metals, for soldering, and in medicine. Internally, it is diuretic, sedative, emmenagogue, and refrigerant, in doses of 15 to 40 grs.; externally, made into a gargle for sore throat, and in powder as a detergent in aphthæ, and ulcerations of the mouth. Dissolved in *rose-water*, it is used as a *cosmetic;* and mixed with about 8 times its weight of lard, forms a useful ointment in piles and sore nipples.

Borax, Glass of. Borax dried at a gentle heat, and then melted by increasing the heat until it forms a vitreous mass on being cooled. *Used* in soldering, and as a flux, particularly in blowpipe experiments.

BO'RIC ACID. See BORACIC ACID.

BORIC ANHYDRIDE. B_2O_3. *Syn.* ANHYDROUS BORACIC ACID, BORACIC ANHYDRIDE, BORIC OXIDE. The only known oxide of boron. It can be produced by burning boron in oxygen, in the air, or in nitrous oxide, but is most easily and economically prepared by strongly heating boracic acid so as to deprive it of water. It is a brittle vitreous solid, not volatilised by heat except in the presence of water. Dissolves in water, forming boracic acid. Its alcoholic solution burns with a green flame, like that of boracic acid.

BO'RON. B. The base of boracic acid. It was discovered by Homberg in 1702; but, from attracting little notice, was soon forgotten. It was rediscovered almost simultaneously, by Sir H. Davy, and by Gay-Lussac and Thénard, in 1807-8.

Prep. Boron is prepared by a process similar to that employed to obtain silicium:—*Potassium* and *perfectly dry boracic acid*, or, *preferably, boro-fluoride of potassium*, intimately mixed together, are placed i adopter-tube, and submitted to a low When cold, the loose cork that f mouth is removed, and hot water in successive portions, until the wh is detached and all its soluble portion the liquid is next allowed to settl precipitate washed first with a solu ammoniac, and afterwards with alc residuum (boron) is lastly dried in and put into a well-stoppered phial.

Prop., &c. A solid, tasteless, and powder, of a dark grayish-brown colo sulphur it unites at high temperatu ing sulphurets (sulphides of boron); placed in chlorine gas it spontan flames, and a gaseous chloride of formed. The compounds of bo simple bodies are termed BO"RIDES BO"RURETS*.

Obs. Among the most remarkab recent discoveries in chemistry, are MM. Wohler and Deville, relative to boron. Each of these substances is no to exist in three very different st logous to the three known states o namely, charcoal, graphite, and diam last of these states is, of course, the teresting. Crystallised boron pos hardness, brightness, and refractiv comparable to those of the diamond; in chlorine, without residue, and cumstances resembling those of the tion of diamond in oxygen; it is not by any of the acids, and appears to least alterable of all the simple bod powder is already used in the arts, in diamond-dust; and it seems not im that, when obtained by the chemist in of a larger size, it may rival even the as a gem.

Boron, Terflu'oride of. See FL ACID.

BOTT'LES (bŏt'lz). See GLASS, I LACTATION, PHIALS, PHOSPHORUS, &c

BOTT'LING (bŏt'l-ĭng). See CORK LIQUORS, WINE, &c.

BOUGIE (bōō'-zhē). [Fr.] *Syn.* C CERE'OLUS,[1] CANDE'LA PROBATO"RIA*, *surgery*, a long slender instrument, of wax,[2] introduced into the urethra, gus, or rectum, in stricture and other of those organs.

Prep. 1. (Prof. Pickel's.) Amber 1 part; boiled oil, 3 parts; mix, coo and further add of oil of turpentine spread the mixture, at 3 successive upon loose spun-silk cord or web; heat of 150° Fahr., and repeat the until the instrument has acquired size; lastly, polish it, first with pum and afterwards with tripoli and oil. the original receipt of the once French professor Pickel, and is still

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[1] Properly, a 'little bougie.'

[2] Hence the name.

(scalded and finely chopped), and the yelk of an egg, and fried, they make excellent cakes, fritters, &c."

BRAN. *Syn.* FUR'FUR, L.; BRAN, SON, Fr.; KLEIE, Ger. The inner husk or proper coat of the cereal grains, sifted from the flour; appr., that of wheat. *Comp.* 100 parts of bran contain albuminoid bodies, 13·80; oil, 5·56; starch, fibre, &c., 61·67; ash, 6·11; water, 12·85.

Uses, &c. The bran of wheat, diffused through hot water, is largely employed by the calico-printers to remove the colouring matter from those parts of their goods which are not mordanted. A handful mixed with a pail of warm water forms an excellent emollient foot-bath. Infused in hot water (bran-tea), and sweetened, it forms a popular demulcent, much used in coughs and hoarseness, and which, taken in quantity, proves gently laxative. It also forms an excellent manure, and, from containing the ammoniaco-magnesian phosphate, is especially adapted as a 'dressing' for potatoes. It is frequently mixed with flour, and made into bread (bran-bread), which is eaten by the poorer orders for economy, and by the higher classes because it is recommended by the faculty as being more wholesome than white wheaten-bread.

BRAN'DY. *Syn.* SPIR'ITUS GAL'LICUS, S. VI'NI GAL'LICI (-SI; B. P.), A'QUA VI'TÆ†*, L.; EAU-DE-VIE, Fr.; BRANNTWEIN, COGNAC, Ger.; BRAN'DYWINE†. A well-known spirituous liquor obtained by the distillation of the wine of grapes. The name is also often, though improperly, given to the spirit distilled from other liquors, and particularly from the fermented juice of fruits; but in this case, usually with some qualifying epithet.

When first distilled, brandy, like other spirituous liquors, is colourless (WHITE BRANDY), and continues so if kept in glass or stoneware; but if stored in new oak casks, as is usually the case, it gradually acquires a yellowish tint from the wood (PALE BRANDY). The deep colour that this spirit frequently possesses when it reaches the consumer, is imparted to it by the addition of a little *burnt sugar* (caramel). *Catechu*, or terra japonica, in powder or solution, is also sometimes added to give a roughness to the spirit. The original intention was merely to imitate the appearance acquired by brandy from great age, when kept in wood; but in process of time the thing has come to be overdone. The natural colour which the spirit receives from the cask, however long it may be kept in it, never exceeds a light amber tint, about equal to that of pale Jamaica rum. Nothing, however, will now please the public taste but a spirit of lively and full 'brandy-colour,' as it is called. The consequence is, that more colouring is commonly added than is compatible with a rich appearance or a very fine flavour.

The brandies most esteemed in England are *imported from France*, and are those of Cognac
and Armagnac, the preference bei
given to the former. The bra
chelle and Bordeaux come next
while those obtained from Portug
Italy, are very inferior.

The *constituents* of pure brand
and water, together with small
a volatile oil, acetic acid, acetic
thic ether, colouring matter, and
is from the presence of the two e
spirit derives its characteristic
vour. The amount of absolut
brandy varies from 45 to 55 per
first imported, it is generally 1 or
but its strength decreases by ag
time it is taken from the bond
sale, it is seldom stronger than
proof. Pure brandies of the best
when new, seldom exceed proof, a
rally a little below it. The reas
that they are but slightly rectifie
lation tends to injure the ether
which the flavour of the brandy d

The quality and flavour of th
ported from France vary, and oft
bly, from that which is drunk
tables on the Continent; this prin
from it being prepared, or, as it i
termed, 'made up,' for the Lon
which means *lowering it* by the
plain spirit, colouring, &c. Thi
any extent desired by the Englis
and the quantity and prices of th
so added are regularly set out in
The strength at which foreign b
in England varies from proof t
proof. In large quantities, and
the strength, of course, depends
the age and quality of the spiri
brandy being, perhaps, 15 or 1
one of the last year's vintage, of
quality, may be as strong as 2 u.
u. p. These matters are famil
experienced brandy dealer.

In *France* there are several
brandy, which are known by n
tive of their qualities, source, and

"*Eau-de-vie supérieure*" is o
pale white wines by skilful distil
remarkable for its rich and del
It forms the finest variety of Co
both 'white' and 'pale,' of
drinker, being seldom artificially
deepest tint, though long kept i
exceeds a pale amber; and hen
thus coloured, it is frequently
brandy' by the uninitiated.

"*Eau-de-vie ordinaire*," or *co*
is distilled from inferior or spoilt
wines; average sp. gr. about 0·9
to 27 u. p.). It forms the 'ordi
of the taverns and hotels; and
'made up' with plain spirit to
very large portion of that which

Of each of the above variet
numerous degrees of qualities,

days, when it is fit for use. Strength of mixture, 22 u. p.

A liqueur, sold in London under the name of "brandy improver," or "brandy essence," consists of a thin sugar syrup, flavoured with acetic ether and essence of cayenne, and coloured with burnt sugar. It is said to heighten the true Cognac flavour, and restore lost alcoholic strength.

Brandy, British. *Syn.* MALT BRANDY, &c. For a long time this liquor was distilled from spoiled wine and the dregs of wine, both British and foreign, mixed with beer-bottoms, spoiled raisins, and similar substances. Malt and molasses spirit were afterwards employed, as at the present day, for the purpose; but it was long considered as "an unpardonable and wicked misuse of these articles." Modern experience, however, has proved that pure malt spirit is, in this country, the most convenient, if not the best kind, to form the basis of an imitation brandy.

Prep. 1. To 12 galls. of *malt spirit* (finest and flavourless), at proof, add, of *water*, 5 galls.; *crude red tartar* or *wine-stone*, ¾ lb. (previously dissolved in 1 gal. of *boiling water*); *acetic ether*, 6 fl. oz.; *French wine-vinegar*, 2 quarts; *French plums* (bruised), 5 lbs.; *sherry wine-bottoms*, ¼ gal.; mix in a sherry or French-brandy cask, and let them stand for about a month, frequently 'rummaging up' the liquor with a stick; next draw over 15 galls. of the mixture from a still furnished with an agitator. Put the 'rectified spirit' into a clean, fresh-emptied Cognac-brandy cask, and add of *tincture of catechu*, 1 pint; oak shavings, 1 lb.; and *spirit colouring*, ½ pint; agitate occasionally for a few days, and then let it repose for a week, when it will be fit for use. *Prod.*, 15 galls. of BRANDY, 17 u. p. Age greatly improves it.

2. *Malt spirit* (as before), 99 galls.; *red tartar* (dissolved), 7 lbs.; *acetic ether*, ½ gall.; *wine-vinegar*, 5 galls.; *bruised raisins* or *French plums*, 14 lbs.; *bitter-almond cake* (bruised and steeped for twenty-four hours in twice its weight of water, which must be used with it), ½ lb.; *water*, q. s.; macerate as before, and draw over, with a quick fire, 120 galls. To the distilled spirit add a few lbs. of *oak shavings*; 2 lbs. of *powdered catechu* (made into a paste with hot water), and *spirit-colouring*, q. s.; and 'finish' as in the last. *Prod.*, 120 galls. of spirit, fully 17 u. p. Equal in quality to the last.

3. *Clean spirit* (17 u. p.), 100 galls.; *nitrous ether*, 2 quarts; *cassia buds* (ground) 4 oz.; *bitter-almond meal*, 5 oz.; *orris-root* (sliced), 6 oz.; *powdered cloves*, 1 oz.; *capsicum*, 1½ oz.; *good vinegar*, 3 galls.; *brandy colouring*, 3 pints; *powdered catechu*, 2 lbs.; *full-flavoured Jamaica rum*, 2 galls. Mix in an empty Cognac 'piece,' and macerate for a fortnight, with occasional stirring. *Prod.*, 106 galls., at 21 or 22 u. p.

4. *Malt spirit* (17 u. p.), 100 galls.; *catechu*,
2 lbs.; *tincture of vanilla*, ½ pint;
colouring, 1 quart; *good rum*, 3 galls.
or *nitrous ether*, 2 quarts. Mix as the

5. *Clean spirit* (17 u. p.), 89
flavoured Cognac, 10 galls.; *oil of*
drs.; *oil of bitter almonds*, 3 drs.;
catechu, 1 lb.; *cream of tartar*,
1½ lb.; *Beaufoy's concentrated*
gal.; *sugar colouring*, 2 to 3 pints;
1 gal. When the above mixtures are
the French brandy, colouring, and
should be added to the distilled spirit.

6. To *plain spirit* (coloured), at
add a little *tincture of catechu*, and
cient quantity of *eau-de-vie de marc*,
oil distilled from wine-lees, to flavour

Obs. The oil referred to in the last
is obtained by distillation from the
wine, either dried and made up into
in their wet state, mixed with about
times their weight of water. This oil
be kept dissolved in alcohol, as it is
apt to lose its flavour. Brandy
part of the world may be very closely
by distilling the oil from the lees of the
produced in that particular district.
black tea is cheap, as in the United
of America, it is very commonly
impart the roughness of brandy to the
spirit, and the subsequent addition of
'flavouring' greatly improves it. A
good article of cider-spirit thus treated
a passable 'mock brandy.' In
may remark that, as the strength and
of ingredients frequently vary, and
depends greatly on skill in
much must be left to the experience,
ment, and discretion of the operator.
cases he must recollect that a certain
of 'age' is absolutely necessary to give
character to any spirit. Indeed, to age
one case, and its absence in the other,
be referred the reasons why French
and British brandy, apart from mere
of flavour, so materially differ.

The production of a flavoured British
closely resembling French brandy is a
well worthy of the attention of the
chemist, rectifier, and cellarman, as a
of profit; and of the amateur, as
interesting field for useful and
periment.

Brandy, Car'away. A species of
commonly prepared as follows:—1.
seeds (bruised), 4 oz.; *lump sugar*, 2
British brandy, 1 gal.; macerate a
occasionally shaking the bottle.—2.
1 lb.; *caraways* (bruised), 1 oz.; 3
almonds (grated); *spirit-colouring*, 1
plain spirit or *gin* (22 u. p.), ½ gal.; as
Some persons omit the colouring.

Brandy, Cher'ry. *Prep.* 1. Brandy
cherries (crushed), of each, 1 gal.; let
lie together for 3 days, then express
liquor, and add 2 lbs. of lump sugar; in a
or two, decant the clear portion for use.

d. Yellow Brass. See Fine Brass (*above*).

e. Button-brass:—1. *Copper,* 8 parts; *zinc,* 5 parts. This is the 'platin' of the Birmingham makers.

2. *Yellow brass,* 16 parts; *zinc,* 2 parts; *tin,* 1 part. Paler than the last.

3. *Copper,* 25 parts; *zinc,* 20 parts; *lead,* 3 parts; *tin,* 2 parts. Pale; used for common buttons.

f. For fine Castings:—1. As *fine brass,* according to the colour desired. (See *above.*)

2. *Copper,* 62 parts; *zinc,* 35 parts; *lead,* 2 parts; *tin,* 1 part.

3. *Copper,* 60 parts; *zinc,* 36 parts; *tin,* 4 parts. Both the last two are rather pale and brittle.

4. *Copper,* 90 parts; *zinc,* 7 parts; *tin,* 2 parts; *lead,* 1 part. Rich deep colour.

5. *Copper,* 91 parts; *zinc,* 5 parts; *tin,* 3 parts; *lead,* 1 part; as the last.

g. For Gilding:—1. As *fine brass* (*above*).

2. *Copper,* 64 parts; *zinc,* 32 parts; *lead,* 3 parts; *tin,* 1 part.

3. *Copper,* 82 parts; *zinc,* 18 parts; *tin,* 3 parts; *lead,* 1 part.

h. For Solder:—1. *Fine brass,* 12 parts; *zinc,* 6 parts; *tin,* 1 part; melted together.

2. *Brass,* 2 parts; *zinc,* 1 part; as before.

3. *Brass,* 3 parts; *zinc,* 1 part. Very strong. *Used* for soldering tubes and other like purposes requiring great strength. The above alloys form the 'hard solder' of the braziers. For certain purposes a little silver is added to them, when the compound receives the name of 'silver-solder.'

i. For Turning:—1. *Fine brass,* 98 parts; *lead,* 2 parts; melted together.

2. *Copper,* 61 parts; *zinc,* 36 parts; *lead,* 3 parts.

3. *Copper,* 65 parts; *zinc,* 33 parts; *lead,* 2 parts.

j. For Wire:—1. *Copper,* 72 parts; *zinc,* 28 parts; the resulting alloy being subsequently properly annealed.

2. *Copper,* 64 parts; *zinc,* 34 parts; as before.

3. To the last add of *lead,* 2 parts.

Anal. This may be briefly described as follows:—

a. 100 grs. of the alloy is digested in nitric acid. The insoluble portion is peroxide of tin, every 74 grs. of which, when washed and dried, contain 58 grs. of metallic tin.

b. Sulphuric acid is added to the nitric solution as long as a white precipitate falls; after a time the precipitate is collected on a filter, washed with a mixture of water and alcohol, and ignited in a porcelain crucible. Every 152 grs. of the residuum represents 104 grs. of metallic lead.

c. The liquid filtered from the precipitate of sulphate of lead is treated with a stream of sulphuretted hydrogen; the precipitate is collected on a filter, washed with water mixed with a little sulphuretted hydrogen, dried, and
digested in pure nitric acid until the
which separates acquires its natu
yellow colour; the resulting solutio
diluted with water, and reprecipita
potassa, the whole being boiled until
cipitated oxide of copper becomes
brown or black; it is then collect
filter, washed, dried, ignited in a
crucible, and weighed therein im
after it becomes cold. Every 40 grs.
of copper thus obtained represents
pure copper.

d. The liquid poured from the pre
sulphide of copper is boiled for
minute, when it is precipitated with a
of carbonate of sodium; the whole is th
for a few minutes, and the precipita
of zinc collected, washed, dried, and
Every 40 grs. of this oxide contains
metallic zinc.

Concluding remarks. In the ad
his formula the operator should be en
by the object he has in view. T
the proportion of copper, the deepe
the colour, and the greater the den
within certain limits, the toughne
alloy. Zinc lessens the specific gra
colour. Tin gives it hardness an
whilst lead toughens it, and renders
for turning. These facts are known
experienced brass-founder. See All
per, Mosaic Gold, Prince's Metal,
&c.

BRASS'-COLOUR. *Syn.* Brass-
B.-bronze. *Prep.* 1. Grind copper
the precipitated powder of copper, wi
red ochre. Red-coloured.

2. *Gold-coloured brass,* or *Dutch lea*
to a very fine powder. Yellow or gold

Obs. Before application these po
mixed up with pale varnish, no m
worked up at once than is wanted f
diate use. They are also applied b
them over any surface previously cov
varnish to make them adhere.

BRASS-PASTE. *Prep.* 1. *Soft so*
rotten-stone, 4 oz.; beaten to a paste

2. Rotten-stone made into a p
sweet oil.

3. *Rotten-stone,* 4 oz.; *oxalic acid*
powder), 1 oz.; *sweet oil,* 1½ oz.; tu
q. s. to make a paste.

Obs. The above are used to cle
work, when neither varnished nor
The first and last are best applied wi
water; the second, with a little spi
pentine or sweet oil. Both requir
with soft leather. See Brass-work
&c.

BRASS-STAIN. *Prep.* 1. Sheet-b
into small pieces), is exposed to a st
for 2 or 3 days, then powdered,
further exposed in a like manner f
days; the whole is then reduced to
der, and exposed, a third time, to hea
it occasionally, to see if it be sufficien

moving about; they are lastly boiled in the Brazil-wood bath for about ½ an hour.

Obs. The shades of colour given with Brazil-wood may be modified by varying the strength of the bath, the mordant, &c. The addition of a little alum turns it on the purple. A little alkali added to the bath, or passing the goods, after being dyed, through water holding a little alkali in solution, produces what is called false crimson. A deep crimson is obtained by adding a little logwood to the Brazil-wood bath. 1 lb. of Brazil-wood, ½ oz. of alum, and 2 oz. of tartar, are sufficient to dye from 20 to 28 lbs. of cotton, according to the depth of shade required. See DYEING, RED DYES, &c.

BRAZI′LINE (-zēle′-ĭn). *Syn.* BREZE″LĬNE, SAPAN′ĬNE. The colouring matter of Brazil-wood. It forms small orange-coloured needles, soluble in both water and alcohol. Alkalies turn it violet; acids, yellow.

BRA″ZING. The operation of uniting pieces of copper, brass, iron, &c., by means of hard solder.

Proc. The edges, after being filed or scraped quite clean, are covered with a mixture of hard solder and powdered borax, made into a paste with water. The whole is then allowed to dry, and is afterwards exposed, in a clear fire, to a heat sufficient to melt the solder. See AUTOGENOUS, SOLDERING, SOLDERS, &c.

BREAD (brĕd). *Syn.* PA′NIS, L.; PAIN, Fr.; BROD, Ger.; BROOD, Dut.; BRÖD, Dan., Swed.; BREOD, Sax. Loaves or cakes made from ground corn, and constituting the staple article of food of all civilised nations.

This important article of food is made of the flour of different cereal grains, but only those that contain gluten admit of conversion into light or spongy bread. In this respect wheat-flour is superior to all others. When this flour is made into a paste or dough with water, and the dough, previous to baking, is left for some time in a moderately warm place, a state of fermentation comes on, owing to the sugar of the flour gradually undergoing the process of conversion into alcohol, in every respect similar to that which takes place during the fermentation of wine and beer. In this process a large quantity of carbonic acid gas is liberated, and the toughness of the dough preventing its escape, the whole mass becomes puffed up and spongy, and a light porous paste is formed, the porosity of which is still further increased by the heat of the oven. The natural process of fermenting the dough just described is, however, tedious and uncertain, whilst the dough has a tendency to run into the acetous fermentation, and to acquire a sour and disagreeable taste, by which it is rendered less nutritious, and less easy of digestion. This has led to the use of a ferment, which produces a similar condition more speedily, and with greater certainty. Leaven or dough was originally employed for this purpose, and the bread so mad
called LEAVENED BREAD. At the
barm or yeast is almost univers
this purpose. All that is essenti
loaf of bread, is to add a proper
yeast to the dough, and to allow
for a short time in a warm place,
as it rises or becomes spongy, to
the process of baking.

In preparing his dough, the m
takes a part of the water needed f
and having rendered it tepid or lu
to 90° Fahr.) by the addition of b
dissolves his salt in it, and add
together with a portion of the f
these he forms a thin dough, w
aside in a moderately warm place
the purpose, and technically called
ing trough,' 'prover,' or 'tryer,' w
begins to ferment and swell up.
is called 'setting the sponge;' an
to the proportion the water in it
whole quantity that is to be used,
the name of 'whole,' 'half,' or 'qua
Here, the sponge heaves and swell
mately the surface bursts and sub
not checked, swells again and again
manner, and would continue to
the whole of the 'saccharine m
destroyed, and the dough had b
The baker is careful, however, to s
it has communicated a sourness t
After the first, or at the furthes
second or third 'dropping of the
adds the remaining quantity of f
and salt, necessary to form the '
then kneads the whole until it be
ciently tough and elastic to bear
of the hand without adhering t
'dough' is now left to itself for a
during which the fermentation st
The inflated mass is then again k
into pieces, weighed, and shaped
In an hour, or two, these unbaked
up to nearly double their former s
then placed in the oven, and bake
this operation they continue for a
crease in size, in consequence of
of the pent-up gas by the heat. A
fermentation is checked, and the
comes too solid to admit of fur
tion.

Such are the principles and pra
art of baking. The operations a
the same on both the small and
scale, and therefore need not be
described.

Adult. The adulteration of bot
bread is carried to a fearful extent,
cially in London. The bakers' f
often made of the worst kinds
foreign wheat; and other cereal
particularly beans, are mixed wi
grinding them into flour. In this
fewer than *six* distinct kinds of w
are brought into the market—

once or after some hours, it is potash; otherwise, the alkali present is soda.

5. **CHALK, WHITING, BURNT BONES, PLASTER OF PARIS**, and similar substances, are easily detected by calcining a little of the flour or bread in a clean open vessel, when the amount of ash left will indicate the quantity of adulteration. The quantity of the ash left by genuine bread or flour is very trifling indeed, about 2%.

Concluding remarks. A number of processes are used by cooks and confectioners to make the different varieties of fancy bread, cakes, puddings, &c., which vary according to the peculiar characteristic it is desired to communicate to them; but none of these articles properly belong to the trade of the common baker. Thus, some kinds of cakes and pastes are made to eat 'short,' as it is called, or are rendered less tenacious, and a species of brittleness imparted to them, by the addition of starch, rice-flour, or sugar. In pastry a similar effect and peculiar lightness is produced by butter or lard, whilst in some articles, white-of-egg, gum-water, isinglass, and other adhesive substances, are added to produce an exceedingly light and porous mass.

The different varieties of bread made in England vary, in their quality, chiefly according to the flour of which they are formed. The best **WHITE BREAD** is made from the purest wheat-flour; ordinary **WHEATEN BREAD**, of flour containing a little of the finest bran; **SECONDS**, from flour containing a still larger proportion of bran; and common **HOUSEHOLD-BREAD**, from flour produced by grinding the whole substance of the grain, without *any* separation of the bran. The last variety is undoubtedly the most wholesome and nutritious, although that least frequently used. **SYMNEL-BREAD, MANCHET** or **ROLL-BREAD**, and **FRENCH BREAD**, are varieties made of the purest flour, from the finest wheat, a little milk being usually added for rolls, and butter and eggs for choicer purposes. Several other minor kinds of bread are also made, varied by the addition of sundry trifles, as sugar, currants, and other palatable ingredients. The **SCOTCH SHORT-BREAD** is made from a very thick dough, to which butter, sugar, orange-peel, and spices, are added, according to the taste of the maker.

In the manufacture of white bread from damaged or inferior flour, a large quantity of alum is employed by the fraudulent baker, as already noticed; but with the 'best flour' no alum is required. The utmost beauty, sponginess, and sweetness may be given to bread without the addition of one particle of alum, provided the best materials alone enter into its composition. As such materials are seldom employed by the bakers, the usual practice is to introduce 4 or 5 oz. of alum to every sack of flour, or about 1 oz. to each bushel; and very frequently fully double this quantity of *alum is employed.* But even this enormous
quantity is often not the whole of
present in common bread; for the
order to cheat the baker, puts in the '
in the shape of 4 to 6 oz. of alum to
whilst the baker, unconscious of this
sation, subsequently uses a double dose
in order to cheat his customers.[1] The
of detecting this pernicious adulter
been already explained. The proper
of salt is 4 lbs., and never more than
the sack, or 1 lb. per bushel. One
best flour, with 4 or 5 lbs. of salt, yield
360 lbs. of good bread; and a sack of
345 to 350 lbs. of bread; each being mod
baked. If the loaves are well-baked
baked, the product will be from 345 to
only; but if they are slack-baked or
baked, from 370 lbs. to 385 lbs. of
bread may be obtained from 1 sack
white flour.

The attention of chemists has, at
times, been directed in search of some
to rectify or lessen the effects of bad
ing and improper storage on grain, so
damaged or inferior article might be
serviceable, and available for human
Prof. E. Davy recommends the addition
of carbonate of magnesia to about every
of sour, melted, heated, and similarly
flour. This substance materially impro
quality of the bread, "even when
the worst new seconds flour;" whilst it
to be perfectly harmless; and the
prepared, for temporary use, is certainly
jectionable. What effects would arise
the daily consumption of such bread
ral months has not been determined;
doubtful whether it would prove
Indeed there are sufficient reasons
demning the adoption of such bread
general diet of a people for any very
ened period.[2] Our own experiments in
making, extending over a long period of
lead us to prefer carbonate or bicarbo
soda, for the purpose. Theoretically,
responding salts of potassa would be
able. A mixture of equal parts of the
bonates of potassa and of soda, will,
ultimately be found to be more useful
either substance used separately.

In times of scarcity and famine
substances, besides the flour of the
have been made into bread, or have
mixed with it, in order to lessen the
of the former required by the people.
this purpose, almost every amylaceous
table at once plentiful and cheap, has,
turn, been eagerly appropriated.
beech-mast, the leguminous seeds,

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[1] The common excuse of the bakers for using
that without it the bread is not sufficiently
please their customers, and that the batches
easily parted into loaves after baking; but
shown that clear lime-water, which is perfectly
will effect the same object if substituted for the
water used to make the dough.

[2] See GOITRE, MAGNESIA, &c.

ous roots, and similar substances,
mployed, either in the form of
e into an emulsion or jelly, which
d instead of water to form the
d-corn into a dough. At such
he most nutritious and valuable
e grain, although usually rejected
has been retained in the flour,
n been added to it in excess.
, a brewer of Constance, during a
city, succeeded in manufacturing
the farinaceous residue of beer
ins). 10 lbs. of this substance,
aste, with ¼ lb. of yeast, 5 lbs. of
l, and a handful of salt, produces
ACK BREAD, which is said to be
y and nourishing." The nutri-
of brewers' grains is shown by
ive employment at the present
r pigs and cattle, and particularly
rs. In like manner Iceland, Car-
d other mosses, have been made
either alone, or mixed with flour
hey are used, in the first case, in
meal, in the same way as flour;
d case, 7 lbs. of moss are directed
l in 10 or 12 galls. of water, and
g glutinous liquid or jelly to be
make 70 lbs. of flour into dough,
hen fermented and baked in the
It is said that flour thus produces
e its weight of good household-
impler plan is to mix 1 lb. of lichen
3 or 4 lbs. of flour; the bitterness
hen having been first extracted by
in cold water. Bread so prepared
been highly recommended for the
d dyspeptic. The modern baker is
bit of mixing large quantities of
ith his bread, whenever he can pur-
n at paying prices. Mealy potatoes
ed, and are carefully mashed or
d the dry flour is worked into this
ugh, which is then mixed with the
the usual manner. For inferior
al weights of potato pulp and dry
often used. Bread so prepared eats
d is deficient in sponginess, and in
yellowish-white tint which forms one
racteristic of pure wheaten bread

now very generally surcharge their bread with such an excess of water that, in many cases, it only possesses two thirds the amount of nourishment which it did before the publication of the system just referred to. Unfortunately, the cupidity of dishonest tradesmen appears to be continually impelling them to avail themselves of the exertions of philanthropists and the discoveries of science, in order to increase their profits, regardless alike of the quality of their commodities and the health of their customers. Bread containing an excess of water rapidly becomes sour and mouldy, and is apt to disorder the digestive functions of those who eat it.

From the experiments of Dr. Colquhoun, it appears that the starch of flour is partially converted into sugar during the process of fermenting and baking the dough, and thus contributes to the sweetness of the bread. He proposes to add to the flour, arrow-root, the farina of potatoes, and similar amylaceous substances, made into a jelly with hot water, for this purpose. Dr. Percival has recommended the addition of salep with the same intention. 1 oz. of salep, dissolved in 1 quart of water; 2 lbs. of flour; 80 grs. of salt; and 2 ozs. of yeast, gave 3 lbs. 2 oz. of good bread. The same weight of materials, without the salep, gave only 2¼ lbs. If too much salep is added, it gives its peculiar flavour to the bread.

In reference to the above substitutions, and to the relative quantity of bread produced from any given weight of flour, the reader should remember that the mere increase of the weight or bulk of the product does not carry with it a corresponding increase of the nutritive elements contained in the flour. These remain the same, in all cases; and just in proportion as the product, in bread, is greater, will be the decrease in the value of such bread as food. So also with potatoes, rice, and other farinaceous and pulpy substances used as substitutes for wheat-flour. Their poverty in nitrogenous matter, or flesh-formers, is so great, that the greatly increased quantity required as food, to support the body, apart from mere inconvenience, more than compensates for their apparent low price. Thus good wheaten be sufficiently heated before the bread is put into it, in order that the gas contained in the cells of the 'sponge' may be expanded as rapidly as possible by the heat, and the resulting light mass quickly rendered sufficiently solid to prevent its subsequent collapse. The heat should also be maintained at nearly the same temperature during the whole of the time the bread is submitted to its action. In general, with ordinary kitchen ovens properly heated, 30 minutes' baking is sufficient for one-pound loaves and cakes; and 15 minutes in addition for every pound after the first, for larger ones. Thus, a 1 lb. loaf requires ½ hour; a 2 lb. loaf ¾ hour; and a 4 lb. loaf, 1¼ hour.

It is the common ambition of the English baker to give that peculiar tint to the crust of his bread in the process of baking which is so highly esteemed by connoisseurs, and so successfully produced by the Viennese and Parisians. It has been long known at Vienna, that if the hearth of an oven be cleaned with a moistened wisp of straw, the crust of bread baked in it immediately afterwards, presents a beautiful yellow tint. It was thence inferred that this peculiarity depends on the vapour, which being condensed on the roof of the oven, falls back on the bread. At Paris, in order to secure with certainty so desirable an appearance, the hearth of the oven is generally laid so as to form an inclined plane, with a rise of about 11 inches in 3 feet; and the arched roof is built lower at the end nearest the door, as compared with the further extremity. When the oven is charged, the entrance is closed with a wet bundle of straw. By this arrangement the steam is driven down on the bread, and a golden-yellow crust is given to it, as if it had been previously covered with the yelk of an egg.

Pure wheaten bread is one of the most wholesome articles of food, and has been justly termed the 'staff of life.' When well fermented and baked, it is very easy of digestion. It should never be eaten until it has stood at least 24 hours after being taken out of the oven. When newer, bread is apt to disagree with the stomach, frequently producing indigestion, biliousness, diarrhœa, dyspepsia, and other like ailments. Bread prepared from meal containing the whole of the bran is the most nutritious and digestible, and should alone be given to children and growing persons, and eaten by the dyspeptic and delicate. See ALEUROMETER, ALUM, FLOUR, WHEAT, &c.

Bread, Aerated. For a full description of the method of preparing this article, *see* Watts' 'Dic. of Chemistry.'

Bread, Amer'ican. From American barreled flour. "14 lbs. of American flour will make 21½ lbs. of bread; whereas the best sort of English flour produces only 18¼ lbs. of bread." (Mrs. Rundell.) This arises from the superior *quality of the wheat used in its production; and also from its* being kiln-dried before grinding, by which much water i
off.

Bread, Bee. The matter collected
to form the bottom of the hive. It
a mixture of resin and wax. Its f
formerly thought to be anti-asthmati

Bread, Bran. 1. From the whole m
out sifting out any of the bran.

2. By adding about 3 oz. of bran to
of ordinary flour.

Bread, Extemporaneous. See UNFE
BREAD.

Bread, French. *Prep.* 1. From fine
the best white bread. For the bett
and for those intended for rolls and sm
bread, the sponge and dough is c
wetted with milk and water, and, occ
a very little butter is added. "When
or small fancy loaves have lain in a qu
about a quarter of an hour, turn them
other side for about a quarter of a
longer. Then take them out and ch
with a knife, which will make th
spongy, and of a fine yellow; whereas
takes off this fine colour, and renders th
less inviting."

2. FRENCH SOUP-BREAD. From fi
but employing fully double the usual q
of salt. It is baked in thin loaves, so a
nearly all crust, by which means it b
more soluble in hot soup.

Bread, Hick's Pat'ent. This is
bread baked in an oven so arranged th
vapours arising during the process a
densed in a suitable receiver. The co
liquor is a crude, weak spirit, produced
the fermentation of the dough, and p
little commercial value; indeed, insuffi
pay for the expenses attending its coll
Besides which, the bread prepared und
patent was rejected by the vulgar, who
to the shops of the neighbouring baker
professed to sell their bread with "t
in it."

Bread, Household. This name is com
given to bread made with flour from
only the coarser portion of the bran ha
removed; and to bread prepared f
mixture of flour and potatoes. The foll
are examples:—

1. (Rev. Mr. Haggett.) Remove the
bran from flour, 14 lbs.; boil the b
1 gal. of water until reduced to 7
strain, cool, and knead in the flour, addi
and yeast as for other bread. Very whol

2. Flour, 7 lbs.; mealy potatoes (well
ed), 3 lbs.; as before. Objectionable f
reasons already given.

Bread, Leav'ened. (lĕv'-). Using lea
stead of yeast, and in the same way.
1 lb. to each bushel of flour is usually
cient. The more leaven used, the ligh
bread made with it will be; and the f
and sweeter the leaven, the less sour
taste. Leaven, except among the Jew
sailors, is now superseded by yeast.

on White (lūn′-). The common
the London bakers are—Flour,
non salt, 4½ lbs.; alum, 5 oz.;
warm water for the sponge (about)
process has been already noticed.
White. The following has been
s the plan commonly adopted by
rs for their best white bread:—
he dough (before the yeast was
yesterday's baking, as much
ter is poured as will be required
lbs. of flour into a rather thin
n as this has risen, 80 lbs. are
l reserved in a warm place as
next day's baking; 1 lb. of dry
d in warm water, is then added
ng portion, and the whole lightly
oon as it has sufficiently risen,
o loaves, and shortly afterwards
oaves being placed in the oven
ing each other, so that they may
y all round.

rment′ed. *Syn.* EXTEMPORA″NE-
Prep. 1. From Jones's patent
wholesome and excellent; in-
kilfully made and baked, almost
ch bread.
ewell's patent flour. Slightly in-
last.
h lb. of flour, add, separately,
rbonate of soda, and 1 dr. of tar-
oth perfectly dry, and in very fine
b them well together with the
l thoroughly incorporated; then
hole into a dough with water, as
ssible, and at once bake in a quick
t 8 or 9 oz. of water are required
. of flour. Answers well when ex-
ged.
1 lb.; bicarbonate of soda, 1 dr.;
a dough with water, q. s., to which
drochloric acid (commercial) has
, and further proceed as before.
ng's PATENT BREAD:—This closely
the last. The proportions are—
s.; carbonate of soda and hydro-
d, of each, 1 oz.; water, 2¾ pints.
d was suggested by Dr. Henry, in
was patented by Dr. Whiting in
the proportions be not observed, or
e be not perfect, the quality of the
s. The action of the acid on the
common salt in the loaf.
ONT′ACAL BREAD:—Carbonate of
¾ to 1 oz.; cold water, q. s.; dis-
of flour, 7 lbs.; and make a dough,
t be formed into loaves and baked
ly, as before.—*Obs.* To ensure suc-
rbonate should be recent, and free
bonate, the presence of which is
its being white and powdery, and
pungency. If any of the last salt
, the bread will have a yellowish
d a slightly alkaline or urinous
The process *answers best for small*
s and fancy bread. By employing pure carbonate of ammonia instead of the commercial sesquicarbonate, the process succeeds admirably, and the resulting bread is most wholesome. A late writer recommends the use of bicarbonate of ammonia, but evidently does so in ignorance, as in practice it is inapplicable, as we have verified by numerous carefully conducted experiments.

7. It has been at various times proposed to knead the dough with water highly charged with carbonic acid, on which Dr. Ure observes, that "the resulting bread will be somewhat spongy." We have repeatedly endeavoured to make bread in this way, but never could succeed in producing a light spongy loaf. The quantity of gas in the water is much too trifling for the purpose, and the greater part of it escapes in the process of making the dough, even though all the materials be well cooled, and the operation conducted in a cold place. The only way of obviating the difficulty is to conduct the kneading in a trough under considerable atmospheric pressure, and at a very low temperature, by means of machinery, as is done by Dr. Dauglish, whose method is now protected by letters patent. This method is not, however, adapted either to domestic use or the small scale.[1]

Obs. Unfermented bread has been strongly recommended as being more wholesome, and generally better adapted to bilious and dyspeptic patients, than fermented bread. It must, however, be confessed, that the unfermented bread commonly met with, has a slight 'raw-grain' taste, which is very disagreeable to some persons. But this taste is not necessarily present, being chiefly dependent on bad manipulation, the use of inferior flour, and insufficient baking. The process of fermentation doubtless modifies the condition of the starch and gluten of the dough, and renders them easier of digestion. This species of bread is sadly adulterated with a variety of indescribable messes. See BISCUITS, BREAD (*antè*), FLOUR, GINGERBREAD, &c.

BREAK′FAST (brĕk′-). *Syn.* JENTAC′ULUM, L.; DÉJEÛNER, DÉJEÛNÉ, Fr.; FRÜHSTÜCK, Ger. The first meal of the day; or the food served at it.

The morning meal—the '*early bit*' of the Germans—is, perhaps, the most important one of the day. According to Erasmus Wilson, it is usually "taken at eight or nine." The proper time for the purpose must, however, depend upon that at which the party rises. About an hour, to an hour and a half, after leaving the bed, will generally be found the most appropriate time for breakfast, and appears to be the one pointed out by nature, and the most conducive to health. By that time the powers of the system have fully recovered from the inactivity of sleep, and the functions of the stomach and other viscera have again come into full play. The appetite is excited and seeks appeasing, and both instinct and reason direct us to the social board. If abstinence be now prolonged, the physical and mental energies, unsupported by the supply of food which indirectly gives them birth, gradually lessen, and incipient exhaustion ensues. The fluids of the stomach and the smaller intestines begin to act upon the coats of those viscera, instead of on the food, and an unpleasant feeling of hunger, or a loss of appetite comes on, with all its depressing consequences. When breakfast cannot be taken within a reasonable period after rising, the gap should be filled up by chewing a crust, a biscuit, or the like. A raw egg or two, sucked from the shell, or broken into a teacup and drank, will be found most valuable for this purpose. Raw milk, cheese, salted food, and other indigestible matter, should be particularly avoided at this early period of the day.

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[1] *For a full description of Dauglish's process, see Watts' 'Dic. of Chemistry.'*

The articles of food to be chosen for the breakfast-table must depend entirely on the state of the health, the occupations, &c., of those assembled round it. Coffee appears to be, by common consent, the favourite beverage. For the delicate, the bilious, and the young, it should neither be taken too strong, nor very weak, and should be softened down with milk or cream, and well sweetened with sugar. Tea is more apt to affect the nerves and stomach than pure unchicoried coffee. Green tea, taken thus early in the day, often acts as an absolute poison, though a slow one. We have seen severe fits of vomiting and exhaustion follow its use.

The solid food for breakfast should be easy of digestion, and nutritious. Females, children, and persons leading a sedentary life, should confine themselves to a sufficient quantity of good meal-bread with only a moderate quantity of butter, to which an egg, or a small rasher of mild bacon, may be advantageously added. Parties engaged in active occupations may extend their exploits somewhat farther, and add to this bill of fare a little ham or cold meat. When an undue time will elapse before the luncheon or dinner, and particularly during the colder season of the year, the broiled leg of a fowl, an underdressed mutton chop, or a little tender beef-steak, will be found, by the parties last referred to, most useful; nay, in many cases, invaluable. But excess must be particularly avoided. The object is to take enough food to maintain the system in full energy and vigour, and particularly to avoid offending the stomach by overloading it; a misfortune easily effected at the breakfast table. Old commercial travellers —men wise in the mysteries of life and its enjoyments—are scrupulously careful to make a good, but not a heavy breakfast, before commencing the arduous duties of the day. See DÉJEÛNER, MEALS, &c.

Breakfast Pow'der. *Syn.* RYE'-COFFEE, *DILLEN'IUS'S C.*, HUNT'S ECONOM'ICAL BREAKFAST POWDER, &c. Rye, roast with a little fat, after the manner of It was once sold at 2*s*. 6*d*. the lb., formerly extensively used as a subst foreign coffee, of which it is one of the est and best. Since the reduction of coffee it has nearly fallen into disuse, be by the grocers to adulterate that

BREAST (Sore). See NIPPLES.

BREATH (Fetid). Scarcely any more disagreeable or disgusting than ing breath. Various means have been to remove this annoyance, depending pally on the administration of which by their odour smother it but these require continual repetition, liable to interfere with the functions tion. The real cause of stinking generally be traced to a diseased to decayed teeth. When the former case, mild aperients should be and if these do not succeed, an be given, followed by an occasional the *Abernethy-medicines*. When rotten are the cause, they should be cleansed, and then 'stopped;' or if impracticable, they should be removed. this is impossible or inconvenient, may usually be lessened by keeping scrupulously clean. Dirty teeth cause the breath to smell; and hence of the tooth-brush should be a daily. Occasionally rinsing out the mouth little clean water to which a few solution of chloride of lime, or of soda, has been added, is often an method. As a tooth-powder, fresh charcoal, and particularly areca-nut is without comparison the best. such as the following, have been commended to sweeten and purify the —*Gum-catechu*, 2 oz.; *white sugar*, *orris powder*, 1 oz.; *neroli*, 5 or 6 make them into a paste with divide the mass into very small or 30 drops of *oil of cloves* may be for the orris and neroli, at will. may be sucked at pleasure. See AROMATISÉ, PASTILS, &c.

BREW'ING. The art of making The only ingredients allowed by enter into the composition of beer sugar, hops or any substitute for water, together with a little yeast.

The apparatus and utensils required the common system, in brewing beer,

1. A copper or boiler capable of fully two thirds of the quantity be brewed; with a gauge-stick to the number of gallons of fluid at depth therein; and a wooden cover over it before the boiling commences, not in use. A copper capable of less than 140 galls. is a convenient brewing a quarter of malt, and is known as a one-quarter copper.

verted into sugar, and the action of the second and third mashings is merely to wash out any of the remaining saccharine matter still adhering to the crushed grains.

In practice, as soon as the water in the copper acquires the temperature of 170°, 45 galls. are run into the mash-tun, and 1 quarter of crushed malt gradually added to it. The whole is now thoroughly mixed with the mash liquor, by means of oars, or machinery, the agitation (mashing) being continued for 30 or 40 minutes, when 36 galls. more water from the copper are added, and the whole again well agitated, as before. The mash-tun is now closely covered up, and the mash allowed to repose for about two hours, in order that the 'diastase' may exert its saccharifying power upon the unconverted starch of the malt. At the end of this time the tap is set, and the wort run into the 'underback.' It generally amounts to about 50 galls. The second mash is then made with about 60 galls. of water, at 185° F., and the whole process repeated as before. After an hour, the liquor is drawn off, and the malt drained ready for the third mash. This time, only 35 galls. of water are added at 200° F., and the whole is seldom allowed to stand longer than half an hour. It is then run off, and the malt allowed to drain as dry as possible.

In some cases, the worts of the first and second mashes only are used for strong beer; that of the third mashing being kept for table beer, or as liquor to mash a fresh quantity of malt.

Pale malt and mixtures of malt and raw grain should be mashed for a longer time, and at a somewhat lower temperature than brown or high-dried malt.

Instead of making second and third mashes as above described, it has long been the practice in Scotland, and is now becoming common in England, to sprinkle the surface of the grains in the mash-tun with water, at or about the temperature of 180° F., by means of a simple revolving instrument termed a 'sparger,' and to let the liquor drain through the goods and run off by the tap with the last portions of the first wort. By this means the whole surface of the grain is continuously and regularly sprinkled with hot water.

When sugar is used, it may be either mixed with the malt in the mash-tun, at the time of mashing, or put into the underback, just before setting the taps, and the hot wort run upon it. The proportions of malt and sugar vary, according to the quality of the latter, but, on an average, from 170 lbs. to 200 lbs. of good raw sugar may be taken as the equivalent of a quarter of malt.

2. Boiling:—The wort is next transferred from the underback to the copper, and heated to the boiling-point as soon as possible, the object of this expedition being to prevent the formation of acid in the wort, by exposure to the air, before undergoing the changes which take place in the copper. As soon as the the wort commences the hops are the boiling is continued for about hours. A longer boiling is highly able, owing to the extraction of a sinous bitter from the hop, and the losing the volatile oil upon which depends. For mild beers the worts dom boiled so long; for strong sometimes a little longer. The known to be completed when 'clears,' as it is called, and albumin sink to the bottom of the copper.

The hops, strained from each wort, turned into the copper with the follow

The average loss by evaporation in cess of boiling varies from [illegible]th to original bulk of the wort. The creases at the same time in about 5 to 4; so that, if the gravity be, at 32 lbs. per barrel, it will at the operation have risen to about 40 lbs.

3. Cooling:—The wort, under the system, is 'run off' from the copper 'hop-back,' through a strainer which back the hops. It is then large square shallow vessels called where it is freely exposed to a current to reduce its temperature as quickly sible, in order to avoid acidity or In 6 or 7 hours, or sooner, the should fall to about 60° Fahr. In ther the depth of the liquor in the should not exceed 3 or 4 inches; and weather, not more than 5 or 6 soon as the temperature has fallen 60° the liquor is 'tunned' and 'yeasted

The loss by evaporation and in the coolers, varies from 13 to 18 quarter.

4. Fermentation: — The cooled next run into the fermenting tuns (gyle-tuns). In small brewings these casks, with one of their heads under any form they must not be $\frac{2}{3}$ds filled. The yeast, previously little wort, and kept until the whole to ferment (technically termed 'lobb' added, and after agitation, the vered up, and kept so, until the is well established. By this time the rature has risen from 9° to 15°.

The quantity of yeast employed, temperature of the wort when it differs in different breweries and for kinds of beer. It seldom exceeds barrel, unless the weather is unusually the yeast old or stale, when a larger tion is required. The Scotch brewer rally take only 1 gal. of yeast to fully of wort.

In England, the temperature at yeast is added, varies from 55° to In Scotland, the common to 52°. In cold weather, the heat or 6° higher than in mild and

more yeast may also be advan-
nployed. In cold weather, ale is
anned at 60°, porter at 64,° and
s at 65° or 70° Fahr. In 'warm
rong beer should be 4° or 5°, and
° or 8° cooler than the 'heats' just
On the small scale, 1 to 1½ pint
be used to every barrel of strong-
nd ½ pint to every barrel of mild-

nencement of the fermentation is
a line of small bubbles forming
sides of the tun, and in a short
ding over the whole surface. A
d' soon forms, and then a 'fine
' followed by a 'light frothy' one.
he 'head' assumes a yeasty appear-
lour becomes yellowish-brown, and
lour is developed. As soon as this
egins to fall, the tun is skimmed
3 hours, until no more yeast is
he object of this is, not only to
violence of the fermentation, but
move a peculiar bitterness, with
first portion of the yeast is impreg-
e beer is then put into casks, or
' as it is called. A minute attention
tage of this process is necessary to
ne flavour and a brilliant beverage.
be regarded, as a rule, that the lower
rature, and the slower, more regular,
interrupted the process of fermenta-
better will be the quality of the
and the less likely to change by age.
more yeast is required in winter than
r. When the fermentation becomes
the 'gyle-tun,' a little more 'lobb' is
y added, and the whole is well 'roused
n the contrary, if the temperature rises
ably, or the fermentation becomes too
he wort is cooled a little and skimmed,
ce cleansed.
ANSING :—This consists in running
r from the gyle-tun into casks, or other
set sloping, so that the yeast, as it
may work off the one side of the top,
into a vessel placed below to receive it.
l brewings, the beer is often at once
red from the gyle-tun to the 'store-
which are sloped a little until the fer-
ion is over, when they are skimmed,
nd bunged.
process of cleansing is generally com-
as soon as the 'saccharine' in the fer-
g wort falls to about 10 lbs. per barrel,
e of attenuation which it usually reaches
t 48 hours. Some brewers add a little
lour or bean-flour (about ½ lb. per barrel)
beer in the gyle-tun, shortly before
g, to quicken the discharge of yeast;
not clearly ascertained whether such
advantageous, or the contrary.
[illegible] :—As soon as the fermentation
ded, which generally takes from 6 to
r longer, the clear liquor *is pumped*
store-casks or vats, which are then
closely bunged, and deposited in a cool cellar, if not already there, to mature. The preference, which at present exists in most parts of the United Kingdom, is for mild, freshly-brewed malt liquors; the good old or mature-vatted beer, being now seldom met with. This, of course, is a source of increased profit to the brewer, as it enables him to turn over his capital more rapidly, and saves the risk and expense attendant on long storage.

7. RIPENING :—After a period varying from one to twelve months, or longer, according to the nature of the brewing, and the condition of the cellar, the liquor will have become fine, and sufficiently mature for use. During this period the casks, &c., should be occasionally examined to see that there is no leakage, and to open the vent-holes, should any oozings appear at the joints. As equable a temperature as possible should be maintained in the cellar, by ventilation, on the one hand, and the employment of artificial heat on the other, as circumstances and seasonal changes may render necessary.

8. FINING or CLARIFYING :—Beer which has been badly brewed or badly stored, or which from other causes may be thick or muddy, requires clarifying by artificial means. For a barrel about 1 to 1½ pint of brewer's finings (isinglass or fish-gelatine dissolved in sour beer) is put into a bucket, and some of the beer being gradually added, the whole is violently agitated with a whisk until a frothy head is formed. The mixture is then thrown into the cask of beer, and well 'rummaged up,' after which the bung is replaced, and the liquor allowed to repose for a week or ten days.

Sometimes the above method is found to fail with weak and bad-conditioned beer. When such is the case, the addition of a teaspoonful of sulphuric acid, or a table-spoonful of powdered catechu (previously dissolved in ½ a pint of boiling water), followed by agitation for a quarter of an hour, will generally cause the 'finings' to clarify the liquor; 2 or 3 oz. of tincture of catechu (mixed with a little water) may be used in the same way. A handful of hops, previously boiled for five minutes in a little of the beer, and then added to the barrel, and the whole allowed to stand for a few days, before proceeding to clarify it, will generally have a similar effect, and cause the 'finings' to act with certainty. It is the absence of the proper quantity of astringent matter in beer that usually renders them ineffective.

Gen. commentary. The preceding is a concise account of all the essential operations of the system of brewing at present practised in this country. On the large scale, extensive and costly apparatus and machinery are employed for the purpose. On the small scale, various modifications, of a minor character, or *the several processes* herein detailed, are frequently adopted, according to the circumstances or ingenuity of the operator. The principles and practice of brewing beer are, however, essentially the same under all the conditions here referred to. In Scotland, only one mash is made, and that at a temperature of about 180° Fahr., with one third of the quantity of the water required for the brewing. The 'mash-tun' is then covered up for about half an hour, when the wort is drawn off, and the operation of 'sparging' begun. This operation is continued until the density of the mixed worts becomes adapted to produce the quality of the ale then under process of manufacture. The 'gyle-tun' (fermenting-tun) is set at from 50° to 60° Fahr., the fermentation being continued slowly for fifteen to twenty days; and the ale is not 'cleansed' before the degree of attenuation falls to about ¼ lb. per day, and not more than one fourth of the original gravity of the wort remains. Scotch ale is justly celebrated for its superior quality. Its usual original gravity is from 34 to 45 lbs. per barrel.

In Bavaria, a country remarkable for the excellence of its beer, the wort is made to ferment at a low temperature, until all the substances which favour acetification have been rendered insoluble, and have separated from the liquor. The fermentation is conducted in wide, open, shallow vessels, which afford free and unlimited access to atmospheric oxygen; and this in a situation where the temperature does not exceed 45° to 60° Fahr. A separation of the nitrogenous constituents thus takes place simultaneously on the surface, and within the whole body of the liquid. The clearing of the fluid is the sign by which it is known that these matters have separated. The fermentation usually occupies three or four weeks, and is conducted during the cooler portion of the year only, and in a situation removed as much as possible from the influence of atmospherical changes of temperature. The sedimentary yeast (unterhefe), and not the surface yeast (oberhefe), of the Bavarian fermenting backs, is employed.

The beers of England and France, as well as most of those of Germany, become gradually sour by contact with the air. This defect, as observed by Liebig, does not belong to the beers of Bavaria, which may be preserved, at pleasure, in half-full casks, as well as in full ones, without suffering any material alteration. This precious quality must be ascribed to the peculiar process employed for fermenting the wort, called by the German chemists 'untergährung,' or fermentation from below; and which "has solved one of the finest theoretical problems that had long taxed the ingenuity and patience of both the scientific and practical brewer." (Liebig.)

In the ordinary fermentation of grape-juice and worts, these liquids do not furnish a quantity of alcohol equivalent to the sugar which *they* contain; and this because a certain portion *of the sugar* serves for the oxidation of the gluten, and is not transforme rest. But wherever the liquor ha the second period of transformati duct in alcohol ought to be equival quantity of sugar present, as actual in all fermentations (sedimentary) not accompanied with a formation appearance of the yeast. Accord Ure, worts furnish, in the Bavarian from 10% to 20% more alcohol than the ordinary process of fermenta gährung), or that excited by the u hefe' or top-yeast.

East-India Ale or Pale Ale, for e is brewed from worts of a sp. gr. of to 1·070. For the best varieties, 1 of the finest East Kent hops are u quarter of pale malt. The pale a beer of the publicans is commonly a liquor (mere table beer), highly bi the hop, and too often with qua wood, and other still more objecti stances. The process now adop great brewers of pale ale at Burto combines all the most admirable both the Bavarian and Scotch brewing.

Berlin White ale or Pale beer from wheat-malt mixed with about barley-malt, the 'wort' being boiled ¼ lb. to the bushel, and slightly with 'top-yeast,' at a rather high ture.

The desire of evading the duty discovery of its being only necessar ⅓rd, or less, of the grain, in the fo this portion being sufficient to c sugar, in the process of mashing, t the unmalted grain forming the This plan answers well when t merely intended for the productio spirit;' but beer so made is insi ferior in quality to that brewe malt. Inferior kinds of beer ha made from other ingredients than among which may be named the cheaper cereals, bran, potatoes, t root, carrots, parsnips, pea-shell vegetable substances rich in starc all of which will produce beer by t with water in the common way, 9% or 10% of barley-malt.

One quarter of the best barley by skilful mashing, fully 84 lbs. of or soluble sweet extractive matte centrated within the compass o (36 galls.), gives a sp. gr. of 1·2 process of mashing about $\frac{4}{7}$ths of t of saccharine (or 48 lbs.) is generall in the first wort; $\frac{2}{7}$ths (or 24 second wort; and $\frac{1}{7}$th (or 12 lbs.) wort; the strengths of the wo each other respectively as 4, 2, 1 age gravity obtained by the com from malt of current quality, ra to 81 lbs. Sugar may be used a

alt, with, in most cases, some de-
ng to the brewer, and without
quality of the beer. The kind
e used will depend on the quality
o be brewed, but it should be re-
hat a bad sugar will not, any more
lt, yield a sound palatable beer.
. to 200 lbs. of good raw sugar
s as the average equivalent of a
alt.

process of mashing has been pro-
cted, the wort, after leaving the
d not be turned blue by tincture
r by iodide of potassium added
a little acid. If it turns blue
starch has escaped conversion into
s dissolved in the liquor.

plying the decimal part of the
resenting the specific gravity of a
0 (the weight in pounds of a barrel
er), we obtain the quantity of sac-
r barrel, corresponding to the given
d by dividing the joint weight of
and water, per barrel, by 360, we
specific gravity. Thus—
a sample of wort to have a specific
1·055, then—
l of sp. gr. ·055 × 360 = 19·8 lbs.
.
a barrel of wort weighs 379·8 lbs.,
0 lbs., for the weight of a barrel of
d 19·8 lbs. for the weight of saccha-
s water, then—
+ 360 = 1·055 specific gravity.

ually stated in works on brewing
in temperatures must be reached
riety of beer, during the progress of
tation, in order for the liquor to
characteristic flavour. Thus, it is
t—mild beer begins to acquire fla-
the heat of fermentation arrives at
increases at 80°, and is highest at
etimes even reaches 100°. Old ale is
in its best flavour at a temperature
ing 75°; and porter at 70° Fahr.
reach these temperatures, the worts
to be set at from 10° to 15° lower,
sing due to the heat generated
fermentation. That these state-
principally to the old methods of
shown by the fact, that some of the
Bavaria, Scotland, and Burton-on-
uce rich and high-flavoured liquors
ures vastly below those above enu-
Still, however, the fact must not be
hat since the introduction of the
n system of brewing into England,
character of its beers, as they
consumer, are inferior in strength
to those of a former period. We
seek almost in vain for the fine
-flavoured, invigorating old beers
ur early days by the common pub-
avern-keepers, of whom the larger
re their own brewers. *Under the
of chemical brewing, as worked* by those huge monopolists, the 'great brewers,' the only object appears to be to obtain the largest quantity possible of saccharine out of the quarter of malt, and to convert this into the largest possible quantity of beer, with little regard to flavour or quality, but an excessive one for their own profits. In due course this liquor is forced on their helpless tenants, the publicans, who, in their turn, 'reduce' and 'doctor' the liquor, until, by the time it reaches the consumer, its insipidity and low strength would have led even a brewer's drayman of the last century to cast it into the kennel.

The best times for brewing are the spring and autumn; as at those periods of the year the temperature of the air is such as to permit of the easy cooling of worts sufficiently low, without having recourse to artificial refrigeration, or to the use of machinery for the purpose. Old ale cannot be conveniently brewed in summer.

Beers are classed by the brewers into—

Small beers—made from worts not exceeding the sp. gr. 1·025, or 9 lbs. per barrel.

Middlings—made from worts of the sp. gr. 1·030 to 1·050, and averaging about 14 lbs. per barrel.

Strong beers—made from worts of the sp. gr. 1·040 to 1·080, extending from about 35 lbs. per barrel upwards.

The densities of the worts employed for different kinds of beer vary considerably, as will be seen by the following table:—

TABLE *of the Densities of Beers.*

Description.	Pounds per barrel.	Specific gravity.
Burton ale, Class 1	40 to 43	1·111 to 1·120
„ „ 2	35 „ 40	1·097 „ 1·111
„ „ 3	28 „ 33	1·077 „ 1·092
Ordinary ale . .	25 „ 27	1·070 „ 1·075
Common „ . .	21	1·058
Scotch ale, Class 1	40 to 44	1·111 to 1·122
„ „ 2	33 „ 40	1·092 „ 1·111
Porter (ordinary) .	18	1·050
„ (good) . .	18 to 21	1·050 to 1·058
„ (double) . .	20 „ 22	1·055 „ 1·060
Brown stout . .	23	1·064
„ (best)	26	1·072
Table beer . . .	12 to 14	1·033 to 1·039
Small „ (com.) .	6	1·017

EXPORTATION OF BEER:—When beer is exported from any part of the United Kingdom, either as merchandise or ships' stores, *the brewer or exporter* of such beer is allowed *a certain drawback* of duty. The amount is proportional to the quantity of malt or sugar, inferred to have been used in the brewing of the beer. Thus, if the original specific gravity of the worts from which the beer was brewed were not less than 1·040, a drawback is granted of *4s. 3d.* per barrel. This is equivalent to a return of the duty on 1¼ bushels of malt, with an allowance of *3d.* for licence duty, now charged in lieu of the abolished hop duty. For every additional 5 degrees of specific gravity, from 1040° to 1125° inclusive, a further sum of *6d.* per barrel is allowed.

[For further information connected with the above subject, the reader is referred to the separate articles—ALE, BEER, DEXTRINE, DIASTASE, FERMENTATION, MALT LIQUORS, PORTER, SACCHAROMETER, SPECIFIC GRAVITY, WORT, YEAST, &c.]

Brewing Uten'sils. The cleansing and preservation of brewing utensils, beer casks, &c., has frequently engaged the attention of practical men and brewers' chemists. To preserve them sweet they should always be thoroughly cleaned before setting them aside. Contact with soap, or any greasy material, should be carefully avoided. A scrubbing-brush and scalding-hot water are generally sufficient to clean them. Great care should be taken to remove every particle of yeast or fur on the sides and bottom; and after being well-drained, they should be stowed away in some clean and cold situation, properly exposed to the fresh air. Should they become tainted or mouldy, a strong lye of pearl-ash, common salt, or quicklime, may be spread over them, scalding hot, with a broom or scrubbing-brush. Washing them with oil of vitriol diluted with about 7 or 8 times its bulk of water, is another excellent and very effective method. Fresh-burnt charcoal has also been employed for the same purpose. In each case the vessels must be subsequently thoroughly washed out with clean water, as before. Steam, assisted by the action of a chain, has been successfully applied to clean casks in several breweries. Bisulphite of lime has, within the last few years, been highly recommended for sweetening and cleaning vats, casks, &c. It is also said to prevent beer from developing acidity. See CASKS, VATS, &c.

BRICKS. Brick-making scarcely comes within the province of this work. In connection with hygiene, however, we may call the reader's attention to the superior advantages of both hollow and waterproof bricks; the first, for ventilation and lightness; the last, for preserving the dryness and integrity of our homes under all the vicissitudes of climate, season, and weather, either on damp soils or dry ones. Workman's "Patent Waterproof Bricks" received a strong commendatory notice from the Commissioners of the "Great International Exhibition" of 1851.

BRINE (for Meat). *Prep.* 1. A nearly saturated solution of common salt, 1 lb.; and saltpetre, 1 oz.; in soft water.

2. To the last, add of sugar or
Bay-salt is recommended when t
be kept for a very long period.
LING, &c.

Brine, Red-Cabbage. Red-ca
steeped in a strong solution of
Used as a test for acids and alkal

Brine, Vi'olet. From the petal
violet, as the last. *Used* as a tes

BRIOCHE' PASTE (bre-ōsh').
a species of paste, or crust, pre
and flour, fermented with yeast
little salt, a large quantity of sug
half as much butter as the weigh
used, are afterwards added, and
in. *Used* as an addition to so
casing for lobsters, patties, eggs,

BRISK'NESS. The natural b
sparkling of fermented liquors de
gradual evolution of carbonic ac
the body of the fluid, by the pr
mentation. See MALT LIQUO
WINES, &c.

BRIS'TLES (brĭs'lz). The
swine, &c. They are commonly
immersion for a short time in
and are dyed by steeping them fo
in any of the common dyes used
wool.

BRITAN'NIA METAL (-y'ă).
TA''NIA. A superior species of
for teapots, spoons, &c.

Prep. 1. Plate-brass, bismuth,
tin, equal parts, melted together
sulting alloy added at discretion
until it acquires the proper deg
and hardness.

2. To the first alloy, prepared
add $\frac{1}{8}$th of its weight of metalli
fore mixing it with the melted ti

3. Antimony, 1 part; brass, 4
or 6 parts; melted together.
QUEEN'S METAL, PEWTER, &c.

BRIT'ISH GUM. See GUMS.

BRITISH WINES. See WIN

BROC'COLI. [Eng., L., Ger.
COLI, Fr.; BROCCOLO, It. A we
variety of cauliflower. The qual
mode of dressing broccoli, are si
of cabbages, noticed elsewhere.
TABLES (Culinary), &c.

BRO'MA. *Prep.* 1. Pure
sugar and sago-meal, of each,
British arrow-root (*i.e.* carefu
potato-starch) is often substitute

2. As the last, but using fine w
lieu of sago-meal. Made into a
similar way to cocoa.

BRO'MIDE (-mīd). *Syn.*
HYDROBRO'MATE*; BROMI'DUM
TUM, HYDROBRO'MAS, L.; BR
MURE, Fr. A chemical compoun
with another radical.

Prop., &c. The soluble b
white precipitates with nitrate
tate of lead, and protonitrate

the first of these is insoluble in
ic acid and in ammonia water
entrated; and it has a slight yel-
;, changing to a violet on exposure
t. A few drops of liquid chlorine
n a bromide, followed by agita-
e mixture with a little sulphuric
ishes an ethereal solution of bro-
r the other bromides see the re-
es.]

IE (-mīn). Br. *Syn.* Brome*;
Bromin′ium, L.; Brôme, Fr. An
substance, discovered by M. Balard,
lier, in 1826.

current of gaseous chlorine is passed
e uncrystallisable residuum of sea-
d bittern, which then assumes an
, in consequence of bromine being
n its combinations; sulphuric ether
itated with it, and the mixture is
stand, in a close vessel, until the
rtion floats upon the surface. This
ion of crude bromine, and for
rposes the ether may be at once
by a very gentle heat. To render
stic potassa is added in excess to
solution, or the latter is agitated
tion of potassa, by which means
bromate of potassium are formed.
is evaporated to dryness, and
o a dull red heat. The re-
ext powdered and mixed with
le of manganese; the mixture
placed in a retort, sulphuric acid
h half its weight of water) is
Red vapours immediately arise,
e into drops of bromine, which
by plunging the neck of the re-
o the bottom of a small receiver
little very cold water. The bro-
a stratum beneath the water, and
cted, and at once put into a stop-
; or, it may be further purified by
rom dry chloride of calcium.

A dark, reddish-coloured, vola-
aving an odour intermediate be-
of chlorine and iodine, but much
ating and offensive. It solidifies
°, and boils at about 145° Fahr.
soluble in water, more so in alco-
ndantly so in ether. Its aqueous
ches like chlorine, but less power-
hydrogen it forms hydrobro′mic
with the bases, compounds called
Its sp. gr. is 2·976; that of its
.

is readily recognised by its
, and volatility, and by the colour
r; by its giving a yellowish-white
with nitrate of silver, which is
t by the action of light; and by
giving an orange or yellow colour
d a red tinge to solution of chlo-

Bromine possesses very similar
roperties to iodine, and has been administered in goitre, scrofula, &c., in the form of an aqueous solution composed of 1 part of bromine to 40 of water, of which 5 or 6 drops is the dose; but it is more usually given under the form of bromide of potassium (which *see*). The solution has also been used as a lotion. It is very poisonous; the antidotes, &c., resemble those for iodine. See Bromide, Solutions, &c.

BRONCHI′TIS (brŏng-kī′-). [L.; prim. Gr.] In *pathology*, inflammation of the mucous lining of the bronchia or smaller ramifications of the windpipe. In its milder form it is popularly called a 'cold on the chest.'

Symp. The usual symptoms are hoarseness, dry cough, and a slight degree of fever, followed by expectoration of mucus, at first thin, and afterwards thick and copious. In the severer forms there is more fever, cough, and oppression at the chest, &c.

Treatm. It generally yields to small and repeated doses of ipecacuanha, and antimonial diaphoretics; a light diet and mild purgatives being at the same time adopted.

BRON′CHOCELE (brŏng′-ko-sēle). See Goitre.

BRONZE. [Eng., Fr., Ger.] *Syn.* Æs, L.; Bronzo, It. An alloy of tin and copper, remarkable for the exactness of the impressions which it takes by moulding and stamping, as well as for its great durability. It has hence been always extensively employed in the casting of buts, medals, statues, &c. In ancient times, when the manufacture of steel was ill-understood, cutting instruments were commonly made of it. It was also the general material of coins of small value; a use which, of late years, has been revived in several of the states of Europe, and still more recently in the coinage of these realms. Bell-metal, gun-metal, and speculum-metal, are mere varieties of bronze.

Prep. On the small scale, this alloy is prepared in crucibles; but for statues and larger works, on reverberatory hearths. The fusion of the mixed metals is conducted as rapidly as possible under pounded charcoal, and the melted mass is frequently stirred together to produce a perfect mixture, before casting.

The proportions of the materials so vary in different castings, that it is almost impossible to say precisely what quantities are the best. The following are given as examples:—

a. For Edge-tools:—Copper, 100 parts; tin, 14 parts. When skilfully hardened and tempered this alloy is capable of receiving an edge nearly equal to that of steel.

b. For Gilding:—1. Copper, 82 parts; zinc, 18 parts; tin, 3 parts; lead 2 parts.

2. From copper, 83 parts; zinc, 17 parts; tin, 2 parts; lead, 1 part.

c. For Medals:—1. Copper, 89 parts; tin, 8 parts; zinc, 3 parts. This alloy assumes a beautiful antique appearance by age, and takes *a sharp impression* by stamping.

2. (*M. Chaudet.*) Copper, 95 parts; tin, 4

or 5 parts. This is also excellent for any small castings.

d. For MORTARS:—Copper, 93 parts; lead, 5 parts; tin, 2 parts.

e. For STATUARY:—1. Copper, 88 parts; tin, 9 parts; zinc, 2 parts; lead, 1 part.

2. Copper, 82½ parts; zinc, 10½ parts; tin, 5 parts; lead, 2 parts. These are very nearly the proportions of the celebrated statue of Louis XV.

3. Copper, 90 parts; tin, 9 parts; lead, 1 part.

4. Copper, 91 parts; tin, 9 parts.

Obs. Several analyses have been made of ancient cutting-instruments, from which it appears that the proportion of tin varies from 4% to 15%; a fact which tends to prove that more depends on the exact mode of tempering the alloy, than on the relative proportions of the ingredients. Lead and zinc are inadmissible in bronze for this purpose. One or two per cent. of iron may, nevertheless, be added with advantage. The ancient bronze used for springs contained only 3% to 4% of tin. The edges and lips of bronze mortars must be carefully tempered by heating them to a cherry red, and then plunging them into cold water, as unless so treated they are very apt to be broken in use. See BELL-METAL, BRASS, GUN-METAL, &c.

Bronze'-powder. *Syn.* BRONZE. A name given to various powders having a rich metallic appearance, which they retain when applied on varnish, or when mixed with it, as in surface bronzing.

Prep. 1. GOLD-COLOURED:—*a.* From Dutch-foil, reduced to an impalpable powder by grinding. Cheap and looks well, and is very durable when varnished.

b. From gold-leaf, as the last.

c. Precipitated powder of gold.

d. From verdigris, 8 oz.; tutty-powder, 4 oz.; borax and nitre, of each 2 oz.; bichloride of mercury, ½ oz.; grind them together, make the mixture into a paste with oil, and then fuse it; when cold, roll it into thin sheets or leaves, and grind it as in No. 1.

2. IRON-COLOURED:—Plumbago, in fine powder.

3. RED:—Sulphate of copper, 100 parts; carbonate of soda, 60 parts; mix, and apply heat until they unite into a mass; then cool, powder, and add of copper filings, 15 parts; again well mix, and keep the compound at a white heat for about twenty minutes; lastly, when cold, reduce the 'residuum' to an impalpable powder, wash it in pure water, and dry it.

4. SILVER:—Bismuth and tin, of each, 1 oz.; melt them together, and add of quicksilver, 1 to 1½ oz.; when cold powder it.

Obs. The above are used by painters, japanners, &c. See BISULPHIDE OF TIN, POWDERS, &c.

BRONZ'ING. The process of giving a *bronze-like, or an antique* metallic appearance, to the surface of copper, bras
metals. The following methods
mended for this purpose:—

1. To the surface of the specim
roughly cleaned and polished, evenl
a brush, the common crocus-powde
rouge'), previously made into a
with water. When dry, place i
ladle, or on a common fire-shove
it over a clear fire for about
lastly, when sufficiently cold, pol
plate-brush. This gives a very
ance, similar to that on tea-urn
depending on the duration and t
heat employed.

2. As the last, but substituting
dered plumbago for crocus powd
beautiful, but deeper coloured a
manent than that produced by N

3. As the preceding, but emp
tures of plumbago and crocus in
portions, according to the shade d

4. A dilute solution of liver
(sulphurated potash), or of hyd
ammonia, is applied with a came
to the medal previously slightly w
dry, the surface is either lef
brushed off. If liver of sulph
used, it will be better to wash it
hot water; but without the sligh
This gives the appearance of
bronze.

5. Verdigris, 2 oz.; and sal-amm
are dissolved in vinegar, 1 pint;
ture is diluted with water, until i
slightly metallic, when it is boil
minutes, and filtered for use. Co
&c. (thoroughly clean), are ste
liquor at the boiling-point, until
effect is produced. Care must be
keep them in it too long. Wh
they are carefully washed in ho
dried. Effect as the last.

6. Verdigris and vermilion, of
alum and sal-ammoniac, of each,
fine powder); vinegar, q. s. to
paste. This is spread over the
copper, which is then uniforml
the fire, and afterwards well wash
The tint may be deepened by
process. The addition of a littl
inclines the colour to a chestnut-
little borax to a yellowish-brown.
Chinese for copper tea-urns, &c.

7. Sal-ammoniac, 1 oz.; cre
3 oz.; common salt, 3 oz.; hot
dissolve; then add of nitrate of
dissolved in ½ a pint of water;
with it repeatedly moisten the a
in a damp situation), by means of
Produces a very antique appeara

8. Salt of sorrel, 1 oz.; sal amr
distilled vinegar, 1 quart; disso
last. Much used for bronze figu

9. A very weak solution of
platinum, applied with a hair pe

binding screws, holders,
les of copper and brass.
m and sulphate of copper,
r, 1 pint; dissolve; wash
articles with it; let them
olution of verdigris, 2 oz.;
inegar, ½ pint; when dry,
oft brush, and either some
ar. Used for tin castings.
properly cleaned) are either
shed over, with a solution
per or of verdigris. In a
equire a coating of pure
nd are then washed. This
iron and steel goods. It is
r iron castings.

appearance may be given
r exposing it to the fumes
of ammonia, or immersing
time in a solution of hydro-
nia, or in dilute nitric acid.

ng. A term commonly ap-
cess of imparting a bronze-
ppearance to the prominent
surfaces of figures made of
ster of Paris, &c. It is ef-
ring them a coat of oil-varnish
n this is nearly dry, applying,
' of cotton, or a camel-hair
the ordinary metallic bronze-
referred to. Sometimes the
d in a little bag of muslin,
r the surface. The articles
wards varnished.

ased by mixing the bronze-
h a little weak gum-water, and
surface when dry and hard.

e common name of the plant
i'rium.

a. From broom-stalks burnt.
as a diuretic in dropsy.

; of. Obtained by dissolving
water, and filtering and evapo-
tion. It consists principally of
tassa. It was formerly used in
as antacid, &c.

CORAIL. [Fr.] The root of
go sati'va), cleaned, dried, and
the end. Used as a tooth-

n. Jus (coctis carnibus), Jus'-
OUILLON, Jus, Fr.; FLEISCH-
In *cookery*, the liquor in which
oiled. Broth is distinguished
its inferior strength and quan-
ng, &c. It contains much of
of the meat. See BOILING,

E. Every shade of brown may
lmost at will, by mixtures of
ws with blues and blacks; or
ple dyes. The following are

ON:—
goods a mixed mordant *of ace-*
s and *acetate of iron, followed* by a bath of madder or of madder and fustic. Excess of acetate of alumina turns it on the AMARANTH TINT; the acetate of iron darkens it.

2. First 'gall' the goods, then turn them for a short time through the black bath; next give them a mordant of sulphate of copper, then pass them through a decoction of fustic, afterwards through a bath of madder, and again through the solution of sulphate of copper; drain, dry, rinse well, and finish with a boil in soap and water. This gives a CHESTNUT-BROWN,

3. First give the goods a mordant of alum, then a bath of madder, and next a bath of fustic to which a little green copperas has been added. This gives a CINNAMON-BROWN.

b. For LINEN:—This varies little from that commonly employed for cotton.

c. For SILK:—

1. One of the above mordants is followed by a bath made by mixing equal parts of the decoctions of logwood, fustic, and Brazil-wood, The shade may be varied by altering the proportions of the decoctions; Brazil-wood reddening, logwood darkening, and fustic yellowing, the tint.

2. Annotta, 4 oz.; and pearlash, 1 lb.; are dissolved in boiling water, q. s.; the silk is passed through it for two hours, then taken out, and squeezed dry; it is next passed through a mordant of alum, and then through a bath of Brazil-wood, followed by another of logwood to which a little green copperas has been added.

d. For WOOL:—

1. Boil the cloth in a mixed mordant of alum, common salt, and water, then dye it in a bath of logwood to which a little green copperas has been added. 2 oz. of alum, and 1 oz. of salt, are required for every lb. of wool.

2. Boil the goods in a mordant of alum and sulphate of iron, then pass them through a bath of madder. The more copperas the darker will be the die. Good proportions are 2 parts of alum and 3 of copperas.

3. Give a mordant of alum and tartar, then pass the goods through a madder bath; next run them through a bath of galls and sumach or logwood to which a little acetate or sulphate of iron has been added.

4. Mordant the cloth as last, dye in a madder bath, remove the cloth, add a little acetate or sulphate of iron, and again pass it through the bath, as long as necessary.

5. Give the cloth a light blue ground with indigo, and then a mordant of alum; rinse, and lastly run it through a bath of madder.

6. A mordant of alum and tartar, followed by, first a bath of madder, and afterwards a bath of weld or fustic to which a little iron-liquor has been previously added. In this way every shade, from MORDORÉ and CINNAMON *to* DARK CHESTNUT, may be produced.

7. Boil *fustic-chips*, 1 lb., for 2 hours; pass

the cloth through the bath for 1 hour; take it out and drain; add of green copperas, 1¼ oz.; good madder, 4 oz.; boil for a short time, and again pass the cloth through the bath, until it acquires the proper tint. BRONZE-BROWNS, and every similar shade, may be thus given by varying the proportions.

e. The following are called SUB'STANTIVE or DIRECT BROWNS:—

1. *Decoction of oak-bark.* It dyes wool of a fast brown of various shades, according to the quantity employed. A mordant of alum brightens it.

2. *Infusion* or *decoction of walnut-peels.* Dyes wool and silk a brown, which is brightened by alum.

3. *Horse-chestnut-peels.* A mordant of chloride of tin turns it on the BRONZE; and sugar of lead, on the REDDISH-BROWN.

4. *Catechu* or *Terra Japonica.* For cottons. Blue vitriol turns it on the BRONZE, and green copperas darkens it, when applied as mordants. Acetate of alumina as a mordant brightens it. The French colour, CARMELITE, is given with 1 lb. of catechu, 4 oz. of verdigris, and 5 oz. of sal-ammoniac.

5. *Sulphate or chloride of manganese.* Dissolved in water with a little tartaric acid, it gives the bronze tint called SOLITAIRE. The stuff, after being passed through the solution, is turned through a weak lye of potash, and afterwards through another of chloride of lime, to heighten and fix it.

6. *Prussiate of copper.* This gives a fine BRONZE or YELLOWISH-BROWN to silk. A mordant of blue vitriol is commonly first given, followed by a bath of prussiate of potash.

BROWN PIG'MENTS. The principal and most useful of these are—*umber*, *terra di Sienna* (both burnt and raw), *Spanish brown*, and some of the *ochres*. Brown, of almost any shade, may be made by the admixture of blacks with reds and yellows, or with greens, in different proportions. See BISTRE, NEWCASTLE-BLACK,[1] OCHRES, SEPIA, &c.

Span'ish Brown. See OCHRES.

BROWN PINK. See YELLOW PIGMENTS.

BROWN'ING. In *cookery*, a fluid preparation used to colour and flavour gravies, soups, &c.

Prep. 1. Sugar, 4 oz.; and butter, 1 oz.; are melted in a frying-pan or ladle with about a tablespoonful of water, and the heat is continued until the whole has turned of a deep brown; the heat is then lowered a little, and some port wine (about 1 pint) is gradually poured in; the pan is now removed from the fire, and the mixture well stirred until the roasted sugar is entirely dissolved; it is then put into a bottle, and ½ oz. each, of bruised pimento and black pepper, 5 or 6 shalots (cut small), a little mace and finely grated lemon-peel, and ¼ pint of mushroom catsup, added. The bottle is shaken daily for a week, and the clear liquid, after 5 or 6 days' repose, decanted into another bottle. Rich-flavoured,
pensive.

2. As the last, but using strong
water, instead of wine. A glassful
may be added after bottling it.

3. Sugar-colouring 1 pint; salt,
mushroom-catsup, ½ pint; spice, q.
cellent for all ordinary purposes.

4. Lump sugar (powdered), 2½ lbs.
oil, ½ lb.; heat as before; then add,
wine, 1 quart; Cape wine, 3 quarts;
6 oz.; mixed spice, 4 oz.; black pepper,
mace, 1 oz.; salt, 1 lb.; lemon juice,
catsup, 1 quart; mix well.

5. Good spirit-colouring or sugar-
and mushroom-catsup, of each, 1
maica pepper, black pepper, and
each, 4 oz.; cloves, cassia, and mace,
of each ¾ oz.; boil in a covered vessel
minutes; digest for 14 days, and strain.

6. Colouring, 3 pints; mushroom-
pint; common salt, ¾ lb.; Chili
(strongest), ½ pint; spice, q. s. Half a
British brandy or rum may be added.

Obs. The above are excellent additi
gravies, soups, &c.; and of themselves
most admirable sauces for fish, meat,
game.

Browning (for Gun-Barrels). *Prep.*
following are current formulæ:—

1. Blue vitriol, 4 oz.; tincture of
iron, 2 oz.; water, 1 quart; dissolve,
aquafortis and sweet spirit of nitre, of
1 oz.

2. Blue vitriol and sweet spirit of
each, 1 oz.; aquafortis, ½ oz.; water, 1
as last.

3. Butter of antimony and sweet oil,
parts; well shaken together. To be
to the iron previously warmed.

Obs. The above fluids are rubbed
barrel (previously well polished and
off with whiting to remove the oil),
allowed to remain on for some hours, or
the next day, when they are rubbed off
a stiff brush. The process may be
if necessary. The barrel is next
water in which a little pearlash or
been dissolved, and afterwards well
clean water; it is then polished, either
the burnisher, or with a brush and bees'
Sometimes a coat of tough shellac
applied.

BRU'CEA* (-sh'ă). False cusparia (
see).

BRU'CIA. $C_{23}H_{26}N_2O_4 . 4 Aq.$ [Eng
Syn. BRU'CINE; BRU'CINA, L. An alkalo
covered, by Pelletier and Caventou,
bark of *bru'cia antidysenter'ica*, and after
associated with strychnia, in *nux vomica*

Prep. Ground nux vomica, or the
brucia antidysenterica, is boiled in dilu
phuric acid, and the resulting decoction
with hydrate of lime (in excess); the
precipitate thus obtained is boiled in
(sp. gr. ·850), and the tincture filtered

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[1] Under BLACK PIGMENTS.

re of crude strychnia and brucia
the fluid cools, and the remainder
evaporation. This is powdered
in cold alcohol, which dissolves
; the solution furnishes crystals
s evaporation. It may be further
-crystallisation from alcohol.
uble in 850 parts of cold, and
rts of hot water; freely soluble
ded to the dilute acids until they
ed, it forms crystallisable salts,
d by evaporation.
is distinguished from strychnia,
any respects it resembles, by its
lity in both dilute and absolute
its insolubility in ether. With
t strikes a fine red colour, which
y sulphuretted hydrogen and sul-
d. Iodic acid, chloric acid, and
o turn it red.

(brōōze). *Syn.* Contu'sio, Con-
Contusion, Meurtrissure, Fr.;
Quetschung, &c., Ger. A con-
t in popular language applied
ses in which there is an extravasa-
od owing to the rupture of the
els, with consequent discoloration
tion of the part.

In common cases, sufficiently
uises may be rubbed with a little
r soap-liniment; or, if the inflam-
considerable, they may be bathed
ttle weak goulard water, or with
d water. In more severe cases
y be applied. See Contusion.

WICK BLACK. See Varnishes.

WICK GREEN. See Green Pig-

IN (-nin). A peculiar bitter prin-
ted from the root of white bryony
sica, Jacq.). It is obtained from
ract of the expressed juice, by so-
alcohol, filtration, and cautious

. A yellowish-white mass. It is
urgative; and, in large doses,
It enters into the composition
ack medicines.

AND-SQUEAK. In *cookery*, a
lla podrida variously prepared, as
ls and fancy of the maker dic-

Rundell.) Take slices of cold meat,
ickly until brown, and put them
o keep them hot. Then clean the
e fat; put in it greens and carrots
boiled and chopped small); add a
, pepper, and salt; make them
d put them round the beef with a
Cold boiled pork is a better ma-
ubble and squeak than beef. In
he slices should be very thin and

FEVER†. See Pemphigus.

(-kū). The plant *dios'ma crena'ta*

BUCK'THORN. *Syn.* Rham'nus, L. The *rham'nus cathar'ticus* (Linn.). Berries (bac'cæ rham'ni, L.), cathartic; juice of the berries (suc'cus r., L.) is officinal in the B. P. See Rhamnine, Syrups, &c.

BUCK'WHEAT. See Wheat.

BUG. *Syn.* Ci'mex, L.; Punaisé, Fr.; Wanze, Ger. A name popularly and very loosely applied to a vast number of insects that infest houses and plants; in *zoology*, hemipterous insects of the genus 'cimex,' of which there are many hundred species; *appr.*, the bed-bug.

Bug. *Syn.* Bed'-bug, House'-b., Wall-b., Wall'-louse*, &c.; Ci'mex domes'ticus, C. lectula''rius (Linn.), L.; Punaise, Fr.; Bettwanze, Hăuswanze, Ger. An insect too well known in all the larger towns of Europe and America, and in the huts of squalid poverty everywhere, to require a description here. It is almost the only species of the bug-kind that has undeveloped wings. Its introduction to England is believed to have occurred soon after the great Fire of London (A.D. 1666). Human blood appears to be its favourite food; but it will also eat grain, seed, flour, dried paste, size, soft deal, beech, osier, &c. Cedar, mahogany, and the odorous and harder woods, are usually avoided by this insect. Aromatics, perfumes, and strong odours generally, are unfavorable to its propagation.

Exterm., *&c.* Various means have been adopted to prevent the accession, and to destroy or drive away, these enemies of "tired nature's sweet restorer, balmy sleep." Among the most certain of these is thorough cleanliness, and ventilation. The furniture brokers put articles infested with these insects into a room with doors and windows fitting quite close, and subject them to the fumes of burning sulphur or chlorine gas. In the small way, poisonous washes are commonly resorted to. For this purpose nothing is more effective than chloride of lime or chloride of zinc; the latter being preferable to the other on account of its being comparatively scentless.

The following mixtures are in common use, or have been recommended for this purpose:—

1. Corrosive sublimate (in powder) and hydrochloric acid, of each, 1 oz.; hot water, ¾ pint; agitate them together until the first is completely dissolved. It is applied with a paint-brush, observing to rub it well into the cracks and joints. This is the common 'bug wash' of the shops. It is a deadly poison!

2. As the last, but substituting 2 oz. of sal-ammoniac for the hydrochloric acid.

3. Oil of turpentine, 1 pint; camphor, 2 oz.; dissolve. Very cleanly and effective.

4. Tobacco-water, made by steeping 2 oz. of good shag in 1 pint of warm water, for a few hours.

5. Crude pyroligneous acid.

6. Coal-tar naphtha. This, as well as No. 3 *(above) should never be* used by candle-light, *as it is excessively* inflammable. When the

smell of the common naphtha is objectionable, benzol or benzine may be used instead. The celebrated nostrum vended under the name of "Insecticide" is said to be nothing but benzol.

7. Sulphurated potash (in powder), 6 oz.; soft soap, ½ lb.; oil of turpentine, ¼ pint, or q. s. to make a species of soft ointment. The odour of the last three (Nos. 5, 6, 7) is rather persistent and disagreeable; but they are very effective.

8. Strong mercurial ointment, soft soap, and oil of turpentine, equal parts, triturated together. Rather greasy and dirty.

9. Scotch or Welsh snuff, mixed with twice its weight of soft soap.

10. Sulphur, or squills, in impalpable powder, blown into the cracks or joints, or scattered in a fine cloud, by means of a hollow ball or balloon of vulcanised India rubber filled with it and furnished with a small wooden jet or mouth-piece, or in any other convenient manner. Very cleanly and effective. Dumont's 'Patent Vermin Killer,' as well as the whole host of imitations of it, is of this kind.

Obs. Out of the above list there is ample room for selection. The common practice is to take the bedstead, or other piece of furniture, to pieces, before applying them.

These pests exist only in dirty houses. A careful housewife or servant will soon completely destroy them. The surest method of destruction is to catch them individually when they attack the person in bed. When their bite is felt, instantly rise and light a candle and capture them. This may be troublesome, but if there be not a great number a few nights will finish them. When there is a large number, and they have gained a lodgment in the timbers, take the bed in pieces, and fill in all the apertures and joints with a mixture of soft soap and Scotch snuff. A piece of wicker-work, called a BUG-TRAP, placed at the head of the bed, forms a receptacle for them, and then they may be daily caught till no more are left. Oil-painting a wall is a sure means of excluding and destroying them. It has been asserted that these insects are so fond of narrow-leaved dittany or pepperwort (*lepidium ruderale*), that if a bunch of it be suspended near their haunts, they will settle in it, and may be thus easily captured. It is said to be commonly used as a bug-trap in some of our rural districts. Water, poured boiling from the spout of a kettle into the cracks and joints, is a cleanly and certain remedy, which we have often seen employed; so also is a jet of steam; they are both destructive to all insects, and will be found particularly so to beetles.

The proper time for attacking these pests is early in March, or shortly before they are revived from their dormant state by the warm weather. See INSECTS.

Har'vest Bug. See ACARI.

BU'GLE (bu'gl). An elongated cylindrical *glass bead.* See BEAD.

BUN'ION (-yŭn). A species
swelling on the ball of the great
from pressure, and irritation by f
treatment recommended for corn
to bunions; but in consequence o
extension of the disease, the
tedious. A bunion may often b
stopped and removed by poulticin
the proper time, carefully openi
lancet. See CORNS.

BUN. A well-known kind of
cake.

Prep. 1. BATH-BUNS:—As 6,
little candied lemon and orange p
ting a little grated peel and a
comfits on the top of each.

2. CROSS-BUNS:—Flour, 2½ lbs.;
½ lb.; coriander seeds, cassia,
each (powdered), q. s.; make a
butter, ½ lb.; (dissolved in) hot
work with three table-spoonfuls
it before the fire for an hour to ri
it into buns, and set them before
tin for half an hour; lastly, brus
with warm milk, and bake them to
in a moderate oven.

3. MADEIRA-BUNS:—Butter, 8
flour, 1 lb.; powdered sugar, 6
nutmeg (grated); powdered ging
way seeds, of each, ½ teaspoonful
together, then add as much milk
and ferment; lastly, bake on tins
oven.

4. PLAIN BUNS:—Flour, 2 lbs.;
sugar, 6 oz.; a little salt, caraway,
make a paste with yeast, 4 sp
warm milk, q. s.; as before.

5. PENNY-BUNS:—To the last
rants, well washed, ½ lb.; and w
by steeping a little saffron in it, q.
light yellow tinge to them.

6. RICH BUNS:—Fine flour, 3
1 lb.; butter, 2 lbs. (melted, and
rose water, 4 oz.; currants, 1 l
pint; as before.

Obs. The great secret in pro
buns is, the use of sweet yeast
currants only, and thoroughly w
last in a sieve or colander, to
before adding them to the dough.

BURG'LARIES. The common
of locks and bolts, alarum-bells a
are frequently found useless i
houses from burglars; but a light
part of the house, or a small
ground-floor, with the means of
a place of safety from its enem
seldom known to fail. A combin
two would undoubtedly be dou
The bark of the dog, and the fear
by the approach of the light, wo
majority of rogues of commo
feeling. A dog out of doors, and
accessible, however large and fi
pacified or silenced by men of
ferred to.

d **Scalds.**[3] *Treatm.* When the
ficial and slight, a little creosote
d to the part. If a scald, the
be first pierced with a needle,
ter, snipped with a pair of scis-
rater which it contains should be
queezed out. When creosote is
e, a liniment formed of equal
soap, basilicon ointment, oil of
d water, may be used instead.
rt feels very hot and painful, a
be applied, on the surface of
trops of creosote, or of the lini-
be spread with a knife. This
l generally succeed in allaying
may be followed by a dressing of
tment, or any other like simple
unctuous preparation. Creosote,
what is commonly asserted, pro-
any smarting or pain; whilst it
res the burning sensation, and
urface soon assumes a dry scabby
which, by dressing with simple
a comes off and leaves the part
sound and healthy state. If a
plied it is best to keep it on until
Plunging the part into very cold
iately after the receipt of an
kind, will frequently prevent any
dy being required. In all cases
ives should be administered; and
ld be rather low until the inflam-
toms subside.

-GLASS. See LENS.

ONDOSA, *Roxb.* (Ind. Ph.) *Syn.*
O TREE. *Habitat.* Common all
—*Officinal part.* The inspissated
d from the stem by incision (*Bu-*
, *Kino Bengalensis, Bengal kino*).
the form of irregular shining frag-
m as large as a pea; more or less
adherent pieces of grayish bark;
e ruby colour and astringent taste;
t not freely so, in water and in
astringency is due to the presence
and gallic acids.—*Prop. & Uses.*
those of kino, for which it has been
ficient substitute.—*Prep.* Same as
no.

R. [Eng., Ger.] *Syn.* BUTY'RUM,
u, Fr.; BUTER, BUTERA, Sax. The
r obtained from cream by churn-

The process of making butter by
a operation of churning is extremely
l is well known. The chief objects
to, are maintaining a proper tem-
d a certain degree of exposure to
Extreme cleanliness must also be
the churn and other utensils being
scalded out with water. When the
me,' it should be put into a fresh-
, or tub, which has been standing in cold water, cold water poured on it, and after it has acquired some hardness, it should be well beaten with a flat board until not the least taste of the buttermilk remains, and the water, which must be often changed, becomes quite colourless and tasteless. A little salt may then be worked into it; after which it may be weighed and made into 'forms,' which should then be thrown into cold water contained in an earthen pan provided with a cover. In this way nice and cool butter may be obtained in the hottest weather.

At *Dumbarton*, the newly separated butter is put into a clean vessel, and a corn sickle is drawn several times crosswise through it, to extract any hairs that may adhere to it. This operation is performed in very cold spring water, and is followed by thoroughly washing it therein. 10 oz. of salt are now added to every stone-weight[4] of the butter, and well mixed in.

In *Devonshire*, the milk is generally scalded in copper pans over a charcoal or wood fire, and the cream collected as soon as it rises, or, and more frequently, when the whole has got cold. It is then churned in the usual way. On the small scale, the butter is commonly obtained from this cream by patiently working it with the hand in a shallow pan or tub. Without care the cream is apt to absorb some of the fumes from the charcoal, which impart a peculiar taste to the butter. This is the reason why some of the Devonshire butter has a slight smoky flavour. It may be removed by thorough washing in cold water. Of late years, in the large dairy-farms of Devonshire, covered flues, with openings to receive the bottoms of the pans, have superseded open fires, by which the danger of contamination from the fumes is removed.

Choice. Fresh butter has a pleasant odour and is of an equal colour throughout its substance. If it smells sour, the buttermilk has not been well washed out; and if it is streaked or veiny, it is probably mixed with stale butter or lard. A good way to try butter is to thrust a knife into it, which should not smell rancid and unpleasant when withdrawn. Rancid and stale butter, when eaten in quantity, is capable of producing dangerous symptoms.

Pur. The cheaper kinds of butter are frequently adulterated with common wheat-flour, oatmeal, pea-flour, lard, &c., as well as with a large quantity of salt and water. The trick is concocted between the Irish factors and the London dealers. The higher priced article is seldom mixed with anything beyond an excess of salt and water, notwithstanding the assertions of alarmists to the contrary. The presence of lard may be detected by the flavour and paleness of the colour. A little of the sample adulterated with the other substances named, if melted in a glass tube or phial, will *separate into strata*, which are very marked *when cold.*

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ding.; AMBUS'TIO, L.; BRÛLURE, Fr.;
NNARE, Ger.
e (under St).

Preservation. 1. Melt the butter in a stoneware or a well-glazed earthen pan set in a water bath at a heat not exceeding 180° Fahr., and keep it heated, skimming it from time to time, until it becomes quite transparent; then pour off the clear portion into another vessel, and cool it as quickly as possible, by placing the vessel in very cold water or ice. This is the method employed by the Tartars who supply the Constantinople market. In this state it may be preserved perfectly fresh for 6 or 9 months, if kept in a close vessel and a cool place. This is the plan so strongly recommended by M. Thènard. Mr. Eaton states that butter melted by the Tartarian method, and then salted by ours, will keep good and fine-tasted for two years.

2. Saltpetre and white sugar, of each, 1 oz.; best Spanish great-salt (or Cheshire large-grained salt), 2 oz.; all in very fine powder; mix thoroughly, and add 1 oz. of this mixture to every lb. of butter, and thoroughly incorporate them together. The butter thus prepared is then to be tightly pressed into clean glazed earthenware vessels (or well-seasoned casks), so as to leave no vacuities. This plan is recommended by Dr. Anderson, who declares that "butter so prepared will keep in a cool place for years; and will bear a voyage to the East Indies, if packed (stowed) so as not to melt." It does not taste well before it has stood for three or four weeks, after which it acquires a rich marrow-like flavour, which no other butter ever possesses. A good method to preserve the butter from the air, is to fill the pots to within an inch of the top, then to lay on it some coarse-grained salt to the depth of a ¼ to ½ an inch, and lastly to cover each pot with a slate, plate, or other flat article. The salt by long keeping runs to brine, which forms an air-tight layer on the top of the butter, and may at any time be very easily removed by turning the pot on one side.

3. Fresh butter, 21 lbs.; salt, 1 lb.; saltpetre, 1 oz. These are the common proportions for the best salt butter of the shops.

4. Fresh butter, 18 lbs.; salt, 1 lb.; saltpetre, 1½ oz.; honey or fine brown sugar, 2 oz. Superior to No. 3.

Concl. remarks. It may be useful to know that *rancid butter* may be restored, or, in all cases greatly improved, by melting it in a water bath with some fresh-burnt and coarsely powdered animal charcoal (which has been thoroughly freed from dust by sifting), and straining it through clean flannel. A better and less troublesome method is to well wash the butter first with some good new milk, and next with cold spring water. Butyric acid, on the presence of which rancidity depends, is freely soluble in fresh milk.

The turnip-flavour, arising from the cows being fed on turnips or cabbages, is said to be removed by one or other of the following *methods:*—1. When the milk is strained into the pans, put to every 6 galls., 1 gal. of boiling water.—2. Dissolve 1 oz. of
spring water, and put a ½ pint
to every 15 galls. of milk.—
½ pint of the sour cream when
put it into a well-scalded pot,
are to gather the next cream
and do so with every fresh ad
these methods come on good a
are bound to say, that our own
not confirm their constant su
found that the addition of a h
the water used to wash the b
a plan as any.

Butter, Ancho'vy. From a
and beaten to a paste), 1 part;
spice, q. s.

Butter, Clar'ified. Fresh bu
water bath, allowed to settle
portion poured into an earth
pot, set in cold water, so as
quickly as possible, without
crystallise. It keeps a long t
coming rank. See BUTTER, N

Butter, Hon'ey. Fine Narb
4 oz.; mixed with good butter,
delicacy for children, and by th

Butter, Lem'on. See ORAN

Butter, Melt'ed. This well-k
be prepared of excellent quali
Beat up about 1 oz. of fine flo
butter, in the cold, until they
thoroughly mixed, then add
spoonfuls of hot milk, put t
small saucepan, and continue
in one direction, until it simm
lastly, remove it from the fi
into the butter-boats for us
should be filled with hot w
emptied and wiped dry, befo
melted butter into them. See

Butter, Or'ange. *Prep.* 1.
oz. of powdered sugar, and
well beaten together with
flower water. Sometimes 1 or
almonds, or of almond-paste, i
2. Butter, 1 lb.; syrup of o
Both are eaten as a delicacy.
is made in a similar manner.

Butter of An'timony*‡. T
timony.

Butter of Caca'o. See Co'c
NUT OIL.

Butter of Nut'megs. Coll
surface of the water in the st
tillation of the essential oil of

Butter of Ro'ses. Obtain
damask roses. It separates
water in the receiver. It has
is hence used to dilute the odo
bergris, and civet.

Butter of Wax. Prepared b
wax. A factitious kind is also

Butter of Zinc*‡. Chloride

BUT'TER-MILK. The liq
after the butter is separated f
Qual., &c. Butter-milk

t cream is not only very de-
:edingly wholesome and nu-
ten with fruit, puddings, and
id to possess the property of
vous irritability induced by
nking. It is an admirable
:ets, diabetes, and many sto-
An American physician has
d that it induces longevity.

See Brass, Gilding, &c.
[Eng., Fr.] *Syn.* Bu'tyras,
hich the hydrogen of butyric
by a basic radical.
arium. *Prep.* Saponify butter
solution of caustic alkali, and
resulting soap by adding a so-
ic acid; filter and distil; neu-
llate with hydrate of barium,
the first crystals that form
barium; the next, caproate of
the last, butyrate of barium.
y soluble in water, and hence
:ated from the others.—*Use.*
king butyric acid.
(-tīr'-) *Syn.* Butyr'icus, L.;
r. Of or from butter.
ACID. $HC_4H_7O_2$. *Syn.* Acidum
L.; Acide butyrique, Fr.;
, Ger. An oily acid, first ob-
vreul, from butter.
a butyrate of barium or magne-
ing sulphuric acid in quantity
icient to decompose the whole of
e clear liquid filtered, and dis-
butyric acid, from which the
: removed by digestion with chlo-
m.
thin colourless liquid, of pungent
t, and sour taste, miscible with
lcohol. It boils and distils un-
327° Fahr. Sp. gr. ·963. See

(-in). [Eng., Fr.] An oily
isting in butter, and of which it
haracteristic portion. It was dis-
Chevreul.
keep clarified butter in a porcelain
heat of 66°, for some days; care-
t the oily portion which separates,
an equal weight of alcohol of the
, and agitate it frequently for 24
er repose pour off the clear portion,
ate it; treat the oily residuum with
rbonate of magnesium, to remove
and wash off the butyrate of mag-
us formed, with water; lastly, heat
ing fatty matter in alcohol, filter,
ate, by a gentle heat; the residuum

(-in). An alkaline substance, de-
Faure, in *bux'us semper'virens,*
on box-tree.

Syn. *Bras'sica, L.; Chou,*
&c. This common esculent, and all its numerous varieties, are merely cultivated specimens of the wild sea-cabbage of our coasts (*bras'sica olera'cea,* Linn.), one of an extensive and valuable genus of plants belonging to the *nat. ord.* Cruciferæ. After the potato, the cabbage is doubtless more extensively used by the masses of the people, than any other fresh vegetable. When young, and properly dressed, it forms an agreeable and wholesome addition to animal food, the grossness of which, it is said, it tends to correct. It should be eaten only when fresh gathered and fresh cooked; and the unconsumed portion, as well as the water in which it has been boiled, should be at once thrown away. Persons troubled with a weak digestion, or who have a tendency to flatulence, diarrhœa, or worms, would do well to avoid them. Their use is particularly serviceable in scurvy, and in numerous skin diseases.

It has been asserted that cabbages, cauliflowers, broccoli, celery, and several other culinary vegetables, may be preserved in a fresh state for some time, by cutting them so that they may have about two inches of stem left below the leaves, scooping out the pith as far down as a small knife will reach, and then suspending them perpendicularly by means of a cord, in an inverted position, in some cool situation, and daily filling up the bottom part of the stem with clean cold water. In this way it is stated that a supply of green vegetables may be readily obtained during a severe winter, and on ship-board. Other methods, including those usually adopted with the same object, are noticed under Vegetables (Culinary).

Cabbages, broccoli, &c., are dressed by simply throwing them into boiling water, and simmering them until tender. A few minutes is sufficient for this purpose. A pinch of salt of tartar, or of carbonate of soda, is commonly added to the water, to preserve the green colour of the vegetables.

CACHOU AROMATISÉ (kăshoo ărŏmătēză). [Fr.] A mouth-lozenge intended to sweeten and perfume the breath. Preparations of this description are much used by smokers and bacchanals. The form under which they are generally prepared for sale, is that of 1½ to 2 gr. pills, neatly silvered. Originally they were composed chiefly of catechu and sugar, flavoured and perfumed with the stronger aromatics; but at the present day the catechu, from which they derive their name, is not unfrequently omitted. Their preparation is described elsewhere. See Breath, Lozenges, Pastils, &c.

CAD'MIUM. Cd. [Eng., L.] *Syn.* Klapro'thium. A metal discovered by Stromeyer and Hermann, in the ores of zinc.

Prep. 1. (Stromeyer.) The cadmo-zincic ore is dissolved in an excess of dilute sul*phuric or hydrochloric acid,* by heat; a stream *of sulphuretted hydrogen* is passed through *the solution, the* resulting precipitate (sulphide of cadmium) dissolved in nitric acid, and the solution evaporated to dryness; the residuum is dissolved in water, the solution precipitated with carbonate of ammonium in excess, and the precipitate (carbonate of cadmium) collected, mixed with charcoal, and heated to redness in a crucible apparatus so arranged as to condense the fumes; the cadmium sublimes.

2. (Wollaston.) A solution of the ore obtained as above is placed in a platinum capsule, and a piece of metallic zinc is plunged into it. In a short time the cadmium is precipitated, and attaches itself to the sides of the capsule, when it is collected, washed, and dried.

3. (Herapath.) When zinc is obtained by distilling its ores, *per descensum*, the first portion of the metallic fumes evolved burn with a brownish flame, and deposit oxide of cadmium, which is subsequently reduced by distillation with charcoal. Thousands of pounds of cadmium are yearly wasted at the zinc works which might be easily collected in a similar manner.

Prop., &c. Resembles tin in most of its physical properties, being white, soft, and malleable. Sp. gr. 8·61. Stromeyer gives its melting-point as 442° Fahr., but Dr. Wood, an American chemist, states that the metal requires for its fusion nearly the same heat as lead, and gives it as about 600° Fahr. It volatilises at a somewhat higher temperature, giving off orange-coloured, suffocating fumes, which, when inhaled too freely, leave a disagreeable, sweetish, styptic sensation upon the lips, and a persistent brassy taste in the mouth, with constriction of the throat, heaviness in the head, and nausea. The alloys of cadmium are said to be brittle, by almost all who have treated of them, but Wood found that many were extremely tenacious, as, for instance, the combination of 2 parts of silver and 1 part of cadmium, which is perfectly malleable and very strong. The amalgam of equal parts of cadmium and mercury is also highly malleable. Like bismuth, cadmium has the property of promoting fusibility in certain alloys; thus, a remarkable fusible metal may be formed by melting together cadmium 1 to 2 parts, lead 2 parts, and tin 4 parts.

Tests. Its ores and salts are recognised as follows:—1. Mixed with carbonate of sodium, and exposed on a charcoal support to the reducing flame of the blowpipe, the charcoal becomes almost instantly covered with a reddish-yellow incrustation of oxide of cadmium, commonly forming a circle or zone.—2. Caustic soda and potassa give a white precipitate (hydrated oxide) in solutions containing cadmium, insoluble in excess of the precipitant.—3. Ammonia gives a similar white precipitate, freely soluble in excess.—4. The alkaline carbonates give white precipitates (carbonate of cadmium), insoluble in excess.—5. Sulphuretted hydrogen, and sulphydrate of ammonium, give a *bright yellow* precipitate (sulphide of cadmium), which is insoluble in d
kalies, sulphides, and cyanide
but readily soluble in both hyd
and nitric acid, especially with
salts of cadmium are readily disti
those of arsenic, by the precipi
being insoluble in ammonia, and
drochloric acid, and being capab
ing a white heat without sublim

Cadmium, Car'bonate of. CdC
MII CAR'BONAS, L. From a soluti
or chloride of cadmium, and an al
ate; the precipitate being coll
and dried by a gentle heat. A

Cadmium, Chlo''ride of. CdC
DROCHLO''RATE OF CADMIUM,
CADMIUM; CAD'MII CHLORI'I
HYDROCHLO''RAS, L. *Prep.*
dissolving carbonate or oxide o
hydrochloric acid, and crystallis
evaporation. Prismatic crystals
in water.

2. (Turner.) By exposing t
the last process to heat. Amor

3. From crude cadmium or
hydrochloric acid, as last.

Cadmium, I'odide of. CdI_2. S
DATE OF CADMIUM; CAD'MII
HYDRIO'DAS, L.

Prep. (Crookes.) Cadmium in
pure iodine 2 parts, are to be pl
in a capacious flask, with alcoho
cover them. Action commence
tended with considerable evolu
when it ceases, heat the mix
colourless; then filter from a
cadmium which will remain un
porate and crystallise.

Uses. In photography this
been employed with great succe
collodion. Being very stable, it
posed, and the collodion iodize
serves its sensitiveness undimi
many months. (See COLLODION
it is used occasionally as a subst
of lead.

Cadmium, Ox'ide of. CdO. *Sy*
OF CADMIUM; CAD'MII OXY'DU
(Hydrated.) From sulphate
cadmium, and a solution of cau
serving to well wash and dry t
A white powder, freely soluble i

2. (Anhydrous.) By ignitin
oxide, or the carbonate or nitra
That from the first two has a pal
that from the nitrate has a d
and a semi-crystalline appearan
has been proposed to be used as

Cadmium, Sul'phate of.
CAD'MII SUL'PHAS, CAD'MIUM
KLAPRO'THRIUM SULPHU'RICU
From carbonate or oxide of cadn
sulphuric acid, as the chloride.

2. (Cottereau.) Oxide of ca
sulphuric acid, q. s.; dissolve,
crystallise.

ulphuric acid, 6¼ parts;
ix; add cadmium, 7 parts;
to dryness, redissolve in
vaporate by a gentle heat,
y form.
orescent, rectangular, pris-
ry soluble in water; tastes
about 4 times as strong as
and is used in similar cases.
Externally (¼ to 3 or 4 grs.
n specks of the eye, opacity
onic ophthalmia, &c. As an
2 grs. to lard, 1 oz.
hide of. CdS. *Syn.* CADMIUM
curs native as GREENOCK'ITE.
ed artificially, either by fusing
ther, or by passing a stream
hydrogen through a solution
nitrate, or sulphate. When
lly, it is of a bright yellow or
and is of great value to the
een used in making fireworks.
ured.
ow. See SULPHIDE OF CAD-
d YELLOW PIGMENTS.

(GUILANDINA) BONDU-
h.) *Habitat.* Tropical portions
pheres.—*Officinal part.* The
llæ Semina, Bonduc seeds); of
regular sub-spherical or ovoid
rom ¼ to ⅝ of an inch in dia-
, hard, and lead-coloured, and
ylaceous white nucleus, having
They contain a fixed oil, resin,
principle.—*Properties.* Tonic
&c.—*Therapeutic uses.* In inter-
; also in debility, and other cases
ca.—*Dose.* 10 to 15 grains twice

POWDER OF BONDUC (*Pulvis
compositus*). Take of bonduc
d of their shells and powdered, 1
epper, powdered, 1 oz. Mix tho-
keep in a well-stoppered bottle.
o 30 grs., three times a day.

[Eng., L.] Cæ. A metal be-
he alkaline group, discovered by
e mineral water of Durckheim by
CTRUM ANALYSIS (which *see*), and
y him from *cæsius*, grayish-blue,
its characteristic ray.

ACID. *Syn.* CHLOROGE'NIC ACID.
der, discovered by Runge in coffee,
exists in combination with potas-
te of potassium), and caffeine, and
soluble in alcohol. Pfaff states
ma of coffee is dependent on the
, or, rather, the decomposition of

E. $C_8H_{10}N_4O_2$. *Syn.* CAFFE'INA,
ARANINE'. A peculiar nitrogen-
, discovered by Robiquet in coffee.
e, the essential principle of tea,
e, and of Guarana, infusions of
d as beverages in *different parts*
The proportion of caffeine to the pound was found by Liebig to be as stated below in the six descriptions of coffee named:—

Martinique	32	grains.
Alexandrian	22	„
Java	22	„
Mocha	20	„
Cayenne	19	„
St. Dominique	16	„

In Hyson tea it exists in the proportion of from 2·5 to 3·4 per cent.; and in gunpowder tea from 2·2 to 4·1. In Paraguay tea, or *maté* as it is called in Brazil, and in Guarana, it exists in the proportion of ·13 per cent.

Prep. 1. Coarsely powdered raw or unroasted coffee, is boiled in water, and subacetate of lead added to the filtered decoction to throw down the extractive and colouring matter; the excess of lead is next precipitated with sulphuretted hydrogen, and the liquid filtered and evaporated by a gentle heat; the residuum is dissolved in boiling water, the solution agitated with freshly burnt animal charcoal, filtered, evaporated, and crystallised. By redissolving the product in hot alcohol, it may be obtained in white, shining, silky filaments, as the solution cools.

2. (H. J. Versman.) Quick-lime, 2 lbs.; water, q. s. to form a hydrate; raw coffee (bruised), 10 lbs.; mix, put it into a displacement apparatus, and cause alcohol of 80% to percolate through the mixture, until the fluid obtained no longer contains caffeine; the mass in the percolator is then roughly ground to powder, mixed with a fresh quantity of quick-lime, and the process of percolation repeated with fresh alcohol, as before. The spirit is next distilled from the mixed tinctures in a retort, and the residuum washed with a little warm water to remove the oil; the evaporation is then gently conducted until a crystalline mass is obtained, which is further freed from adhering oil by pressure between folds of blotting paper. It is purified by redissolving it in boiling water or hot alcohol, &c., as before.

3. (A. Vogel.) An extract of powdered coffee is made with commercial benzol; this being distilled off, leaves an oil and caffeine behind; the oil is then removed by a little ether or by hot water, from which latter liquid the alkaloid crystallises on cooling.

4. From a hot infusion of tea-leaves by treatment with subacetate of lead and sulphuretted hydrogen, as in process 1 (*above*).

Prop., &c. Soluble in 100 parts of cold water; freely soluble in hot water and in water acidulated with an acid; slightly soluble in cold alcohol; it fuses at 352° Fahr., tastes slightly bitter, and possesses feeble basic properties. With the sulphuric and hydrochloric acids it forms crystallisable compounds. The salts of caffeine may be made by dissolving it, *to saturation, in the* dilute acid, and evaporating the solution by a very gentle heat.

It forms splendid double salts with bichloride of platinum and terchloride of gold.

Uses. Caffeine has been recommended in those pains that affect only one side of the head (hemicrania); in doses of 1 to 3 grs. Its physiological action is very trifling, notwithstanding all that has been said to the contrary. Mr. Cooley took 20 grs. daily, of pure caffeine, for above a month, without experiencing any other effect than a very slight elevation of spirits after each dose, similar to that produced by a small quantity of spirits of sal-volatile. It has been used lately with doubtful success as an antidote to the poisonous effects of opium. See Coffee, Tea, &c.

CAFFE'ONE. A brown, aromatic oil, formed during the roasting of coffee.

CAJ'EPUT OIL. See Oils (Volatile).

CAKES. A species of fancy bread or trifle familiar to every one.

Before proceeding to the actual operation of cake-making, the various materials which are to enter into their composition undergo a certain amount of preparation. For this purpose every article is got ready about an hour previously to its being wanted, and is placed before the fire, or upon a stove, that it may become gently heated. Without these precautions it is impossible to produce good cakes. The flour is thoroughly dried, and warmed. The currants are nicely washed in a hair sieve, wiped dry in a cloth, and then set before the fire. Before use, they are dusted over with a little flour. The sugar is rubbed to a fine powder, and passed through a sieve. The eggs are well beaten in a basin, and strained. The butter is melted by being placed in a basin set in hot water, and is afterwards well beaten up with a little warm milk. The lemon peel is cut very thin, and beaten in a mortar to a paste or powder, with lump sugar; or for common purposes, it is grated. The caraways, ginger, and other flavouring ingredients, are preferred in the form of fine powder, or are made into an essence, by digesting them in spirit of wine; the first is the most common method. The milk and water is made lukewarm. When all these things are ready and have stood a sufficient time, they are put into a pan, one after another, in the proper order, and well beaten together, by which the lightness of the cakes is considerably increased.

In plum cakes, as well as in some other varieties, a little yeast may be added after the butter, and the mass allowed to rise a little, and then again well kneaded, by which not only less butter and eggs may be used, but the products will be both lighter and more wholesome. Good stale bread, well soaked in hot milk or water, and then beaten to a paste, and passed through a fine sieve, forms an excellent thing to mix up the ingredients with, and produces a very light and nutritious cake. Cakes "wetted up" with milk are richer, but do not keep so well as those without it; they get stale sooner, and
when in that state are far fro
the palate. A kind of flour
maize or Indian corn has been
duced to the notice of cooks, b
adapted for puddings than fo
Corn-flour.

Cakes are preferably baked on
little "tin shapes," which shoul
buttered.

Cakes should be kept for
canisters; wooden boxes, unl
seasoned, are apt to give them
taste. Brown-paper linings
should be avoided for the same
Biscuits, Bread, Bun, Icing,

Cakes, Al'mond. *Prep.* 1. F
monds (blanched and beaten
paste), flour and powdered sugar,
7 eggs, and the outside peel
(shredded small). The almonds,
peel, and eggs, are beaten toge
white as sponge paste; the flour
in, and the paste put into but
and baked in a slack oven, with
nesses of white paper under the
two over them.

2. Almonds, 1 lb.; sugar, ¾ lb.
or orange-flower water, ¼ pint;
3 eggs; as above. Some pers
cakes.

Cakes, Ban'bury. *Prep.* Fro
dough fermented for white bread,
as in making puff paste, then r
thin, and cut it into oval or tria
or other shapes. On these are
ture of currants and moist sugar
wetted with a little wine or bra
paste being closed up, they are
tin with the closed side downwar
A little powdered sugar, flavour
died peel (grated), or essence of l
over them as soon as they com
oven. In the common cakes
the brandy is omitted, and lar
butter, and less of it.

Cakes, Bath. *Prep.* From butt
1 lb., 5 eggs, and a cupful of yeas
add powdered sugar, 4 oz., and c
Bake them on tins.

Cakes, Cheese. *Prep.* 1. Curdl
new milk with rennet, drain t
linen bag, and add ¼ of its wei
sugar and butter, 6 eggs, some g
and a little-orange flower or rose

2. (*Almond Cheese Cakes.*)
add as much blanched almonds,
smooth paste, as there is butter,
weight of macaroni.

3. (*Lemon Cheese Cakes.*) To
add lemon peel (grated fine),
lemon, q. s.

Cakes, Di'et. *Syn.* Diet bre
Dissolve sugar, 1 lb., in milk,
eggs, and whisk the mixture to
then cautiously stir in flour, 1 l
¾ hour, and immediately bake

e baked whole or divided into

flour and powdered sugar,
ggs; and the juice and rind
on.

Prep. Eggs, 1 dozen; rose-
onful; powdered sugar, ½ lb.;
and caraways, ½ oz. Drop it
nd bake as before.

Prep. Sugar, 1 lb.; powdered
lour, 2 lbs.; water, 1 pint;
andied orange peel, 8 caps

Prep. Flour and sugar, of
, 1 dozen; grated peel and
; whisk the eggs to a bright
ally add the rest.

rough. Prep. Beat 8 eggs and
sugar ¾ hour; then add fine
caraway seeds, 2 oz.

Prep. 1. From flour, 4 lbs.;
butter, ½ lbs.; caraway seeds,
lemon peel (grated), 1 oz.;
milk, q. s. Let it rise well

ugh, 2 lbs.; currants, 1 lb.;
eggs; milk (hot), ¼ pint.

Baker's dough, 4 lbs.; butter
, of each, ¼ lb.; caraway seeds,
Well work it together, pull
e size of a golden pippin, and
r again. This must be done
t will be in lumps, and heavy

qual weights of flour, butter,
eggs, currants, and brown
with milk, and seasoned with
tmeg, &c., and baked in a quick
mbles "pound cake."

Prep. 1. (*Good.*) From but-
our, 3 lbs.; Lisbon sugar, 8 oz.;
ants, of each, ¾ lb.; and some
powdered; to be "wetted up"
s of yeast, and a Winchester
k (warmed); bake on a floured
r.

) From fresh butter, sifted
d currants, of each, 1 lb.; 18
spices, 2 oz. (viz., cloves, mace,
and allspice); sliced almonds

10 eggs; currants, ½ lb.; and a little white wine; bake in small tins only half filled.

Cakes, Pound. *Prep.* 1. As plum cake; but using 1 lb. each of all the ingredients, except the spices.

2. Using equal parts of sugar, flour, currants, and sultana raisins, and half that quantity each of butter, brandy, and candied peel, with spices as required.

Cakes, Queen. *Prep.* From about 1 lb. each of dried flour, sifted sugar, washed currants, and butter, with 8 eggs; the whole beaten for an hour, made into a batter, and baked in little tins, teacups, or saucers, only half filled. A little fine sugar is frequently sifted over them. Nutmeg, mace, and cinnamon are also sometimes added.

Cakes, Rat'ifia. *Prep.* Beat ½ lb. of sweet, and 1 oz. of bitter almonds, in fine orange, rose, or ratifia water; mix in ½ lb. of pounded sugar; add the whites of 4 eggs (well beaten); set it over a moderate fire in a preserving-pan; stir it one way until it is pretty hot, and when a little cool, form it into small rolls, and cut it into thin cakes; shake some flour lightly on them, give each a light tap, put them on sugar papers, sift a little sugar on them, and put them into a very slack oven.

Cakes, Rout. *Prep.* From flour, 2 lbs.; butter, sugar, and currants, of each, 1 lb.; 3 eggs; ½ pint of milk; 2 glasses of white wine; and 1 glass of brandy; drop them on a tin plate, and bake them.

Cakes, Savoy. *Prep.* From flour and sifted sugar, of each, 1 lb.; 10 eggs; and the rind of a lemon (grated); form a batter by degrees, put it into moulds, and bake in a slack oven.

Cake, Seed. *Prep.* 1. (*Plain.*) From flour, ¼ peck; sugar, ½ lb.; allspice, ¼ oz.; melted butter, ½ lb.; a little ginger; milk, ½ pint; yeast, ¼ pint; add seeds or currants; and bake an hour and a half.

2. (*Good.*) To the preceding add of butter and sugar, of each, ½ lb., and wet it up with milk previously mixed with 6 eggs.

3. (*Rich.*) Take of flour, 1½ lb.; butter and sugar, of each, 1 lb.; 8 eggs; 2 oz. of caraway seeds, 1 grated nutmeg, and its weight in cinnamon. Bake 2 hours in a quick oven.

4. (*Scotch.*) Nine eggs; sugar and butter,

2 oz.; candied peel, ½ oz.; sesquicarbonate of soda, 3 drs.; milk, q. s.

Obs. An equal weight of carbonate of magnesia, used instead of the soda, also makes good cakes. Both are suitable to delicate stomachs, especially in dyspepsia, with acidity.

Cakes, Sponge. *Prep.* From 8 eggs; lump sugar, ¾ lb.; flour, ½ lb.; water, ½ pint; the yellow peel of a lemon; mix as follows:—Put the lemon peel into the water; when about to make the cake, put the sugar into a saucepan, pour the water and peel on it, and let it stand by the fire to get hot. Break the eggs into a deep earthen vessel that has been made quite hot; remove from the heat, whisk for a few minutes; make the sugar and water boil up, and pour it very gradually boiling-hot over the eggs; continue to whisk them briskly until they become thick and white; add the flour (quite warm), stir it lightly in, put the paste into tins lined with white paper, and bake them immediately in a moderately hot oven.

Cakes, Tea. *Syn.* BENTON CAKES. *Prep.* From flour, 1 lb.; butter, 4 oz.; and milk, q. s.; bake on a hot hearth or slow oven plate.

2. To the last, add 2 table-spoonfuls of yeast.

Cakes, Tip'sy. *Prep.* Small sponge cakes steeped in brandy, and then covered with grated almonds and candied peel; or almonds (cut into spikes) are stuck in them. They are commonly piled on a dish, surrounded with a custard, and covered with preserves drained as dry as possible.

Cakes, Wigg. *Prep.* From ½ pint of warm milk; ¾ lb. of fine flour; and 2 or 3 spoonfuls of light yeast. Afterwards work in 4 oz. each of sugar and butter; make it into cakes, or wiggs, with as little flour as possible, add a few caraway seeds, and bake them quickly.

Cakes. (In *medicine.*) Cakes have been used as a form of administering medicinal substances to children, but have not been extensively employed in this country for the purpose, unless by quacks, and in domestic practice. In preparing them, the active ingredients are added in such proportions to the common materials of a sweet cake, that one or two, as the case may be, are sufficient for a dose. See GINGERBREAD, WORM-CAKES, &c.

CAL'AMINE. See ZINC (Carbonate of).

CALCINA'TION. The operation of burning or roasting any solid body to expel its more volatile parts, as the conversion of chalk into lime by the expulsion of carbonic anhydride. The roasting of the ores in the first stage of the Welsh process of copper smelting and in the Silesian mode of extracting zinc is technically termed CALCINATION.

The method of conducting the process of calcination depends on the nature of the body operated on. Many substances, for delicate experiments, are calcined over a spirit lamp in a platinum spoon or crucible; others, in iron vessels or earthen crucibles, placed in a common furnace. When the action of
proves injurious, as in the manuf
charcoal, the process is performed
vessels or chambers. In some cases
is mixed with the articles, and they
burnt together, as in the manufactur
the roasting of ores, &c. The process
ing salts, or driving off their water
tallisation by heat, is also frequen
CALCINATION; thus we have calcined
alum, &c.

CALCI''NER. . A reverberatory fur
for the calcination of metallic ores, par
those of COPPER and ZINC (which see).

CAL'CIUM. [Eng., L.] Ca. The
which LIME is an oxide. Though it
mical curiosity when isolated, it is
most abundant substances in nature,
very large portion of the crust of
It occurs in combination with
fluor-spar; with oxygen and carb
as chalk, limestone, and marble;
oxygen and sulphuric acid as gyp
metal was first obtained from lime by
Davy, in 1808; but little was kno
properties until Dr. Matthiessen fo
the electrolytic decomposition of the
of calcium.

Prep. 1. By the action of a power
current upon a paste of pure lime in
with mercury, as in the original
preparing barium.

2. By the electrolysis of chloride of
in a state of fusion.

3. (Caron.) Fused chloride of cal
powder, 300 parts; distilled zinc, fine
lated, 400 parts; sodium, in small pie
parts; the whole placed in a cruci
heated to redness in an ordinary furna
action is very feeble at first, but aft
time zinc flames arise. The heat mu
be moderated, to prevent the volatilis
the zinc, but at the same time it
maintained as high as possible. W
crucible has remained in this state fo
quarter of an hour it may be withdra
cooling, a metallic button will be fou
bottom. This alloy of zinc and calciu
generally contains from 10 to 15% of
metal, must be placed in a coke cru
heated until the whole of the zinc
off. The alloy should be in pieces as
possible. When proper precautions
observed, a button of CALCIUM is
only contaminated with the foreig
contained in the zinc.

Prop., &c. The metal belongs to t
which includes BARIUM, STRONTIUM,
NESIUM; it is of a light yellow co
rather harder than lead, and very
It melts at a red heat. It tarnishes
or two, even in dry air, and in con
moist air it breaks up like ordinary li
sp. gr. is 1·55.

Tests. Salts of calcium in solut
duce a white precipitate with car

becomes far less voluminous on
ation, and dissolves very readily
: acid. Sulphuric acid, when
ntrated solutions, gives an im-
precipitate; if the solution is
d, the precipitate may separate
inute crystals; and if it is very
pitation will take place, because
e is soluble in about 500 times
vater. With neutral solutions,
y dilute, oxalate of ammonium
s white precipitate, soluble in
ds.

'mide of. $CaBr_2$. *Syn.* Cal'cii
. *Prep.* (Magendie.) To a so-
dide of iron add hydrate of cal-
excess; filter, evaporate to dry-
s in water, and again filter, and

lo''ride of. $CaCl_2$. *Syn.* Cal'cii
B. P.). *Prep.* Hydrochloric acid
f each, 10 fl. oz.; chalk, 5 oz.;
solution until the salt becomes
the residue at about 400° F.
sed in solution as a residuum in
ral preparations of ammonia, as
d carbonate, and in making car-
the action of hydrochloric acid
The residuum is concentrated and
ystallise, or evaporated to dryness.
s, &c. This salt crystallises in
triated, hexagonal prisms, termi-
y acute points. It is very soluble
nd water, the latter even at 32°
nore than its own weight, and at
four times its weight of this salt.
d, the crystals undergo watery
en dissolved in water, they pro-
cold; and hence are frequently
s an ingredient in freezing mix-
hese crystals contain nearly half
t of water. They are very deli-
sing readily into the liquid state,
g what used to be called oleum
l of lime. The anhydrous chloride
d friable; slightly translucent;
readily soluble in water, and, like
lised salt, very deliquescent. In
ry chloride of calcium, either fused
ried, is continually used for drying
for absorbing the water from ethe-
y liquids in organic analysis. The
now generally preferred for this
it is more porous than the fused.
also used in the rectification of
l to form a bath for heating stone-
and other apparatus liable to be

Moor and Derbyshire, and in the concretionary crystalline masses known as Blue John or Derbyshire spar at Castleton. It may be prepared by the action of hydrofluoric acid upon lime, as directed under Fluoride of Barium.

Calcium, I'odide of. CaI_2 *Syn.* Hydri'odate of lime; Cal'cii iodi'dum, Calcis hydrio'das, L. *Prep.* 1. (Magendie.) From a solution of protiodide of iron and hydrate of calcium, as directed under iodide of barium.

2. Dissolve lime or carbonate of lime in hydriodic acid.

Prop., Uses, &c. It is a deliquescent salt, easily soluble in water, and has a bitterish taste. It has been used in scrofulous affections, internally, in doses ranging from ½ to 2 grs., thrice daily, and externally in ointments containing 2 drs. or less to the oz.

Calcium, Ox'ide of. See Lime.

Calcium, Phos'phide of. *Syn.* Phosphu'ret of lime; Cal'cii phosphure'tum, C. phosphi'dum, L. *Prep.* By passing the vapour of phosphorus over lime (in small fragments) heated to redness in a porcelain tube. A brownish substance, supposed to be a mere mechanical mixture of phosphide and phosphate of calcium. Thrown into water, it suffers instant decomposition, and phosphuretted hydrogen gas escapes.

Calcium, Sulphides of. Calcium forms with sulphur at least three different compounds:—

1. **Calcium, Protosul'phide of.** CaS. *Prep.* —*a.* From sulphate of lime, exposed at a high temperature to a stream of hydrogen gas.—*b.* From dried gypsum, 25 parts; lampblack or finely powdered charcoal, 4 parts; calcined together at a strong heat in a covered crucible.

2. **Calcium, Bisulphide of.** CaS_2. *Prep.* From sulphur and quick-lime, equal parts; water, q. s.; slake the lime, add the sulphur, and boil until a solution is obtained, which on cooling deposits crystals.

3. **Calcium, Pentasulphide of.** CaS_5. *Prep.* As the last, but increasing the quantity of sulphur, and continuing the boiling for a longer period. Little is known about it.

4. **Calcium, Commercial Sulphuret of.** *Syn.* Commercial sulphide of calcium. *Prep.* —*a.* As 1, *b* (*above*).

b. Sulphur, 1 part; hydrate of lime, 3 parts; water, 2½ pints; boil it until it solidifies on cooling, then pour it out on a cold marble slab, and when solid break it into pieces and preserve it in a well-corked bottle.

c. (Guibourt.) Quick-lime, 7 parts; sulphur, 4 parts; mix, and heat the compound for about

about ¼ of an hour. Made into an embrocation, it has been strongly recommended in gout, scabies, &c. Its solution yields pure sulphur on the addition of hydrochloric acid.

CALCULA'TIONS (Useful). 1. *To find the Value of a Dozen Articles.* Take the price in pence as shillings, and if there are any farthings in the price, add threepence for each. Thus 2*s.* 8*d.*, or 32 pence per yard, is £1 12*s.* per dozen.

2. *To find the Value of One Hundred Articles.* For every farthing take as many pence and twice as many shillings. Thus, 1¼*d.* each, is—5*d.*, and 10*s.* = 10*s.* 5*d.* per hundred.

3. *To find the Value of a Pound at any price per Ounce.* Take the price in farthings as shillings, and divide by three. Thus, 5¼*d.* per ounce, is 21 farthings; taken as shillings, 21 ÷ 3 = 7*s.* per pound.

4. *To find the Value of an Ounce at any price per Pound.* Take the shillings as farthings, and multiply by three. Thus, at 6*s.*—6 × 3 = 18 farthings, or 4½*d.* per ounce.

Obs. By reversing Nos. 1 and 2, the price of a single article or pound may be fonnd from the price per dozen or hundred. For several other calculations, useful in domestic economy, chemistry, &c., see Brewing, Decimals, Equivalents, Measures, Per-centage, Weights.

CAL'CULUS. *Syn.* Stone. In *medicine*, a hard concretion formed within the animal body by the deposition of matters which usually remain in solution. The concretions most commonly formed are those formed in the kidneys or bladder, and termed *urinary calculi*, and those formed in the gall-bladder or biliary ducts, which are called *biliary calculi.* Both of these give rise to very painful symptoms, and may even threaten life.

CAL'ENDAR. *Syn.* Calenda'rium, L.; Calen'drier, Fr. A table of all the days of the year, arranged in the order of days and weeks, to which are generally added certain astronomical indications and dates of great civil and religious events. The most remarkable calendars are the *Hebrew calendar*, the *calendar of the Greeks*, the *Roman*, or *Julian calendar*, the *Gregorian calendar* (now adopted by all Christian peoples except the Greeks and Russians), and the *French Republican calendar*, which, having remained in force about thirteen years, was abolished by Napoleon I on the 1st of January, 1806.

Calendar, Perpet'ual. A table which furnishes the general indications necessary to construct a calendar for any year, and to resolve, without error, many difficulties connected with the verification of dates.

CAL'ENDERING. The process of finishing by pressure the surface of linen or cotton goods. It is usually performed by passing the fabric between cylinders pressed together with great force. It is necessary that one of the cylinders, at least, shall be of a material combining considerable hardness with a slight degree of elasticity; for this purp
cylinder is used. It is made by
pressing a number of circular
pasteboard, each with a square
centre, upon an iron axis, so as
cylinder, which is turned perfect
true in a lathe. The paper cy
works against a hollow roller
iron, heated by steam or me
Before the final rolling in the
machine the fabric is lightly
passing over warm cylinders.
are starched, and a fictitious
stoutness is sometimes given to
ploying starch thickened with pl
porcelain clay, or a mixture of t
ing is a beautiful effect produced
a hot cylinder with a pattern r
Glazing is produced by combined
pressure, the rollers being made
unequal velocities, so that one side
is rubbed as well as pressed by th
surface moves with the greater s
per cylinder is preferred for g
made so hot that if the machine
the goods. The old method of gla
in burnishing the surface of the
polished flint.

CAL'ICO. See Cotton.

CAL'ICO PRINT'ING. The art
figured patterns upon calico, by
and mordants topically applied
blocks, copper-plates, or engrav
The goods are either directly prin
or receive their patterns by being
a colouring matter or mordant,
is only produced upon that po
ground previously prepared for
this system of dyeing has been
silks and woollens.

The mordants are thickened
glutinous substance, as flour, sta
to render them adhesive and to
spreading.

The following are the princi
calico-printing, each requiring
method of manipulation :—

In the *madder, fast colour,* or
the mordants are applied to the
and the colours are brought ou
bath. This is the method comm
for "permanent prints."

In the *padding* or *plaquage st*
cloth is passed through a bath of so
mordant, and different mordants a
printed on it before submitting
bath. By this means the colour o
and pattern is varied. Like th
much used for gown pieces, &c.

In the *reserve* or *resist-paste s*
coloured figures are produced,
those parts with a composition
the general dye afterwards applie
ground of the pattern. In this
bath is indigo, or some other
colour.

ye, or *rongeant style*, is the re-
preceding; it exhibits bright
rk ground, which are produced
th acidulous or discharge mor-
e cloth has been passed through
bath.

r *printing*, consists in printing
a mixture of dye extracts and
l afterwards exposing it to the
m.

r *printing*, is a method by which
rs are produced by a mixture of
nd solution of tin, called by the
s of tin."

inting, consists in applying such
tramarine, magenta, or aniline
e cloth, and fixing them by such
ein, albumen, or solution of India
s style of printing has been de-
great extent since the introduc-
splendid mauves and purples
n aniline.

r information on this subject, the
rred to Ure's 'Dictionary of Arts,
s, and Mines,' and O'Neill's 'Dic-
alico Printing and Dyeing,' where
l the several processes of calico
ly treated on, and most ably and
described. To enter largely into
in this work might amuse the
would be of no practical value;
inting is an art only practised on
ale, and by men who obtain their
ledge of it in the laboratories and
ms of the factories.

L. See MERCURY (Chlorides of).

OPIS PROCE'RA. }
OPIS GIGAN'TEA. } (Ind.Ph.) *Syn.*
Habitat. One or other of these
rywhere in India.—*Officinal part.*
ark, dried (*Calotropis cortex*). Small
ched pieces, brownish externally,
yish internally, peculiar smell, and
ous, nauseous, acrid taste. Its ac-
ears to reside in a peculiar extractive
med *mudarine*.—*Properties.* Altera-
; diaphoretic, and, in large doses,
Therapeutic uses. In leprosy, consti-
yphilis, mercurial cachexia, syphilitic
thic ulcerations, in dysentery, diar-
l chronic rheumatism, it has been
alleged benefit.

f Mudar. (*Pulvis Calotropis.*)
he roots of mudar, collected in the
April and May from sandy soils, a
; carefully remove, by washing, all
sand and dirt, and dry in the open
it exposure to the sun, until the
contained in it becomes so far in-
hat it ceases to flow on incisions
in it. The bark is then to be care-
red, dried and reduced to powder.
well-corked bottles.—*Dose.* As an
mic, 3 grains, gradually increased
s or more, thrice daily. *As an*
½ to 1 drachm.

CAL'OTYPE. See PHOTOGRAPHY.

CALUM'BA. *Syn.* CALUMBÆ RADIX, B. P. CALUM'BA-ROOT; KALUMB, Hind. The root of a plant of Eastern Africa, extensively used in *medicine* as a stomachic and mild tonic. *Dose.* 10 to 20 grains, three or four times a day. The botanical name of this plant is *Jateorhiza palmata*, or *Cocculus palmatus.* See CALUMBINE (*below*); also INFUSIONS and TINCTURES.

CALUM'BA WOOD. This wood, which is used as a tonic by the Cingalese, is not the produce of the true calumba plant, but of *Menispermum fenestratum.* It contains the alkaloid BERBERINE (which *see*).

CALUM'BINE. *Syn.* CALOM'BINE, CALUM'-BINA. A bitter substance discovered by Wittstock in calumba root.

Prep. 1. Digest calumba root (in coarse powder) in water acidulated with acetic acid; express, filter, boil to one half, again filter, add carbonate of calcium, in slight excess, and evaporate to dryness in a water bath; reduce the residuum to powder, and digest it in boiling alcohol; the latter will deposit crystals of CALUMBINE on cooling.

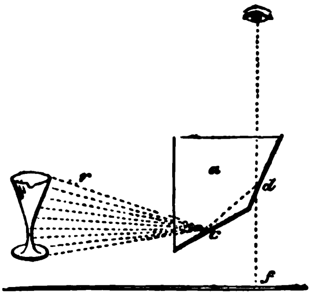
2. (Wittstock.) Evaporate tincture of calumba root (made with rectified spirit) to dryness; dissolve the residuum in water, and agitate the solution with an equal bulk of ether; after repose for a short time, decant the ethereal portion, distil off most of the ether, and set the liquid aside to crystallise.

Prop., &c. Impure calumbine occurs as a yellow-brown mass; when pure, it forms rhombic prismatic crystals or delicate white needles; it is only slightly soluble in alcohol, ether, and water; 40 parts of boiling rectified spirit take up only 1 part of calumbine. Its best solvent is acetic acid; it is also soluble in acidulated and alkalised water. Neither nutgalls nor metallic salts affect its solution. Concentrated sulphuric acid dissolves it, and assumes first a yellow, and then a red colour. Its properties indicate that weak vinegar or sour wine would be the best menstruum for extracting the medicinal virtues of calumba root. *Dose.* 1 to 3 grs. twice a day as a tonic and stomachic, in dyspepsia, debilitated stomach, bilious vomiting, &c.; and in the later periods of dysentery and diarrhœa.

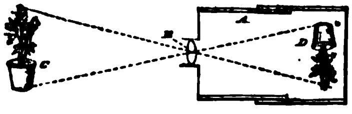
CALX. This term was formerly applied to the residuum of the combustion of any substance; or to any substance which had been exposed to a strong heat. See CALCINATION, LIME, &c.

CAMBOGE'. See GAMBOGE.

CAM'ERA LU'CIDA. [L. and Eng.] When a ray of light (*r*) falls upon a quadrangular glass prism (*a*), it is bent by two reflections (at *c* and *d*), and thrown upwards where it may be received by the eye, to which it will appear described on the table or sheet of paper (*f*), placed to receive it. The point of a pencil *used to trace any object* on the paper can also *be seen, and by its* means the picture can be easily copied. When the prism is mounted on a stand, and a thin brass plate with a small hole through it for the eyepiece adjusted thereto, it forms the CAMERA LUCIDA of the opticians. The image may be magnified or lessened by placing a lens, so as either to intercept the rays before they strike the prism, or before they reach the eye. An ingenious person will readily be able to set up this instrument, than which a more useful one cannot exist.



CAM'ERA OBSCU''RA. [L. and Eng.] An optical instrument for producing upon a screen the image of a field of view more or less extensive. It was invented by Baptista Porta in the 16th century. The principles and construction of the camera obscura may be thus described:—A convex lens (*B*), is placed in a hole admitting the light into a darkened box or chamber (*A*), which, falling on a white ground (*D*), produces an inverted picture of every object within its range. The image thus formed may be restored to its natural position, by allowing the rays of light to pass through two lenses instead of one, or by receiving the rays on a mirror placed at an angle of 45°, when the image will be thrown on the floor in its original position. The picture may be viewed through an oblong aperture cut in the box, or the experiment may be performed in a darkened room, by placing the lens in a hole in the shutter, and allowing the image to fall on the wall, or on a sheet of white paper stretched to receive it.



In the simplest form, when intended for taking views or portraits, the image is thrown upon a mirror placed at an angle of 45°, and resting on the bottom of the box, by which means it is thrown upwards against a plate of glass, also placed at a similar angle. On this is laid a piece of semi-transparent tracing paper, on which the object is distinctly seen painted, and may be traced out with a pencil. When
the camera is used in photogr
provided to retain the sensitiv
proper position in the box or
to receive the image, and the w
is adjusted with screws, and sli
delicate description. Achroma
also employed. See PHOTOGRA

CAM'PHINE. The name
trade to rectified oil of turpen
for burning in lamps, in order t
may not be aware of the inflam
of the liquid. Since the intro
hydro-carbon oils from coal, sh
leum, camphine has been little
ing. To rectify the turpentine,
vapour through a solution of
soda, or lime; or through sulph

CAM'PHOR. $C_{10}H_{16}O$. *Syn*
LAU'REL CAM'PHOR; CAMPHO
crystalline substance found in
though only obtained in large
two, namely, *Camphora officina*
balanops aromatica. The fi
known as the laurel camphor tre
Japan, yields the camphor of
latter, the Sumatra or Borneo
the peculiar fluid known as liqu

It is found that several of th
by carefully distilling off about
volume, yield a species of cam
lecting this, and redistilling th
the oil 2 or 3 times, a further q
phor may be obtained. Oil
treated in this way, yields abou
phor; oil of sweet marjoram th
sage yields 13⅛; oil of laven
keeping the oils loosely corked,
place, they produce a larger
camphor. Aniseed camphor is
portion of oil of aniseed, sepa
liquid oil, which it resembles
flavour.

Camphor, Am'ber. See PYR
lised).

Camphor, Com'mercial (Crude
of the laurel camphor tree, bro
chiefly from China and the isla
in the form of grayish grains, a
crumbling cakes.—*Prep.* Th
Japanese extract the camphor
wood into small pieces, and
water in iron vessels, which a
large earthen capitals or don
rice straw. As the water boil
is volatilised along with the s
denses on the straw.

Camphor, Commercial (R
WHITE CAMPHOR; CAMPHO'R
100 parts of crude camphor a
parts each of quick-lime and s
both in powder, and the mixtu
thin, globular, glass vessel, s
bath. The heat is then cau
and the vessel gradually and
out of the sand as the su
on. When the process is

. is removed and allowed to

le process of refining camphor are and experience to ensure conducted too slowly, or at a Fahr., the product is found consequently unsaleable, with- subliming. An improvement method, is simply to sublime ure in any convenient vessel large and well-cooled receiver, e product in close vessels under cool the liquid mass as rapidly

A white, semi-crystalline solid, common temperatures; freely ol, ether, bisulphuret of carbon, d acetic acid, and sufficiently out 1¼ gr. to 1 oz.), to impart ic smell and taste; 100 parts gr. ·806) dissolve 120 parts of centrated acetic acid dissolves ht of camphor; average sp. gr. at 347°, boils at 400° Fahr., fire to, burns with a bright porates slowly at ordinary tem- crystallises on the inside of e floating on water it undergoes tory movement.

Camphor is sedative, narcotic, oretic, and anaphrodisiac. *Dose.* in the form of pill or bolus, or emulsion with yolk of egg, mu- ods. In overdoses it is poison- t antidote is opium or wine, pre- metic. It is also used externally liniments, and embrocations.

frequently put into wardrobes runks, to keep away insects; it ake the white stars and fire of nist; and by the varnish-maker the solubility of copal and other ed with six times its weight of istilled, it suffers decomposition, yellow, aromatic, volatile oil, smell- of thyme and rosemary, which is y the wholesale druggists and per- lterate some of the more costly , and by the fancy soap-makers to oaps.

may be beaten in a mortar for ithout being reduced to powder, first broken with the pestle, and ed with a few drops of rectified ne, it may be readily pulverised. ater to an alcoholic or ethereal amphor, this drug is precipitated rm of an impalpable powder of teness.

re camphor is entirely soluble irit, oils, and strong acetic acid; laced on a heated spoon or in a n, will wholly disappear, and the will be highly fragrant (cam- and be free *from an acid or tere-* ine. *In an alcoholic solution of* natural camphor, ammonia gives but a slight precipitate, which is dissolved on shaking the mixture; a similar solution of artificial camphor under the like treatment gives a flocculent precipitate, which remains undissolved. See FACTITIOUS CAMPHOR (*below*).

Camphor, Facti''tious. *Syn.* HYDROCHLORATE OF TUR'PENTINE, HYDROCHLORATE OF CAMPHENE, ARTIFICIAL CAMPHOR. Prepared by passing dry hydrochloric acid gas into pure oil of turpentine, cooled by a freezing mixture or pounded ice. After a time a white, crystalline mass is formed, which must be drained, and dried by pressure between folds of bibulous paper. It may be purified by solution in alcohol.

Prop., &c. It has a camphoraceous taste and odour; burns with a greenish, sooty flame, and when blown out evolves a terebinthinate odour; heated a little above the boiling-point of water, slight fumes of hydrochloric acid gas are perceptible. See CAMPHENE.

Camphor, Hydrochlo''rate of. *Syn.* MU''RIATE OF CAMPHOR; CAMPHO'RÆ HYDROCHLO''RAS, L. By passing hydrochloric acid gas over camphor, in small fragments, until it ceases to be absorbed.

Camphor, Liq'uid. *Syn.* CAMPHOR OIL; O'LEUM CAMPHO'RÆ, L. A pale yellowish, limpid fluid, which exudes from *Dryobalanops aromatica*, a tree growing in Sumatra and Borneo, when deep incisions are made in the trunk. It is supposed that the crystalline SUMATRA CAMPHOR (see *below*) is deposited from this fluid. The liquid camphor has somewhat the odour of CAJEPUT OIL, and might, no doubt, be beneficially employed for the same purpose. It is sometimes imported into Europe.

Camphor, Ni'trate of. *Syn.* CAMPHOR OIL; O'LEUM CAMPHO'RÆ FACTI''TIUM, L. Prepared by dissolving camphor in nitric acid, in the cold.

Camphor, Sul'phite of. From camphor and sulphurous acid gas, as hydrochlorate of camphor.

Camphor, Suma'tra. *Syn.* BOR'NEO CAMPHOR, HARD C., DRAGON'S BRAIN PERFUME. Obtained from *Dryobalanops aromatica*, being found in natural fissures or crevices of the wood. It resembles ordinary camphor in most properties, but its odour is not of so diffusible a nature. This kind is not seen in European commerce.

CAMPHOR CAKES. See BALLS (Camphor).

CAMPHOR'IC ACID. $H_2C_{10}H_{14}O_4$. *Syn.* ACIDUM CAMPHOR'ICUM, L. *Prep.* From camphor, 1 part; and nitric acid (sp. gr. 1·33), 4 parts; distilled together in a glass retort, with a gradually increasing heat, until vapours cease to be evolved; the camphor that has volatilised is then added to that in the retort, along with 4 or 5 parts more of nitric acid, and the process repeated again and again, until 20 parts of acid have been consumed, *when crude camphoric* acid crystallises out of *the remaining* liquor, on cooling. The crystals are purified by washing with cold distilled water, solution in boiling water, and evaporating the solution until a pellicle forms; crystals of pure camphoric acid are formed as the liquid cools.

Prop., *&c.* Small, colourless, lamellar or acicular crystals; acid; bitter; fusible at 158° Fahr.; sparingly soluble in water; soluble in alcohol; alcoholic solution not precipitated by water, which distinguishes camphoric acid from benzoic acid. Its salts are called CAMPHORATES. The soluble camphorates may be made by digesting the carbonate or hydrate of the metal in a hot solution of the acid, and the insoluble camphorates by double decomposition. By distillation, camphoric acid yields a colourless, crystalline, neutral substance, which has been improperly called anhydrous camphoric acid.

CAM'WOOD. This dye-stuff resembles Brazil wood in its properties, and is used in a similar manner.

CAN'ADA BALSAM. *Syn.* BAL'SAMUM CANADEN'SE, TEREBINTH'INA CANADEN'SIS, L. A thick, viscid oleo-resin obtained from the *Abies balsamea* (Lindley), a tree of common growth in Canada and the State of Maine. It is much employed as a medium for mounting microscopic objects. When pure, it is perfectly transparent, has an agreeable odour (not terebinthinate), and is wholly soluble in rectified oil of turpentine, with which it forms a beautiful glassy and colourless varnish, much used for preparing a semi-transparent copying paper.

Canada Balsam, Facti"tious. *Syn.* BALSAMUM CANADENSE FACTI"TIUM, L. *Prep.* 1. Yellow resin, 3 lbs.; oil of turpentine, 1 gal.; dissolve, and add essence of lemon, 2 drs.; oil of rosemary, 1¼ dr.

2. To the last add of nut oil, 1 pint. Both are sold in the shops for Canada balsam.

CAN'DIES. See CANDYING.

CAN'DLES. Candle-making, once a rude and noisome trade, is now a first-class chemical manufacture, and as it is generally carried on in large works under the superintendence of men trained in the laboratory, a detailed account of the numerous processes included in it would be out of place here. We will, however, briefly describe the principal kinds of candles now in use, and give a few particulars respecting their manufacture. Candles are either dipped, moulded, or rolled. The cheaper sorts of tallow candles are formed by the first process, and wax candles by the last; all the other kinds are moulded. The moulds are tubes of pewter, well polished on the inside, eight or more being fitted into a frame, the upper part of which forms a trough to receive

bar placed across the top. At the
Price's Patent Candle Company th
moulds are ranged close togeth
benches, and are filled with hot ca
rial from cars running along littl
above them. When quite cold the
withdrawn. The plan of pulling
one by one with the aid of a bodki
superseded at the factories above
by the ingenious device of blowin
with compressed air.

The wicks of ordinary tallow
made of the rovings of Turkey
4 or more of which, according to t
thickness of the wick, are wound
from which they are again run
into the proper lengths. Of lat
wicks of the best candles have
in such a way that they do not req
ing. This object is effected by
wick to bend over, and its end to
the flame, where it is exposed to th
the air. This bending over is variou
about.—1. By twisting the wick
strand shorter than the rest, wh
slightly stretched during the mould
candle, contracts again and bend
when the fat melts. 2. By plaiting
into a flat wick, which naturally ta
quired curve. Such a wick is gener
in a solution of borax, which preser
being acted upon by the flame ex
extreme point at the edge of the
very fine wire is sometimes inclu
plaited wick. 3. In Palmer's p
wicked candles, which were form
used in lamps, the wicks are satu
subnitrate of bismuth ground up
they are then twisted tightly rou
which is withdrawn after the candle
In burning, the ends gradually u
stand out of the flame on either s
devices are said to be employed.

Candles, Com'posite. Mould can
of a mixture of the hard fatty ac
from palm oil and the stearine of c
They were introduced in 1840.
positions are occasionally used, su
ture of spermaceti and hard whit
which a little bleached resin is add

Candles, Med'icated. These hav
posed as a convenient means of d
active principles of certain volatil
through the atmosphere, and for c
partial fumigations. They are
ployed in England.

Candles, Mercu"rial. From the
or the gray oxide of mercury mixe
and a wick of cotton inserted t
commended by Mr. Colles for pa

free from odour and greasi- produced by 98 lbs. of paraffin o that of 120 lbs. of spermaceti, rax, or 144 lbs. of stearic, or st composite candles (Letheby). mes delicately tinted with red, rimson, and rose colour. The dles of Price's Patent Candle med of the paraffin of Rangoon

rmace'ti. From spermaceti These are very delicate in rather expensive. They burn melting-point of spermaceti is ., they will not bear carrying and without guttering. They dulterated with stearic acid or ow.

r'ic. Under this head we may ous sorts of candles moulded fatty acids of both animal and n. The principal sources whence cturers derive their acids are l, and cocoa-nut oil. The pro- ed for separating them are cribed under Stearic Acid. d of the fatty acids can now as to imitate and almost rival and spermaceti; and they are as the nearly obsolete mould l of common tallow. They are ; they do not grease the hands, n away brightly and steadily, off any offensive odour. Un- are snowy white, but a yellow tly given them by gamboge.

low. From ordinary tallow or hich has been freed from much id by pressure. These have so odour and are so apt to gut- will probably ultimately dis- se. They are, however, sold at , that among the lower classes g retain their hold. For dip ks are immersed in melted tal- rubbing with the hands, are t and allowed to harden, after arranged upon the "broaches" sing. For mould candles, the s omitted. Great care is taken on that yields the least possible after burning.

s of "dipping," the "dipping filled with tallow of a proper rom the boiler, one of the ed with wicks is placed upon the pping beam," and pressed down e melted fat; it is then with- toms of the candles just touched d placed on one side of the cis- urpose, and the frame removed This operation is repeated until uire a sufficient size, when they ed, sorted, weighed, and strung ale.

ndles once in common use were made of the finer kinds of tallow only; a mixture of 3 parts of sheep, with 1 part of ox suet, being preferred. See Wax.

CAN'DLESTICKS. Metallic, earthenware, and porcelain candlesticks, snuffers, and snuffer-stands, are recommended to be cleaned by pouring boiling hot water on them (previously placed in an earthen pan), and, after wiping them quite dry with a cloth, to clean them with a piece of wash leather; those made of silver, or of plated copper, may be finally polished with a little plate powder; those of white metal, with a little whiting or fine chalk, and those of brass, with a little rotten-stone or one of the polishing pastes. For articles of this kind, made of bronze and papier maché, the water should be used only hot enough to melt the tallow, and they should be only gently dabbed or rubbed off with a very soft cloth or leather. The common practice of placing candlesticks before the fire to melt off the grease is injudicious, as the solder or japan about them is almost certain to be injured. Hence the common annoyance of damaged or "crippled" candlesticks in houses where there are careless servants.

CAN'DYING. When the object is simply to form a confection or sweetmeat, imbued with the aroma, flavour, or medicinal property of any substance, candies are generally prepared by simply boiling lump sugar with a sufficient quantity of the infusion, decoction, tincture, expressed juice, or sometimes even the powder of the particular article, until a portion taken out and cooled becomes quite solid, when it is either poured out on a marble slab, or into tin, marble, or paper moulds, dusted with powdered lump sugar.

When the object is to preserve the form and character of the vegetable in the candy, the substance is boiled in water until soft, and then suspended in concentrated syrup (in the cold), until they become transparent; after which they are either dried in a current of warm air, or in a stove, at a heat not exceeding 120° Fahr. The syrup must be kept fully saturated with sugar by reboiling it once or twice during the process.

Another method occasionally employed by confectioners for almonds and the like is to put the substances into a syrup boiled until it forms a small thread between the opening fingers, and to stir the whole until it is nearly set. See Sugar Boiling.

The following are the principal candied articles kept at the shops:—

Candied Al'monds. From blanched almonds, roasted and halved.

Candied Angel'ica. *Prep.* 1. From the root. Boil the fresh roots (after slicing them and removing the pith) in water, to deprive them of part of their bitterness and aroma; then drain them and put them into syrup boiled to a full candy height, and boiling hot; let them *remain until nearly cold,* when they may be *taken out and carefully* dried.

2. From the stems. From the tender stems, stalks, and midribs of the leaves, as last. Used as a sweetmeat and dessert. It is said to be cordial, stomachic, tonic, and aphrodisiac.

Candied A'pricots. From the fruit, scarcely ripe, either whole or cut into quarters, immersed in the syrup (hot), without any further preparation.

Candied Cit'rons. From the peels.

Candied Erin'go. From the roots, slit and washed.

Candied Gin'ger. From the roots of green ginger.

Candied Hore'hound. From a strong decoction or infusion of the root, and lump sugar, 1 pint to 8 or 10 lbs. may be used. Boil the mixture to a candy height, and pour it whilst warm into moulds or small paper cases well dusted with finely powdered lump sugar; or pour it on a dusted slab and cut it into squares.

Candied Lem'on Peel. As Candied Citron.

Candied Or'ange Flow'ers. From the flowers deprived of their cups, stamina, and pistils (2 oz. to each lb. of sugar), as Candied Almonds, but poured out on a slab.

Candied Or'ange Peel. From the peel of the Seville orange, or common orange, as Candied Citron.

Candied Su'gar. See SUGAR BOILING.

The following are articles of a more special character.

Candy, Car'away. 1. From caraway seeds (in fine powder), ½ oz.; sugar, 1 lb.

2. Oil of caraway, 1 dr.; sugar, 1 lb.

Candy, Diges'tive. *Syn.* LIVE-LONG CANDY. *Prep.* 1. Rhubarb and bicarbonate of soda, of each, 1 dr.; ginger, ½ dr.; cinnamon, 20 grs.; (all in fine powder;) heavy magnesia, 1 oz.; powdered sugar, 2 oz.; mucilage of tragacanth, q. s. to form a lozenge mass; to be divided into small squares of 18 or 20 grs. each.

2. As the last, but adding finely powdered caraways, 1 dr.; oil of caraway, 15 drops; and sugar, 1 oz. Both are used as heartburn and digestive lozenges.

Candy, Gin'ger. *Prep.* 1. From ginger (in coarse powder), 3 oz.; boiling water, 1½ pint; macerate in a warm place for 2 hours, strain, add lump and moist sugar, of each 5 lbs., and boil to a candy.

2. Ginger (in very fine powder), 1 oz.; powdered sugar, 2 lbs.; syrup, q. s. to make a paste. Stomachic and carminative.

For various sweetmeats which might come under the head of CANDY, see CONFECTIONS, DROPS.

CAN'NON METAL. See GUN METAL.

CANTHAR'IDES. *Syn.* SPANISH FLIES, BLISTERING F., LYT'TÆ; CANTHAR'IS, B. P. The *Cantharis vesicatoria* of Latreille, commonly known as the *Spanish fly*, is an insect of the order *Coleoptera;* it abounds in the south of France, Spain, and Italy; and has spread into Germany and the sout
When alive it exudes a strong feti
trating odour.

Pur., *&c.* These insects should
in well-closed bottles or tin can
addition of a few drops of oil of
strong acetic acid, or even a few d
stance, will preserve them unch
length of time in closed vessels. T
of their goodness is the smell.
is constantly adulterated. The
wholesale druggists is to sort ou
worthless flies for powdering, a
pensate for their deficiency of
power, by adding 1 lb. of euphorbi
12 or 13 lbs. of flies. When a su
is required, liquorice powder is
5 lbs. to every 14 lbs.), along with a
euphorbium, and sufficient blue bl
coal to turn the yellow of the liq
greenish colour. The best mode
this adulteration is by the microsc

Ant. An emetic of sulphate of zi
by the stomach-pump, if neces
vomiting may be promoted by copi
ing warm bland diluents, such as b
tea, milk, &c. Friction on the
volatile liniment and laudanum, an
quent administration of draughts
musk, opium, and camphorated em
been strongly recommended.

Tests. By the microscope, very
ticles may be discovered in the s
intestines, on a post-mortem e
Orfila thus found particles of cant
body that had been interred nine m

Uses, &c. Spanish flies are used
to raise blisters, and internally, as
and diuretic, generally in the form
In excess they produce strangury, b
satyriasis, delirium, convulsions, an
TINCTURES, VESICANTS, &c.

CANTHARI'DIN. $C_5H_{12}O_2$ Is
picrotoxin. This substance is foun
the vesicating principle of, the
Chinese blistering fly, and other
insects. *Prep.* Pulverised cant
allowed to remain in contact fo
with twice their weight of chlor
displacement apparatus. The c
then drained off, and finally displa
hol, and the solution is left to eva
cantharidin crystallises out, satu
green oil. In order to purify the
it is laid on bibulous paper, which
greater part of the oil, and then
out of a mixture of alcohol and
(Procter).

Prop. Prismatic crystals, melts
volatilises in white fumes, which s
tate the eyes, nose, and throat, an
in rectangular prisms. Cantharid
ble in water, but soluble in alcohol,
roform, acetic acid, and in the fix
tile oils. Its solution in any of
above mentioned possesses vesicat

rever, is not exhibited by solid

IC. *Syn.* INDIA RUBBER, ELAS-
a rubber is the concrete juice
'astica, *Siphonia elastica*, the
:a, and many other tropical
esh milky juice is spread over
aked clay, and is then exposed
smoke of a fire, or torches, to
t derives its dark colour. Suc-
juice are laid on, and the ope-
; repeated, until the bottles ac-
thickness. When it has become
d and dry, the clay is beaten
orm it is commonly imported.
The general properties of India
. as its numerous applications,
. The fresh juice has a cream-
e and consistence, is coagulated
s miscible with water, alcohol,
htha; sp. gr. 1·012 to 1·041; it
3⅝ to 45⅝ of solid caoutchouc,
or evaporation. By excluding
:, it may be preserved unchanged
ible period.
chouc has a sp. gr. ranging be-
nd ·941; it melts at 248° Fahr.
ass, which does not again harden
, is unaltered by chlorine, hydro-
sulphurous acid, fluosilicic acid,
stic alkaline lyes (even when
most similar substances; nitric
huric acid act on it only by long
concentrated. Some specimens
e are harder than gutta percha
ally inelastic, whilst others never
dify, but remain in a condition
at of birdlime or printers' var-

lvents of caoutchouc are rectified
er (which has been washed with
ove alcohol and acidity), chloro-
de of carbon, a mixture of bi-
arbon and absolute alcohol (94
o 6 or 7 of the last), and caout-
these liquids dissolve India rub-
the cold, and leave it unaltered
n. The first two, are, however,
to be generally employed. The
lisagreeable odour, but are much
the rest, and possess the advan-
g the film of caoutchouc in a
onger condition than other sol-
nous oil of turpentine is another
od solvent. Benzol, rectified
l-tar naphtha, crude petroleum,
entine, dissolve India rubber by
and trituration, (with heat,)
merely form with it a glutinous
s very slowly and imperfectly,
h reduced in hardness and elas-
ats and fixed oils also readily
chouc (with heat), forming per-
inous solutions or pastes; so also
s volatile oils, but the solutions
rity of them dry with difficulty.

One of the most remarkable properties of India rubber is the great amount of heat which is disengaged during its condensation by pressure or in the exercise of its elasticity. During the process of kneading the raw caoutchouc in the "masticators," the cold water thrown in to reduce the temperature soon becomes boiling hot. When no water is added, a temperature so high is often reached as to occasion the melting of the rubber. This is particularly the case during the process of "dry kneading" with quick-lime. A tube 2½ inches in diameter, impactly secured, was subjected to a force of 200 tons. The result was a compression amounting to 1-10th; great heat was evolved, and the excessive elasticity of the substance caused a flywheel weighing five tons to recoil with alarming violence. Mr. Brockedon states that he succeeded in raising the temperature of an ounce of water 2° in about fifteen minutes by collecting the heat evolved by the extension of a small thread of caoutchouc. He refers this effect to the change in specific gravity, and contends that the heat thus produced is not due to friction, because the same amount of friction is occasioned in the contraction as in the extension of the substance, and the result of this contraction is to reduce the caoutchouc thus acted upon to its original temperature.

The edges and surfaces of India rubber are readily and perfectly joined by mere contact and intense pressure. On the small scale, the edges may be moistened with ether, naphtha, oil of turpentine, or some other solvent, or by long boiling in water, and immediately pressed tight together, and held in contact for some time.

Elastic tubes are readily formed of India rubber, by cutting it into uniform slips of proper thickness, and winding them round rods of polished glass or metal, so that the edges are in close contact or "overlapping." A piece of tape is then wound round outside it, and the whole boiled in water for 2 or 3 hours, after which time the edges will be found to be sufficiently adherent. A better plan is to immerse the "rubber" in a mixture formed of bisulphide of carbon, 95 parts, and rectified spirit, 5 parts, until it swells into a pasty mass, which may then be moulded into any desired form, or passed through the die of a tubing machine. For chemical purposes, brewing, &c., vulcanized India-rubber tubing has now taken the place formerly occupied by the unprepared material.

The once celebrated "Mackintoshes" are made by spreading two or more coats of a paste made of caoutchouc and rectified coal-tar naphtha over the surface of the stuff or cloth, and when it has become partially dry, pressing two such surfaces evenly together by passing the goods between a pair of cylinders or rollers. The articles are then placed *in a stove room for the* composition to harden, *and to remove the odour* of the naphtha. Of late years, vulcanized or mineralized rubber (coloured) has been used for this purpose, and being spread on the outside of the stuff instead of the inside, forms an ornamental and thoroughly waterproof material.

India-rubber thread is prepared by stretching it (previously cut into coarse filaments) to 5 or 6 times its length in boiling water or hot air, in which state it is allowed to cool slowly. This process is repeated again and again, until it reaches 16,000 or 17,000 times its original length, when it is glazed by agitating it with powdered sulphur, or French chalk. This thread is readily joined or "pieced," as it is called, by paring the ends obliquely with a pair of scissors or a knife, and then pressing the clean ends strongly together with the fingers. When the coarse filaments from the cutting machine are simply stretched with the moistened thumb and finger in the act of "reeling" to about 8 or 9 times their length, they are said to be "inelasticated," and are ready to be made into elastic braces, elastic web, and other like elastic tissues and fabrics, in the braiding machine.

Caoutchouc, Vul'canized. *Syn.* VULCANIZED INDIA RUBBER, MINE'RALIZED I. R., SUL'PHURETTED I. R. The discovery of the singular action of sulphur and the mineral sulphides on caoutchouc was made by Mr. Charles Goodyear, of New York, in 1842, at which date the manufacture of vulcanized India rubber may be said to have commenced. In 1843 Mr. Thomas Hancock patented a process for vulcanized India rubber in these countries, founded on that of Mr. Goodyear. A sheet of caoutchouc immersed in melted sulphur absorbs a portion of it, and at the same time undergoes important changes in many of its leading characteristics. So prepared, it is no longer affected by changes of temperature; it is neither hardened by cold nor softened by any heat insufficient to destroy it. It loses its solubility in the solvents of ordinary caoutchouc, whilst its elasticity is greatly augmented, and has become permanent.

The same effect is produced when sulphur is kneaded into caoutchouc in a masticator, or by means of powerful rollers, as well as when common solvents (naphtha, spirit of turpentine, &c.) are charged with a sufficient amount of sulphur, in solution, to become a compound solvent of the rubber. In these cases articles may be made of any required form before heating them for the change of condition, technically termed "vulcanization." It is necessary, however, for this purpose, that the form should be carefully maintained both before and during the exposure to the heat.

"A vulcanized solid sphere of 2½ inches in diameter, when forced between two rollers ¼ inch apart, was found to maintain its form uninjured. In fact, it is the exclusive property of vulcanized caoutchouc to be able to retain any form impressed upon it, and to *return to that form* on the removal of any disturbing force which has been brough upon it." (Brockedon.)

Caoutchouc combines with from 1 of sulphur; the quantity of sulphur the naphtha paste should not, the ceed 10% or 12% of its weight.

The temperatures for vulcaniza common method range from 220° and the period required is one hour according to the temperature. A temperature is, however, sufficient, ration of the exposure is much ext the compound mass is softened wi the common solvents of India rubber,

The process of sulphuring, or min is differently conducted in different tories. Under Mr. Burke's patent, or amorphous sulphide of antimony by decomposing a solution of crude in a lye of potash or soda, with hyd acid) is employed. This powder he with either India rubber or gutta mixtures of them, by kneading in a " tor" for 2 or 3 hours, and after pression in a mould whilst still warm poses the mass to a steam heat rangi 250° to 280° Fahr. The block, so is afterwards cut into sheets, &c. The tages possessed by the product are, possesses no unpleasant odour, nor sulphur effloresce on its surface, as in vulcanized India rubber.

Under Mr. Christopher Nickels's (1849) 1 part of sulphur is kneaded parts of caoutchouc, and then pre moulds, as before. He also vulcanizes by exposing it in a cylinder heated in a jacket to the fumes of sulphur or phuretted gases, given off from a ret nected with the apparatus. The rubber prepared he next subjects to hydraulic sure in moulds, at a temperature rangi tween 220° and 250° Fahr.

Small articles or sheets of India rubber be extemporaneously vulcanized at com temperatures by simple immersion, minute or two, in a mixture of bisulphi carbon, 97½ parts, and protochloride of phur, 2½ parts; after which they must b washed first in weak alkaline lye, and pure water. Mr. Parkes employs 100 of 97½ parts of the bisulphide. This is termed "cold sulphuring."

An excellent method of vulcanization commended by Mr. Parkes, particularly cable to small articles, consists in imm them for about 3 hours in a close vessel taining a solution of polysulphide of sium at 25° Baumé (sp. gr. 1·197), and at temperature of 240° Fahr. It is afterw washed in an alkaline lye, then in pure and dried.

Among the many applications of vulc India rubber those connected with its ticity and its enormous contractile power extended are particularly striking.

patent, "torsion springs" for
oor springs, clock springs, car-
&c., are made of it. Mr.
ther patent, has availed himself
roperty as a new mechanical
lengths of caoutchouc, which
lcanized power purchases," are
awn down from or lifted to a
and attached to any weight
uired to raise; when a sufficient
e power purchases are fixed to
eir combined elastic force lifts
und. Thus, 10 purchases of the
h each of 50 lbs. raise 500 lbs.
is 6 inches long, and contains
f vulcanized caoutchouc. These
if stretched to the limit of their
of their cohesive strength), will
xceeding 650 lbs.

principle has been applied to re-
lise the strain on ships' cables,
ere several boats are towing one
s a projectile force. A number
hases, attached to the barrel of
ucted to project harpoons, will
r, if suddenly relieved, propor-
ir aggregate forces. By similar
balls may be projected 200 yards
a charge of No. 4 shot can be
yards. A bow, in which the string
ic (the reverse of the usual form),
ntrived which throws a 30-inch
rds.

great improvement in the manu-
outchouc is the discovery that by
he process of vulcanization for a
at an increased heat and under
hard black substance is obtained,
be turned in a lathe like ebony.
nce has already been applied to an
ry number of uses. See VUL-

dingly useful combination of cork
rubber has lately been introduced.
ULICON.

e, Facti"tious. See CONSOLI-

HOUCIN. An extremely light fluid
y distilling India rubber.

(Barnard's patent process.) A
tile fluid, discovered by Mr. Bar-
dia rubber or caoutchouc, as im-
into small lumps, containing about
ches each, is thrown into a cast-
nnected with a well-cooled worm-
t vessel with a large evaporating
l do, the entire top of which can
d for the purpose of cleaning it
heat is applied in the usual way,
hermometer ranges to about 600°
n nothing is left in the still but
rcoal. The dark-coloured fetid
has distilled over is next rectified
 its weight of water, once or
nd at each *rectification becomes*
paler, until at about sp. gr. ·680 it is colourless, and slightly volatile. The product is then shaken up with nitro-hydrochloric acid, or chlorine, in the proportion of a ¼ of a pint of the acid to 1 gallon of the liquid. To enable the dirt to be the more easily removed from the bottom of the still, common solder, to the depth of about ½ an inch, is trown in.—*Prod.* 80%.

Prop., &c. Mixed with alcohol, caoutchoucin dissolves gums and resins, especially copal and India rubber, at the common temperature of the atmosphere, and it speedily evaporates, leaving them again in the solid state. It mixes with the oils in all proportions. It has been used in the manufacture of varnishes, and for liquefying oil paints, instead of turpentine. It is very volatile, and requires to be kept in close vessels. According to the researches of Himly, Gregory, and Bouchardat, the caoutchoucin of Barnard consists of several liquids, some of which have the composition of olefiant gas, and others that of oil of turpentine.

CA"PERS. The flower buds of various species of *Capparis*, particularly *C. spinosa*, caper tree, preserved in vinegar. They are chiefly imported from Spain, Italy, and the South of France, where the caper tree is largely cultivated for the purpose. The flower-buds are picked daily, and thrown into a cask of strong pickling vinegar, until it becomes full, when it is sold to the dealers by the collector. The former sort them into different sizes by means of copper sieves, in a similar way to that adopted for lead shot and gunpowder. In this way they are divided into *nonpareilles*, *capuchins*, *capotes*, *seconds*, and *thirds*, of which the former, or smallest, are regarded as the best; but much depends upon the quality of the vinegar.

The lively green colour of capers, so much valued by the ignorant, arises chiefly from the presence of copper derived from the sieves used in sorting them. In many cases, copper coin, as sous and halfpence, are added for the purpose. Thus the eye is gratified at the sacrifice of the stomach, and an insidious poison introduced into the system, simply to give an unnatural appearance to a condiment which tastes better without it. See COPPER.

CAPILLAIRE'. [Fr.] Simple syrup, or a concentrated solution of sugar in water, flavoured with orange-flower water, or some other similar aromatic. The name was originally given to a mucilaginous syrup, prepared by adding to an infusion of maiden-hair (*Adiantum capillus Veneris*) some sugar and orange-flower water.

CAP'NOMOR. See KAPNOMOR.

CAP'RIC ACID. $HC_{10}H_{19}O_2$. *Syn.* RU'TIC ACID; ACIDUM CAP'RICUM, L. An acid discovered by Chevreul, and obtained by decomposing caprate of barium with dilute sulphuric acid, *or primarily by the saponification of butter or cocoa-nut oil*, when it appears combined *with butyric, caproic* and caprylic acids. It is also procured by acting upon oleic acid or oil of rue with nitric acid.

Obs. When butter is saponified with caustic potassa or soda, and the resulting soap decomposed by adding an acid, in excess, and distilling the mixture, the four acids above named pass over into the receiver, in combination with water. The mixed acids may be separated by saturating them collectively with baryta, and by taking advantage of the unequal solubility of the newly formed barium salts. The less soluble portion (equal to about $\frac{1}{10}$th of the dry mass) contains capric and caprylic acid; the larger and more soluble portion, butyric and caproic acid. On the same plan, the two groups are resolved into their separate acids. These acids are deprived of their uncombined water by means of chloride of calcium. It is advisable to employ the term rutic acid, as the older term is easily confounded with caproic and caprylic.

Prop. Capric or rutic acid crystallises in fine needles, which fuse at 86° Fahr., giving out an odour resembling that of a goat. It is sparingly soluble in boiling water.

Prep. (Miller.) Castor oil is saponified by means of potassa or soda, and afterwards an excess of the hydrated alkali is added, amounting to one half the oil used. The mass is heated in a retort, and an oily liquid covered with water distils over. This oily liquid, which is the octylic alcohol, is rectified several times with potassa until the residue is no longer coloured brown.—*Prop.* A colourless liquid, of powerful aromatic odour; insoluble in water, but dissolving readily in acetic acid, ether, and alcohol. Its boiling-point is 356° Fahr., its sp. gr. ·823. The caprylate of ethyl, erroneously termed caprylic ether, is a colourless liquid, with an agreeable odour of pineapples.

CAP'SICINE is the name given to an alkaloid obtained from the *capsicum* or Cayenne pepper. It has a burning taste, and when quite pure crystallises. It forms crystallisable salts with acetic, nitric, and sulphuric acids.

CAP'SICUM. [L. and Eng.] *Syn.* CHIL'I, RED PEPPER. A gen. of plants belonging to the natural order *Solanaceæ*, species of which yield the fruits which are used to form *Cayenne pepper* and *Chili vinegar*. The officinal capsicum of B. P. is the fruit of the species *C. fastigiatum*. See PEPPERS, TINCTURES, VINEGARS.

CAP'SULES. This term is now commonly applied to small egg-shaped or spherical vessels, in which medicines are placed, for the purpose of covering their nauseous taste, at the time of swallowing them. They are commonly made of gelatin, mixtures of sugar and gelatine, or animal membrane.

Capsules, Gel'atin. *Prep.* 1. By dipping the bulbous extremity of an oiled metallic rod into a strong solution of gelatin. When the rod is withdrawn, it is rotated, in order to diffuse the fluid jelly equally over its surface. As
soon as the gelatinous film has pa
ened, it is removed from the mould
on pins, furnished with suitable
fixed on a cork table. When suf
the capsules are placed upright in
made in the table to receive the
liquid with which they are to be f
introduced by means of a small
They are next closed by dropping
melted gelatin on the orifice of
parts of gelatin, and one part of s
the common proportions.

2. (Simonin.) Oval balls of
requisite size, are prepared by
into a wooden mould, consisting
and arranged for the reception
these balls. These are afterwar
iron needles, affixed to rods of cor
in rows. The balls are now unif
all at once by dipping in the us
then removed from the needles, a
placed with the needle holes dow
gently heated plate, when the wa
and a round capsule is left behind.

Capsules, Gel'atin and Su'gar.
raud.) Gelatin, 6 parts; solution
simple syrup, of each, 1 part; wa
melt in a water bath, remove th
proceed as before.

Capsules, Glut'en. These, whic
subject of a French patent, are
formed of the gluten of wheat f
stance which is insoluble, althou
by water. We have placed these
twenty-four hours in warm wate
them, at the expiration of that ti
broken, the enclosed medicine bein
enveloped. The mode of prepara
secret.

Capsules, Mem'branous. *Syn.* Ox
SULES. From gut-skin moistened a
over an oiled bulb of glass or met
in the common way. These hav
tented, but they do not appear
improvement on the common
gelatin.

Obs. The common capsules
about 10 or 12 grs. of balsam
Those of the shops, in nine cases ou
filled with adulterated copaiba,
4-5ths of them are filled with tra
seed oil, to which a few drops
balsam are added.

Balsam of copaiba (capivi) and
or a mixture of them, castor oil
oil, are the substances most usua
tered in this way. *Baccæ copaif*
are officinal in the Ph. Castr. R
has proposed to grease them an
them per anum. Ricord has str
mended capsules of copaiba, coated
of rhatany, as much superior to
ones of copaiba alone, in the treatm
and gonorrhœa. They may be ea
by either of the following methods

1. By immersing, for an insta

n a mixture of extract of rhatany
ared from the root), 3 parts;
t sugar, 1 part; mucilage of gum
rt; melted together in a water

ing the bodies of the capsules
e mixture or composition, instead
in, and then following the same
s as for the manufacture of the
tin capsules.
ules are said to sit well upon the
tone of which they contribute to
l to act with greater certainty
made of copaiba and gelatin

L. A dark-brown product ob-
ating sugar. It is formed during
of all materials containing sugar,
e and malt. It is much used for
oups, wines, spirits, and other

Crude. *Syn.* SPIRIT COLOURING,
AR. *Prep.* From cane sugar, by
o from 410° to 428° Fahr., as long
vapour is formed; dissolving the
water, and concentrating the solu-
oration.
Pure. *Prep.* 1. (Graham.) Crude
tained as above, is placed on a
paper dialyser. The undecomposed
certain intermediate compounds
with considerable facility, and what
remains on the dialyser possesses
the colouring power of the original
mel, weight for weight. See DIA-

pt.) Add strong alcohol to a filtered
olution of crude caramel until it
produce a precipitate; collect the
, which is caramel, on a filter, wash
ol, and dry. Graham recommends
product should be dissolved and pre-
four or five times, or till the mass
ws, from being plastic at first, be-
verulent.
. Pohl.) Cane sugar is heated in a
etallic vessel by means of an oil
0° or 419° Fahr. as long as aqueous
scape, the mass being occasionally
ith a spatula. The mass is then
dered and digested with alcohol for
ree hours; the digestion is repeated
uid no longer tastes bitter.
solution containing 10% of purified
gummy, and forms a tremulous jelly
g. Evaporated *in vacuo*, it dries up
ck shining mass soluble in water;
solution be evaporated to dryness
t of a water bath, the whole matter
l insoluble in hot or cold water. A
proportion of caramel suffices to
sepia tint to water.

A weight of 4 grains used in
amonds, which are spoken of as
y carats weight. *Among assayers,*
s weight of 12 grains; but more commonly a proportional weight or term, representing the number of parts of pure gold in 24 parts of the alloy; pure gold being spoken of as of 24 carats fine. It is commonly the 24th part of the "assay pound," and is nominally subdivided into 4 assay grains, and these again into quarters. See ASSAYING.

CAR'AWAY. *Syn.* CARAWAY SEED; SEMENA CARUI, L.; CARUI, B. P. The fruit of the *Carum Carui* (Linn.), an umbelliferous plant, common in England and other parts of Europe. These fruits, commonly called "seeds," form an agreeable and useful aromatic and carminative, and are especially esteemed in the flatulent colic of children. They are also largely employed as an adjuvant or corrective in various officinal preparations; and as a flavoring ingredient in cakes, biscuits, cordials, confectionery, &c. See ESSENCES.

CARBAZOT'IC ACID. See PICRIC ACID.

CARBOL'IC ACID. $H.C_6H_5O$. *Syn.* PHENYLIC ACID, PHENIC ACID, PHENOL, PHENYLIC ALCOHOL, HYDRATE OF PHENYLE, HYDRATED OXIDE OF PHENYLE. A powerful antiseptic substance obtained from coal-tar oil.

Prep. Crude, heavy coal oil is agitated with milk of lime, allowed to stand, and the aqueous portion separated from the undissolved oil and decomposed by hydrochloric acid. The oily liquid obtained is purified by distillation.

1. Crude coal oil is distilled in a retort furnished with a thermometer, and the portion which passes over when the heat ranges between 300° and 400° Fahr., is collected apart, and mixed with a hot saturated solution of caustic potassa; after standing for some time, a semi-crystalline pasty mass forms, from which the supernatant liquid is decanted; the pasty mass is now agitated with a small quantity of water until dissolved; the solution thus formed separates into two portions, the denser of which contains carbolate of potassa; this being separated by decantation, is decomposed by hydrochloric acid. The solution of carbolic acid which rises to the surface is digested with chloride of calcium, to remove water, and purified by distillation; the distillate, by refrigeration, furnishes crystals of the acid, which must be drained, dried, and preserved from the air.

2. From salicylic acid. Mix intimately together equal weights of salicylic acid and powdered glass; introduce the mixture into a good German retort, and heat on a sand bath, gradually raising the heat till it becomes red hot at the bottom. The vapour is condensed in any convenient receiver. If the materials are perfectly dry, it solidifies to a mass of crystals as soon as it condenses, but if there be a trace of water present it remains liquid. The slower it distills over, the lighter will be the colour, while if a high temperature be employed it comes over nearly black. It may be rendered colourless and anhydrous by rectification over *quick-lime.*

Of late years the manufacture of carbolic acid has increased to a great extent, and is generally found in a pale yellow clear solution, instead of as a dark hazy liquid. The pure anhydrous acid is in long, colourless, prismatic crystals, often, however, on keeping turning a beautiful pink, rose, or crimson, and which rapidly deliquesce in moist air, becoming converted into a colourless refractive liquid, having a faint odour of roses and tar. Carbolic acid is poisonous, and is a powerful antiseptic.

Uses. The extraordinary antiseptic properties of carbolic acid have long been known, but its extended use has been delayed, owing to the difficulty experienced in obtaining it in considerable quantities. It is now, however, principally owing to the labours of Dr. F. Crace Calvert, produced on a large scale, and this chemist has proposed its application to many valuable purposes. As a medical agent, it seems to have all the useful properties of creosote in an exalted degree, with some peculiar actions of its own, and is being applied with marked success in the Manchester Royal Infirmary and similar institutions, in cases of chronic diarrhœa, obstinate vomiting (even after creosote has failed), and as a disinfecting wash for ill-conditioned ulcers and gangrenous sores. It has also been applied successfully in cases of foot-rot, a disease which annually carries off large numbers of sheep. It has been employed for the preservation of gelatin solutions and preparations of size made with starch, flour, and similar materials, and of skins and other animal substances. It appears to act strongly as an antiferment, and Dr. Calvert states that it is one of the most powerful preventives of putrefaction with which he is acquainted. Commercial creosote is frequently nothing more than hydrated carbolic acid.

CAR'BON. C. *Syn.* CARBO'NIUM, CAR'BO, L.; CHARBON, Fr.; KOHLENSTOFF, Ger. An elementary or simple non-metallic solid body, very widely diffused through nature. Its purest and rarest form is that of the diamond. Nearly pure, it occurs very abundantly in the forms of graphite and anthracite. In combination with oxygen, as carbonic acid, it exists in the atmosphere and in the waters of most springs, also in limestone, marble, chalk, and dolomite. Combined with hydrogen, it enters largely into coal, peat, and lignite. It is an essential constituent of organic matter, and hence it has been termed the "organic element." Charcoal, lamp-black, and coke, are more or less pure forms of carbon. By strongly igniting lamp-black in a covered crucible, the element is obtained sufficiently pure for most chemical purposes.

It is best obtained purest by burning a jet of pure olefiant gas in an atmosphere of pure chloride, collecting the amorphous carbon deposited, and igniting *in vacuo* at a red heat.

Forms several chlorides, sulphides, &c., of *which the following* are the chief:—

Carbon, Protochloride of. Obtained from
the sesquichloride by subliming i
through a tube filled with fragm
heated to redness. A transparen
liquid, with aromatic odour.

Carbon, Sesquichloride of. C_2Cl
by exposing Dutch liquid with ch
glass vessel, to the direct rays of th
care to renew the chlorine as long
sorbed. The liquid is ultimatel
into the sesquichloride of carbon,
white, crystalline, volatile substan

Carbon, Oxychloride of. $COCl_2$
ROCARBON'IC ACID, PHOSGENE
RIDE OF CARBONYL. Equal meas
bonic oxide and chlorine are ex
direct rays of the sun; they com
come condensed to half their vol
colourless, suffocating gas, whic
diately decomposed by water into
hydrochloric acids.

Carbon, Sulphide of. CS_2. *Syn.*
OF CARBON, CARBON DISULPHIDE,
OF CARBON. Bisulphide of iron (
5 parts, and fresh dry charcoal,
heated together in a stoneware
nished with a glass tube, having t
and passing nearly to the bottom
or receiver filled with pounded i
sulphide of carbon collects at th
the receiver, and is then purified fr
moisture and sulphur by distilling
temperature, from fused chloride

By passing the vapour of sulph
ments of charcoal, heated to brigh
a porcelain tube, and collecting th
before.

Prop., Uses, &c. A colourless, p
liquid, having the sp. gr. 1·27.
ingly volatile, boiling at 118·5° Fa
never been frozen. It is highly i
burning with a pale-blue flame, an
sulphurous and carbonic acid gase
dissolves sulphur, phosphorus, and
substances, and by spontaneous
deposits the first in beautiful cr
solution of phosphorus is much us
typing objects, which are coated
ducting film by its means. Its refr
is remarkably high, and on this
employed to fill hollow lenses for
and other optical instruments.
intense cold by its evaporation.
mometer, having its bulb covered
if dipped into this fluid and susp
air, rapidly sinks from 60° to 0
into the receiver of an air-pump
—81° Fahr. A mixture of sulph
and solid carbonic anhydride for
most powerful frigorific agent
phide of carbon is now prepared
scale, and extensively employed a

It is stated that the odour of
carbon can be readily removed b
to stand over mercury or corros
for some time, and then redistilli

CAR'BONATE, a salt in which

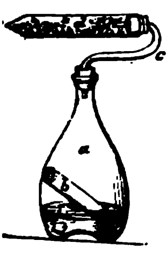
) carbonic acid (H_2CO_3) is re-
al or other basic radical.

The processes by which the
bonates and many others are
escribed under the respective
f the earthy carbonates are
ly in nature. In general, the
s may be formed by adding an
ate to a salt of the metal in
ble decomposition.

carbonates of the alkalies are
r; those of the other bases are
part insoluble, except the water
ged with carbonic acid. From
rbonic anhydride or anhydrous
n be easily expelled by heat.

carbonates are easily distin-
e following reactions:—They
effervescence in hydrochloric
st other acids; in some cases a
required to promote the disen-
he gas.—The gas evolved in the
to lime water and baryta water,
e precipitates, which redissolve
ffervescence, and after the solu-
boiled are not reprecipitated by
onia.—Chloride of calcium and
rium give white precipitates in
the neutral alkaline carbonates,
ns of the alkaline bicarbonates
dition; and the precipitates are
e with effervescence in acetic

e quantity of the metal in an
rthy carbonate may be easily de-
the ordinary volumetric methods
(which *see*), and the quantity
id, by the method of Fresenius
ALKALIMETRY). The apparatus
or preferably that shown in the
ALIMETRY, may be used instead
complicated contrivance of the
ists.



ining the sample of carbonate for exa-
topped by a closely fitting cork, through
s the bent tube (*c*).
e, sufficiently long to maintain a slanting
thout falling, filled with sulphuric or
s acid.
, connecting the flask with (*d*).
tube, filled with small fragments of fused
ide of calcium, with a fine orifice at
ly (*d*).

[illegible] above, which is that commonly used, a weighed sample of the carbonate to be examined is placed in the flask (*a*) along with a little water, and the small tube (*b*), filled with either sulphuric or hydrochloric acid, is carefully introduced. The cork, with its chloride of calcium tube (*d*), is then fitted to the flask, and the whole apparatus very accurately weighed.

On inclining the apparatus the acid escapes over the side of the small tube, and mixing with the liquor in the flask, expels the carbonic acid of the carbonate, which is then dried by passing over the chloride of calcium. After effervescence has ceased, heat should be applied to the bottom of the flask, until it be filled with steam, to expel the carbonic gas it contains. The loss of weight gives the weight of the carbonic acid gas that was contained in the sample. The quantity of carbonic acid in the carbonates of the metals that do not contain water, may be determined by heating them to redness in a platina crucible.

CARBONIC ACID, H_2CO_3. True carbonic acid has not yet been obtained in any satisfactory condition, although the solution of carbonic anhydride (often called carbonic acid), or anhydrous carbonic acid, is generally regarded as such. It forms with bases an important series of salts, called the carbonates, by double decomposition.

CARBONIC ANHYDRIDE. CO_2. *Syn.* CARBONIC ACID, CARBON DIOXIDE, FIXED AIR, CHOKE DAMP; ACIDE CARBONIQUE, Fr.; KOHLEN SÄURE, Ger. A compound formed by the chemical union of carbon and oxygen.

Hist. Van Helmont recognised carbonic acid as a peculiar gas. Dr. Black, in 1757, proved that it was a constituent of limestone, and gave it the name of fixed air; he also showed that the causticity of alkalies depended on its absence. Bergmann first described it as an acid, applying to it the term aërial acid. Lavoisier, in 1776, established its true nature, and gave it the name it now bears. Faraday, in 1823, by pressure at an extremely low temperature, reduced carbonic acid to a liquid, and a few years later Thilorier and Brunel obtained it in the solid form.

Nat. hist. Carbonic acid is a constituent of the atmosphere, its presence being essential to the existence of vegetable life on the globe. It issues from the earth in many situations, as the Grotto del Cane in Italy, the Valley of Poison in Java, and near the Lake of Laach in Germany. It gives to many mineral springs their sparkling brilliancy, and is held in solution by all natural waters. Combined with the bases, lime and magnesia especially, it exists in large quantities in the crust of the earth. It is the chief product of combustion, and one of the products of fermentation. It is always being exhaled by animals in the process of respiration, and in smaller quantities *by plants at night* or in the shade. It *forms the terrible "choke-damp" or "after damp" of the coal* mines. It is the gas disengaged during the effervescence of soda water and other aërated drinks, and the cause of the freshness of newly drawn beer.

Prep. Hydrochloric acid, 1 part, diluted with water, 4 or 5 parts, is poured upon fragments of white marble, previously placed in a suitable generating apparatus.[1]

Carbonic acid is rapidly evolved, and may be collected, with some loss, over water in the pneumatic trough. If required dry, the gas must be passed over fragments of fused chloride of calcium, placed in a large tube, or through a small quantity of concentrated sulphuric acid, and collected by displacement or over mercury.

From oil of vitriol, 1 part; water, 6 parts; and chalk or whiting, 1¼ part; mixed in a suitable vessel, applying agitation.

Prop. Under ordinary conditions, carbonic acid is a colourless, non-inflammable, irrespirable gas, possessing a slightly pungent odour, and an acidulous taste. Water absorbs its own volume of this gas, and by pressure may be made to take up enormous quantities, forming carbonated or aërated water. Its sp. gr. is 1·520, hence it may be poured from one vessel to another like water. By a pressure of thirty atmospheres at 32° Fahr., it is liquefied, the pressure required decreasing as the temperature gets lower. At —94° Fahr. it solidifies into a vitreous transparent mass.

Carbonic acid, even when greatly diluted with air, cannot be inhaled without insensibility following. An atmosphere containing more than its natural quantity of the gas (1 part in 2500 parts, by measure) acts upon the system as a narcotic poison, hence the danger of overcrowded rooms. It is a non-supporter of combustion, at once extinguishing a lighted candle, gas-jet, or even a piece of burning phosphorus, when these are placed in a jar of the gas.

Tests. It feebly reddens litmus paper, extinguishes the flame of a burning taper, and forms a white precipitate in aqueous solutions of lime and baryta, which is soluble in acetic acid. By the last test, a very small quantity of this gas may be easily detected in the atmosphere of rooms, &c. A lighted candle is generally used to test an atmosphere suspected to contain carbonic acid; but it is found that air that will support combustion will contain sufficient of this gas to cause insensibility.

Ant., &c. The patient should be immediately removed into the open air, and placed on his back with the head slightly raised. Cold water should be dashed over the body, hot water or mustard poultices applied to the feet, and ammonia (carefully) to the nostrils. Brandy-and-water and other stimulants may be administered. Continued friction on the surface of the body is also very useful. If the
patient has ceased to breathe, arti
tion should be attempted. This
by gently pressing down the ribs,
up the diaphragm, and then su
drawing the pressure. The inh
mixed with very little chlorine
been recommended. Wells, cell
underground apartments, contain
acid in poisonous quantities, may
this gas by pumping it out, in t
as water, observing to allow the
to fully reach the floor or bottom
Fresh slaked lime or milk of li
thrown in, will have a like effec
ing the gas. Free ventilation,
can be established, is, however,
cheapest, but the most efficient
ASPHYXIA.

CARBON'IC OXIDE. CO. *Syn*
OF CARBON, CARBON MONOXID
OXIDE OF CARBON; OXY'DUM C
L. A gaseous compound of carb
gen, containing less oxygen than
in carbonic acid.

Prep. 1. From carbonic acid ga
fragments of charcoal, heated to
tube of porcelain or iron.

2. From crystallised oxalic acid,
with 5 or 6 times its weight of st
ric acid in a glass retort.

3. From ferrocyanide of potas
powder, and 8 or 10 times its we
centrated sulphuric acid, heated
a glass retort.

Obs. All the processes except th
mixture of carbonic acid and
therefore necessary to pass the
a caustic alkaline solution or mill
deprive it of carbonic acid. It
passed over dried chloride of cal
prive it of moisture. It may be co
over mercury or water, as the la
very little of this gas.

Prop. Carbonic oxide is colou
ous, neutral, inflammable, and irr
is extremely poisonous, $1\frac{0}{0}$ mixed w
sufficient to cause dangerous drow
deaths produced by the combustio
in close rooms are now attribute
The *antidotes*, &c., are the same
ing from inhaling carbonic acid.

CAR'BURETTED HY'DROGE
DROGEN.

CARD'AMOM. *Syn.* CARD'AM
MO'MUM, B. P. The seed or
Elettaria Cardamomum forms
cardamom. It is warm, pungent,
and stomachic, and is largely use
ment in the East, and in Europe
vant in other medicines. Seve
cardamoms used medicinally and
produced by the genus *Amomum*
to the natural order *Zingiberacea*
family.

CAR'MINATIVES. Medicine
flatulency and spasmodic pains.

---

[1] A large flask, provided with a bent glass tube for conveying the gas, and a tube-funnel for introducing the acid, is the most convenient form of apparatus. A tubulated retort may be used, but the generating flask or bottle is to be preferred.

inatives are ANISEED, CARAWAY
IOMB, CASSIA, CINNAMON, GIN-
IINT, and the PEPPERS. To
added ARDENT SPIRITS, and
AROMATIC ESSENCES and TINC-
IXTURES, PATENT MEDICINES,

Syn. CARMINE RED, VEGE-
r; CARMI'NUM, L. A beautiful
repared from the cochineal in-

preparation of carmine is little
at success in its manufacture
n any mystery connected with
nan on the employment of the
and the best materials, and the
oderate care, dexterity, and pa-
ollowing forms will produce car-
chest hues down to ordinary and
rding to the skill possessed by
or.

s *Cenette's process.*) Cochineal
lbs., is boiled in pure river water;
2 hours, when refined saltpetre
., is added to the decoction, and
led for 3 or 4 minutes longer;
, 4 oz., is next added, and the
renewed for 10 or 12 minutes;
now removed, and the liquid
tle for about 4 hours, after which
nted with a syphon, into shallow
ls, and set aside for three weeks.
f this time the film of mould
med on the surface is dexterously
removed, without breaking it or
e liquid beneath it. The remain-
nt very carefully removed with a
the adhering moisture, as far as
ined off, or sucked up with a
residuum, which is the carmine,
he shade, and possesses extraor-
and beauty.

r *Langlois process.*) Powdered
, is boiled in river water, 4 galls.,
, when carbonate of soda, ¾ oz.,
water, 1 pint, is added, and the
boiled for ½ hour longer; when
is cold, alum (in fine powder),
wn in, and the liquid agitated
t is entirely dissolved; after 20
se, it is decanted into another
rified by beating it with the
gs; the perfectly clear liquid is
to repose for 40 minutes or
t is decanted, and the carmine
eposited is collected, drained on
ried on shallow plates covered
per. The product by either of
cesses varies from 9½ to 10% on
the cochineal employed in them.

Spirit process.) Cochineal, 1 lb.,
15 minutes, in water, 3 galls.,
, 1 dr., is next added, and the
iled for 5 or 6 minutes; when
become cold, the clear portion
again heated, and solution of tin (spirits of tin), cautiously dropped in until all the carmine is precipitated; it is collected, drained, and dried, as before. *Prod.* 1½ oz.

3. (*French process.*) From cochineal (in powder), 1 lb., boiled for 15 minutes, in water, 3 galls.; cream of tartar (in powder), 1 oz., is then added, the boiling further continued for 10 minutes, and powdered alum, 1½ oz., thrown in; after another 2 minutes' boil, the heat is withdrawn, and in 5 or 6 minutes more, the clear portion is decanted into porcelain vessels, which are set aside until the carmine falls down.

4. (*German process.*) Powdered cochineal, 1 lb., water, 4 galls.; boil 15 minutes, add powdered alum, 1 oz.; boil 3 minutes longer, remove the heat, allow the liquor to settle for 5 minutes, pour off the clear portion into porcelain or earthenware vessels, and set them aside for 3 or 4 days. The carmine is found deposited on the bottom of the vessel, and must be now carefully drained and dried, as before. The decanted liquor yields more carmine by standing in fresh vessels. *Product.* About 1½ oz.; besides ½ oz., or more, of an inferior quality obtained as a second deposit.

5. (*English process.*) From cochineal, 1 lb., and carbonate of potash, ½ oz., boiled in water, 7 galls., for 15 minutes; the vessel is then removed from the fire, and powdered alum, 1 oz., added; the liquor is then well agitated and allowed to settle for about 15 minutes longer; the clear liquid is next decanted into a clean copper, and isinglass, ½ oz., dissolved in water, 1 pint (and strained), added; as soon as a coagulum forms upon the surface, the heat is removed, and the liquid is strongly agitated with a bone or silver spatula; after which it is allowed to repose for 20 or 30 minutes. The deposited carmine must be drained and dried, as before.

Obs. The best black cochineal is generally used for the preparation of carmine. For ordinary qualities, spirits of tin (bichloride) is added to the decoction as a precipitant, and the liquid being put into suitable vessels (wash-hand basins answer very well), a deposit of carmine slowly takes place. Neither exposure to solar light nor artificial heat is advisable during the drying, but the latter must nevertheless be effected with all possible expedition. Hence, the finer shades of carmine can only be successfully made during certain states of weather; as in very hot weather the liquid rapidly sours or ferments, and the deposit is more or less dissolved; whilst in dull, damp weather, it is difficult to dry the precipitate sufficiently, which is then apt to become mouldy, and to lose colour. The researches of Pelletier and Caventou tend to show that the solution of tin used as a precipitant, should be at the maximum of oxidation or chlorination, to produce the richest shades of carmine. That first deposited is, in all cases, the most beautiful, and the quality gradually deteriorates as the process proceeds. 6 or 7 drs. only of carmine of the very finest quality can hence be obtained from 1 lb. of cochineal.

Prop., &c. Pure carmine is a very light, lustrous, scarlet powder, entirely soluble in ammonia, a test by which its purity is readily determined. Mr. Warren De la Rue says the pure colouring principle of cochineal is carminic acid. By digesting ammonia on carmine, until all the colour is taken up, filtering and adding acetic acid and alcohol, till the whole is precipitated; and lastly, carefully washing the precipitate with spirit of wine, at proof, and drying in the shade, carmine of the richest and most lustrous hue, may be obtained even from samples of inferior quality.

Uses, &c. As a pigment in velvet and miniature painting, and for tinting artificial flowers, and as rouge for the complexion. The powdered cochineal (carmine grounds), from which the coloured liquor (liquid rouge, carmine liquor), has been decanted, is used by the paper stainers, and both are used in the preparation of carminated lake.

Blue Carmine. See INDIGO.

Liq'uid Carmine. *Syn.* FLUID CARMINE, LIQUID ROUGE, CARMINE INK. *Prep.* 1. A solution of carmine in ammonia water, or spirits of hartshorn. Very rich and beautiful.

2. The residual liquor of the process of making carmine. Inferior. The first is used in velvet and miniature painting, and for tinting artificial flowers; the second for common purposes, as a stain or wash.

Pur'ple Carmine. See MUREXIDE.

CARMIN'IC ACID. $C_{14}H_{14}O_8$. *Prep.* (W. De la Rue.) The powdered insect, after treatment with ether to remove the fat, is digested in water. The decoction of cochineal is precipitated by adding a solution of acetate of lead, and the impure carminate of lead thus formed, after being washed with water, is suspended in water, and decomposed by a stream of sulphuretted hydrogen; the whole process is repeated with the decanted solution, so obtained; the second solution is then evaporated to dryness (*in vacuo* over sulphuric acid), dissolved in absolute alcohol, digested on some washed crude carminate of lead (to separate a little phosphoric acid), and, lastly, mixed with ether (to precipitate some nitrogenised matter); the residuum obtained by careful evaporation (*in vacuo*) is pure carminic acid.

Prop., &c. A purple-brown mass, yielding a rich-red powder; it is freely soluble in water and alcohol; slightly soluble in ether; and without decomposition in oil of vitriol; it is feebly acid; its salts are termed carminates, only two or three of which have been examined. According to Mr. De la Rue, this acid constitutes the pure colouring matter of cochineal.

CAROT'INE. $C_{18}H_{24}O$. A crystalline, copper-red substance, obtained from the root of the *Daucus carota* (*sativa*) or garden carrot. It *is tasteless; odourless;* neutral; fusible; inflammable; insoluble in ether and water; slightly soluble in alcohol; and in the mixed and volatile oils.

CARPETS. Considerations o
and economy demand a few word
and hearth-rugs. We are assur
perienced person, that before p
sweep a carpet, a few handfuls o
leaves should be sprinkled over
five or six minutes before). A sti
or hair brush only should be em
the carpet be very dirty, when
carpet-broom may be used first,
another made of hair, to take
dust. The frequent use of a s
broom" (those made of cane or b
alluded to), soon wears off the b
best carpet. An ordinary clothe
clean one, resembling the dirt b
shoes, is best adapted for sup
When carpets are very dirty, th
cleaned by shaking and beatin
must have a carpet, take it up
times a year, instead of once. A
literally infects the room: if you
enormous quantity of organic
the feet of people coming in,
saturate it, this is by no means
(Miss Nightingale.) In laying d
it is very advisable, at first, t
floor beneath them with large sh
paper, so as to prevent dust
between the boards. Old drug
matting, or any similar substan
the same purpose, and will, m
terially increase the durability o
by preserving it from the contact
floor.

BRUSSELS CARPETS may be
ox-gall (1 pint to a pailful of
scrubbing-brush and floor-cloth
rinsing them in fresh water a
same way. They should be pr
fectly freed from dust by beatin
be nailed down before commenci
operations. Great care should
rub them as dry as possible wit
floor-cloth. A small portion on
done at a time, and a dry wind
for the purpose. A carpet tr
manner will be greatly refresh
particularly the greens.

KIDDERMINSTER CARPETS will
the above treatment without bec
as to get speedily dirty again.
some measure be prevented, by b
over with a hot weak solution of
to which a little alum has been
soap, dissolved in hot water,
instead of ox-gall, but it is n
injure the colours, if produced
When there are spots of greas
peting, they may be covered wi
dissolved in boiling water, and
brush until the stains are remov
must be cleaned with warm wa
The addition of a little gall to th

ious. Some persons employ a
, fuller's earth, and turpentine,
rpose. Benzol rapidly removes
ns, and may be advantageously
preparations of soap.

N. *Syn.* I″RISH MOSS; CHON′-
Chondrus crispus of botanists,
lga or seaweed. It contains a
m of a peculiar jelly, called
r pect′in. This may be puri-
on with dilute alcohol and fil-
jelly forms an agreeable article
used to a limited extent for
lours in calico printing. In
green is used in the form of a
ction as a demulcent, and is
ed in pulmonary complaints.
, PASTE, SYRUP.

Syn. CARO′TA, L. The seed is
d diuretic; the expressed juice
s anthelmintic. Scraped raw
times employed as a stimulant
sore nipples; the boiled root as
ores and tumours. As an article
young and well dressed, carrots
igestible.

IN. $C_{14}H_{16}O_7$. *Syn.* PURE
FLOWER CARMINE, SAFFLOWER
red colouring matter of *Cartha-*
us or safflower, formerly much
, particularly in the form of pink
eing stockings.

Safflower, exhausted by washing
r (or with water acidulated with
is dried, coarsely pulverised, and
igested in a weak solution of car-
ium; pieces of clean white cotton
then immersed in the solution,
cid gradually added in slight
cotton is next washed, dried, and
fresh quantity of dilute solution
of sodium, and agitation em-
the whole of the colour is again
he new solution is filtered and
r-saturated with citric acid (or
the carthamin, which falls down
nine-red flocks, is lastly washed
tilled water, and dried.

safflower (dried and powdered),
; aqueous solution of carbonate
ontaining 15% of carbonate), q. s.
k paste; after some hours press
liquor, nearly neutralise it with
ut in cotton as before, and add
n slight excess; the next day
tton and wash it in water holding
of carbonate of sodium, until the
lved out, after which precipitate
id, as before.

An amorphous, brilliant, green-
nearly insoluble in water, soluble
ing a gorgeous purple solution,
alkaline lyes, giving an equally
one.

[illegible]. *Syn.* SAF′FLOWER. *In bo-*
s of composite plants, the most important species of which is *Carthamus tinctorius*, the safflower. The florets of this yield a beautiful pink dye (see *above*), and are sometimes used to adulterate hay saffron. The "cake saffron" of the shops consists entirely of safflower and mucilage. The fruits, commonly called "seeds," yield by expression the useful oil known in India as Koosum oil.

CARUM (PTYCHOTIS) AJOWAN. Ind. Ph. *Syn.* AJWAIN or OMUM PLANT. *Habitat.* Tropical Africa? Much cultivated in India. —*Officinal part.* The fruit (*Fructus Ptychotis, Ajwain fruit*). Occurs in the form of minute umbelliferous fruits, which, examined with a lens, are seen to be covered with prominent tubercles, extremely aromatic, evolving, when rubbed, a strong odour resembling that of common thyme. Taste somewhat bitter, and very pungent. Its virtues reside in a volatile oil.—*Properties.* Valuable stimulant, carminative, and antispasmodic.—*Therapeutic uses.* In flatulence, flatulent colic, atonic dyspepsia, and diarrhœa, it is a remedy of much value.

OIL OF AJWAIN, or OMUM (*Oleum Ptychotis*). The oil obtained by distillation from the fruit. Recently prepared, colourless, but soon acquires a yellowish tinge. It has the odour of the fruit, and an acrid burning taste. Sp. gr. about 0·88.—*Dose.* 1 to 3 drops on sugar or in emulsion.

AJWAIN, or OMUM WATER (*Aqua Ptychotis*). Take of ajwain fruit, bruised, 20 oz.; water, 2 galls. Distil a gallon.—*Dose.* 1 to 2 fluid ounces. A valuable carminative; also useful in disguising the taste of disagreeable drugs, especially castor oil, and obviating their tendency to cause nausea and griping.

CARYOPH′YLLIN. $C_{10}H_{16}O$. *Syn.* CLOVE CAMPHOR, CLOVE RESIN. A crystalline substance, isomeric with ordinary camphor, which deposits from oil of cloves in needles.

CARYOPH′YLLUS." See CLOVE.

CASCARIL′LA. *Syn.* CASCARILLÆ CORTEX (B. P.), L. The bark of *Croton eleutheria* or the seaside balsam, a tree growing in the Bahamas and Jamaica. It is an aromatic bitter, stomachic, and tonic.—*Dose.* 10 grs. to 30 grs., in the form of powder, infusion, or tincture; in diarrhœa, dysentery, dyspepsia, low fevers, intermittents, &c.

CASCARIL′LINE. *Syn.* CASCARIL′LINA. *Prep.* (Duval.) Cascarilla is exhausted with cold water, by percolation, precipitated with acetate of lead, and the filtrate treated with sulphuretted hydrogen; the filtered liquid, after agitation with animal charcoal and filtration, is gently evaporated to dryness. The powder is redissolved in boiling alcohol and crystallised by very slow or by spontaneous evaporation. It has a bitter taste, and acid reaction; its aqueous solution is unaffected by the ferric salts and tincture of galls.—*Dose.* 1 to 3 *grs.; in* dyspepsia, &c.

CASE-HARD′ENING. *Syn.* STEEL SUR′FACING. *The* operation of giving a surface of steel to iron goods. Tools, fire-irons, fenders, keys, &c., are usually case-hardened.

Process. 1. The goods (finished in every respect but polishing) are put into an iron box, and covered with animal or vegetable charcoal, and "cemented" at a red heat, for a period varying with the size and description of the articles operated on; these, when taken out, are hardened by plunging into water, or oil, if they are of a delicate nature.

2. (Moxon.) Cow's horn or hoof is baked or thoroughly dried, and pulverised; to this is added an equal quantity of bay salt, and the whole is made into a paste with stale chamber-lye, or white wine vinegar; the iron is covered with this mixture, and bedded in it, in loam, or inclosed in an iron box. In this form it is laid on the hearth of the forge to dry and harden, then it is put into the fire, and blown till the lump has a blood-red heat (no higher). It is hardened as before.

3. Coat the goods with a paste made of a concentrated solution of prussiate of potash and loam; then expose them to a strong red heat, and when it has fallen to a dull red, plunge the whole into cold water.

4. The goods, previously polished and finished, are heated to a bright red and rubbed or sprinkled over with prussiate of potash. As soon as the prussiate appears to be decomposed and dissipated, the articles are plunged into cold water.

Obs. The process of case-hardening has been well conducted when the surface of the metal proves sufficiently hard to resist a file. The last two plans are a great improvement upon the common method. By the topical application of prussiate of potash (ferrocyanide of potassium) any part of a piece of iron may be case-hardened, without interfering with the rest.

Case-Hardening Powders. *Syn.* CASE-HARDENING COMPOSITIONS. 1. Prussiate of potash, dried and powdered.

2. Prussiate of potash, 3 parts; sal-ammoniac, 1 part; mix.

3. Sal-ammoniac and bone-dust, of each, 2 parts; prussiate of potash, 1 part. (See *above.*)

CA'SEIN. *Syn.* CA'SEUM, CA'SEIN, LACT-ALBU'MEN, ALBUMEN OF MILK. The nitrogenous principle of milk. Cheese made from skimmed milk and well pressed, is nearly pure caseine. (Liebig.)

Prep. 1. The curd obtained by adding dilute sulphuric acid to milk is well washed and dissolved in carbonate of soda. It is allowed to stand for 24 hours, to let the oil rise to the surface, and when this is properly skimmed off, the caseine is precipitated by an acid. The process is repeated a second time, and the coagulum digested with alcohol and ether, and dried. With all these precautions the caseine still contains some saline matter which cannot be removed.

2. *Milk is coagulated* by hydrochloric acid, and the curd then well washed wi
acid, and finally with pure water.
so prepared is dissolved by digestio
Fahr., with a large quantity of w
solution, after filtration, is coagul
carbonate of ammonia; the coagulum
with water, ether, and alcohol, a
dried.

Prop., &c. Coagulated caseine i
dissolved by the alkalies and alkali
ates. The most remarkable property
is its coagulation by certain animal m
as in the process of cheese-maki
rennet. See LACTARIN.

CASKS. The care and managemen
is an important affair in a large estab
It is found that they last longest wh
either in a dry situation, or in one
very moist. Continual variations
one to the other speedily rot them.
as casks are emptied they should b
down quite air-tight, with as much
they were full, by which means the
preserved both sweet and sound. S
of the hoops become loose, they sho
mediately driven up tight, which wi
prevent the liability of their being l
placed, as well as the casks fouling
ing musty from the admission of air.
purpose, those out of use should be
ally hauled over and examined.

Numerous plans are adopted for
and PURIFYING CASKS, among whic
following:—

1. Wash them well out with oil
diluted with an equal weight of wat

2. Wash them first with a little c
lime and warm water, and then w
soured with oil of vitriol.

3. Match them with sulphur, or
phur mixed with a little saltpetre.

4. Unhead them and whitewash
fresh milk of lime, made pretty stro
plan is commonly followed for brew

5. Remove the heads, and char t
of the staves by the aid of a fire of
kindled within them.

6. A simpler, safer, and more
method of charring them than the
wash the dry casks out with stro
vitriol (sp. gr. 1·854). This not on
the surface of the staves, but penet
all the cracks, some of which might
action of the fire.

7. Steam has lately been applied
sides of casks, with great advantag
pressure steam is driven in at the
at the same time that the cask is
agitated (a heavy chain having
viously put into it), until all the dir
smell is removed.

8. A lye of pearlash or soda, m
milk of lime, as well as strong hot
other similar liquors, have been ad
some persons, and are highly spoken

9. The coopers boil the staves for

re of alum before placing them
revent their colouring the spirit,
with oil of vitriol is a better

persons fill musty casks with
dd 3 or 4 lbs. of coarsely pow-
burnt charcoal, and agitate well
s.
ll the above processes the great-
; be taken to scald, or soak and
t the casks after the treatment de-
BREWING UTENSILS, MATCHES,

EP. The expressed juice of the
a, concentrated by heat and fla-
aromatics. It is used in the
as a condiment. (See *below.*)
A poisonous shrub cultivated in
dies, and in many parts of South
r the sake of the starchy matter
n its roots. It belongs to the
r *Euphorbiaceæ*, and is known to
der the names *Manihot utilissima*
ipha manihot (Humboldt), and
anihot (Linn.), the former being
nerally adopted. The name "bit-
is commonly given to it in the
, to distinguish it from another
e same genus, *Manihot aipi* (Pohl),
having no poisonous properties, is
"sweet cassava." The roots of
yield the starch, but those of the
nt are the richer.
, after being well washed and
rasped or grated, and the pulp
is subjected to strong pressure, to
oisonous juice which it contains.
sed pulp is next thoroughly dried
re, being constantly stirred the
by which any remaining portion
s juice is either volatilised or de-
It now forms CASSAVA MEAL.
further prepared by grinding, it
CASSAVA MEAL, or CASSAVA FLOUR.
ompressed pulp is baked on a hot
ms CASSAVA BREAD or CASSAVA
avour of which greatly resembles
h oat-cakes. See TAPIOCA.
In *botany*, a genus of the na-
Leguminosæ, including several im-
dicinal plants. The "purging
sia *fistula* (Linn.), produces pods
a soft, blackish pulp. (See *below*,
)
lp. *Syn.* CASSIA PRÆPARA'TA,
PA (B. P.), L. *Prep.* The cassia
it), broken lengthwise, are mace-
fficient distilled water to cover
ix hours, constantly stirring; and
l pulp strained through a hair
vaporated to the consistence of a
n a water bath.—*Dose.* As a mild
o 2 drs.; as a purgative, ½ oz. to

(Scented). See PASTILLES

CAS'TOR. *Syn.* CASTO′REUM, L. (B. P.). "The follicles of the prepuce of the *Castor fiber* or *beaver*, filled with a peculiar secretion." (Ph. L.) "A peculiar secretion from the præputial follicles." (Ph. E. and D.) It is often sophisticated; a fraud readily detected by the "absence of the membranous partition in the interior of the bags, as well as by the altered smell and taste." (Ure.) Russian castor, which is very rare, may be distinguished by a tincture of 1-16th part in alcohol, being of the colour of deep sherry, while that with American castor is of the colour of London porter. (Pereira.)—*Dose.* 1 to 2 drs. or more, in powder or made into pills; in nervous and spasmodic affections, especially in hysteria, epilepsy, and other like diseases of females.

CAS'TORIN. *Syn.* CASTORIN'A, CASTOREUM CAMPHOR. When castor is cut into small pieces and boiled in about 6 times its weight of alcohol, crystalline substance (*castorin*) is deposited by the filtered tincture in cooling. By re-solution in alcohol, it may be obtained under the form of colourless, prismatic, acicular crystals.

Obs. Genuine Russian castor, although the most expensive, must be employed in the above process, as scarcely any castorin can be obtained from the American variety.

Prop., &c. Castorin has the odour of castor, and a coppery taste; it is inflammable, and is soluble both in ether and hot alcohol.

CAS'TOR OIL. See OILS.

CASTS. In preparing casts and moulds with gelatin, wax, fusible metal, and similar substances, it is important to use them at the lowest temperature compatible with fluidity; as when only a few degrees hotter, the water which adheres to the things from which the casts are taken, is converted into vapour, and produces bubbles. Fusible metal may be allowed to cool in a teacup until just ready to set at the edges, and then poured into the moulds. In this way beautiful casts from moulds of wood, or of other similar substances, may be procured. When taking impressions from gems, seals, &c., the fused alloy should be placed on paper or pasteboard, and stirred about till it becomes pasty, from incipient cooling, at which moment the gem, die, or seal, should be suddenly stamped on it, and a very sharp impression will then be obtained.

CATALEP'SY. *Syn.* TRANCE; CATALEP'SIS, CATALEP'SIA, L. A disease in which the organs of sense and motion cease to exercise their functions, and the heart and lungs feebly perform their offices, and in a scarcely perceptible manner. The paroxysm generally comes on without previous warning, and its duration varies from a few minutes to several days, and if medical reports are to be credited, sometimes for a much longer period. Dr. Cullen seriously affirms that this disease is always counterfeited.

Treat. Ammoniacal stimulants applied to the nostrils, and spirituous liquors injected into the stomach, with general friction of the body, and free access to pure air, are the best remedies. Electricity and galvanism should also be had recourse to, when the necessary apparatus is at hand.

CAT'APLASMS. See POULTICES.

CAT'ARACT. An opaque condition of the lens of the eye. It is a common cause of blindness. It can only be cured by a surgical operation.

CATARRH'. *Syn.* CATARRH'US, L. The "cold in the head," or "cold on the chest," of domestic medicine. Influenza is a severer form of this complaint, and has been called epidemic catarrh.

The common symptoms of catarrh are a copious discharge from the eyes and nose; a hoarseness, and generally a cough, more or less severe. The exciting causes are sudden changes of temperature, and exposure to currents of cold air while the body is heated; hence the frequency of colds in hot and changeable weather.

Treat. A light diet should be adopted, and animal food and fermented and spirituous liquors should be particularly avoided. Some mild aperient should be administered; and when the symptoms are severe, or fever or headache is present, small diaphoretic doses of antimonials, accompanied by copious draughts of diluents, as barley water, weak tea, or gruel, should be taken. This treatment, except in very bad cases, will generally effect a cure.

CAT'ECHIN. *Syn.* CATECHU'IC ACID, RESINOUS TAN'NIN. When cubical gambir, or catechu, in powder, is treated with cold water, a portion remains undissolved. This is catechin. By repeated solutions in alcohol, it may be obtained under the form of white, silky, acicular crystals.

Prop., &c. Catechin strikes a green colour with the salts of iron, but does not precipitate gelatin. When dissolved in caustic potassa, and the solution exposed to the air, it absorbs oxygen, and japonic acid is formed. If, instead of caustic potassa, carbonate of potassa is employed, it is converted into rutic acid.

CAT'ECHU. *Syn.* CAS''HEW, CUTCH, GAM'BIR; CAT'ECHU (Ph. L. E. & D.), TER'RA JAPON'ICA, L.; CACHOU, Fr. "The extract from the wood of *Acacia Catechu*, or from the leaf of *Uncaria Gambir.*" (PALE CATECHU, Catechu Pallidum, B. P.) Also of the "kernels of *areca catechu*; probably, too, from other plants." (Ph. E.) The term is now applied to several extracts similar in appearance and properties to that of *Acacia Catechu.*

There are several varieties of catechu known in commerce, of which the principal are—

CATECHU, BOMBAY. Firm, brittle, dark brown, of a uniform texture, and a glossy, semi-resinous, and uneven fracture. Sp. gr. *1·39. Richness in tannin, 52%.*

CATECHU, BENGAL. Rusty br
ternally; porous, and more fri
preceding. Sp. gr. 1·28. Richn
49·5%.

CATECHU, MALABAR. Resemb
appearance, but is more brittl
Sp. gr. 1·40. Richness in tanni

Of the above varieties the fi
generally employed in medici
commonly passes by the name of
second popularly passes under
terra Japonica (Japan earth),
belief that it was of mineral orig

CATECHU, PALE, is prepared
and in the Eastern Archipelago.
occurs in cubical reddish-brown
bitter, and astringent in tas
soluble in boiling water; the s
cold, is not rendered blue by iod
parts, only 60 are dissolved by c
the solution is bright. Thirty
glass precipitate the whole of t
matter.—*Test.* Sp. gr. 1·39.
catechu being already in the Ed
1864, retained it with the black;
is the one adopted by all other ph
and is preferred in the arts and m
it is well known to be far
the pale in astringency, and i
be had of good quality; it is
matter of surprise and regret th
rejected from the 'British Pha
(Squire.)

Estim. It is often of impo
tanner and dyer to determine th
this article in tannic acid or t
following are two simple methods

1. Exhaust a weighed sample
with ether, and evaporate by the
water bath. The product, which
must then be accurately weighed.

2. Dissolve the sample (in po
water, let it cool out of contact
filter, and add a solution of gelat
a precipitate falls. The precipitat
washed and dried at a steam
40% of tannin.

Uses, &c. Catechu is extensiv
in medicine, both internally and
an astringent. It is used to fl
brandy, and by the tanners as a
oak bark. With it the dyer pr
pensively, many of his most plea
Alum mordants are mostly emplo
with catechu. "The salts of co
ammoniac cause it to give a BRO
which is very fast; the proto-ch
a BROWNISH YELLOW; the per-c
with the addition of nitrate of co
BRONZE HUE; acetate of alum
REDDISH BROWN, and with nitra
A REDDISH-OLIVE GRAY; nitrat
DARK-BROWN GRAY. For dyein
COFFEE-BROWN, it has entirel
madder; 1 lb. of it being equiva
of this root." (Ure.)—Dose. 10

water, or made into a bolus, or
enge.

The prepared and twisted in-
.mals. *Prep.* The guts, taken
rom the animal, are thoroughly
from adherent fat, and well
e water. They are next soaked
ays in water, after which they
able and scraped with a copper-
a semicircular notch, beginning
at the smaller end. In this way
and peritoneal membranes are
e guts are then put into fresh
aked until the next day, when
is scraped; the larger ends cut
well washing, again steeped for
esh water, and then for 2 or 3
ak lye of pearlash or potash (2
al.). They are lastly washed in
and passed through a polished
s of brass to smooth and equalise
; after which they are twisted,
according to the purposes for
e intended. For many purposes
l gut is dyed or sulphured, and
olive oil. It improves by age.
ink, or any of the simple dyes or
ed to colour it.

Catgut is employed in several of
he strings of harps, violins, &c.,
of this material. Whipcord is
catgut, which is sewed together
ith the filandre or scrapings, after
put into a frame and twisted.
for hatmakers are made out of the
tines, 4 to 12 of which are twisted
til the cord is extended to 15 to
ngth. It is then rubbed perfectly
l free from knots, half dried, sul-
e, again stretched and sulphured,
ried in a state of tension. Clock-
ds are made of the smallest intes-
imilar manner.

fine catgut is made at Venice or
a the intestines of thin, sinewy
at made in England is formed from
p killed for the shambles, and is,
rior. Coarse catgut, for turning
is made from the intestines of
into 4 or 5 strips, by forcing a ball
ith projecting knives placed cross-
them. These strips are next
ed, and rubbed smooth with fish
ta percha and vulcanized India
now applied to many of the pur-
rly exclusively occupied by cat-

TICS. See PURGATIVES.

TIN. The purgative principle of
noticed by Lassaigne and Fenuelle.
aeous infusion of senna leaves is
to the consistence of a syrup, out
with the air; this fluid extract is
d in alcohol or rectified spirit, and
a, after filtration, is evaporated to
a gentle heat.

Prop., &c. A reddish-coloured, uncrystallisable mass; having a peculiar odour, and a bitter, nauseous taste; freely soluble in both water and alcohol, and strongly cathartic. Two or three grs. cause nausea, griping, and purging. It has been proposed to employ it, combined with aromatics, as a cathartic.

CATH'ETERS. Small tubes introduced into the bladder for the purpose of drawing off its contents. They may be regarded as hollow bougies.

Prep. 1. A piece of smooth catgut, or steel wire, bent to the proper shape, is coated with melted wax. When cold, it is dipped repeatedly into an ethereal solution of India rubber, until a sufficient thickness is obtained, after which it is dried by a gentle heat, and then boiled in water to melt out the wax, and to allow the catgut to be withdrawn. A solution of India rubber in bisulphide of carbon is now generally employed instead of an ethereal solution.

2. From slips of India rubber, as directed under BOUGIES.

3. A smooth tissue of silk is woven over a bent wire, and then coated with a surface of India rubber, or elastic varnish, and finished off as before. See BOUGIES.

CAU'DLE. Gruel enriched by various additions.

Prep. 1. Thick oatmeal gruel mixed with about one half its weight of good mild ale (made hot), and as much sugar, and mace, nutmeg, or ginger, as will make it agreeable.

2. To the last add an egg, well beaten.

3. Sugar, 3 or 4 lumps; hot water, a tablespoonful; dissolve; add 1 egg; beat well together; further add a glass of wine and a little nutmeg or ginger; mix well, and stir the mixture into good gruel (hot), ¾ pint.

Uses, &c. A nourishing and restorative mixture during convalescence, much used among certain classes after accouchement. It is an excellent domestic remedy for colds, &c., unaccompanied with fever; for which purpose it should be taken on retiring to rest at night, preceded by a dose of castor oil during the day.

CAUS'TIC. *Syn.* CAUS'TICUM, ESCHAROT'ICUM, L. A substance that corrodes or destroys the texture of organised bodies. This action is popularly termed "burning."

The principal caustics are nitrate of silver, caustic potassa, a mixture of caustic potassa and quick-lime, sulphate of copper, red oxide of mercury, verdigris, tincture of sesquichloride of iron, chloride of zinc, chloride of antimony, nitric acid, acetic acid, and carbolic acid.

Use. Caustics are employed to remove excrescences, morbid growths, granulations, &c., as corns, warts, and proud flesh; and to open issues, abscesses, &c. The first, second, and fourth are applied by gently rubbing them on the part previously moistened with water; the third is commonly made into a paste, with two small bits of gum galbanum or ammoniacum, which must be rubbed or ground till they are dissolved. Then mix the whole with a sufficient heat. Keep the glue in a phial closely stopped, and when it is to be used set the phial in boiling water.

2. (Keller's ARMENIAN CEMENT.) Soak isinglass, ½ oz., in water, 4 oz., for 24 hours; evaporate in a water bath to 2 oz.; add rectified spirit, 2 oz., and strain through linen; mix this, whilst warm, with a solution formed by dissolving gum mastic (best), ¼ oz., in rectified spirit, 2 oz.; add of powdered gum ammoniac 1 dr., and triturate together until perfectly incorporated, avoiding loss of the spirit by evaporation as much as possible.

3. (Uure's DIAMOND CEMENT.) Isinglass, 1 oz.; distilled water, 6 oz.; boil to 3 oz., and add rectified spirit, 1½ oz.; boil for a minute or two, strain, and add, while hot, first a milky emulsion of ammoniac, ½ oz., and then tincture of mastic, 5 drs.

4. Isinglass soaked in water and dissolved in spirit, 2 oz. (thick); dissolve in this 10 grs. of very pale gum ammoniac (in tears), by rubbing them together; then add 6 large tears of gum mastic, dissolved in the least possible quantity of rectified spirit.

5. Isinglass dissolved in proof spirit (as *above*), 3 oz.; bottoms of mastic varnish (thick, but clear), 1½ oz.; mix well.

Obs. When carefully made, this cement resists moisture and dries colourless. As usually met with, it is not only of very bad quality, but sold at exorbitant prices. "Some persons have sold a composition under the name of Armenian cement in England; but this composition is badly made; it is much too thin, and the quantity of mastic is much too small." (Eton.) Methylated spirit may be used instead of the pure spirit in the above preparations. Mastic and mastic varnish are also used by jewellers as cements.

Cement, Beale's. Chalk, 60 parts; lime and salt, of each, 20 parts; Barnsey sand, 10 parts; iron filings or dust, and blue or red clay, of each, 5 parts; grind together and calcine. Patented as a fire-proof cement.

Cement, Boil'er. *Prep.* Dried clay in powder, 6 lbs.; iron filings, 1 lb. Make into a paste with boiled linseed oil. *Used* to stop cracks and leaks in iron boilers, stoves, &c. See IRON CEMENT, STEAM-BOILER C.

Cement, Bot'any Bay. Yellow gum (Botany Bay gum) and brickdust, equal parts, melted together. *Used* to cement coarse earthenware, &c.

Cement, Bot'tle. *Prep.* 1. Resin, 1 lb.; tallow or suet, ¼ lb.; melt together, and stir in the colouring matter.

2. Resin, 5 lbs.; bees' wax, 1 lb.; colouring, q. s.; as last.

3. (Red.) To each pound of the above add whiting (dry), 3 oz., and light red (burnt ochre), 4 oz.; or red bole, q. s.; (all in fine powder).

4. (Black.)—*a.* To each pound of
No. 2, add ivory black (bone black),
b. From black pitch, 6 lbs.; ivory
whiting, of each, 1 lb.; melted
Used in the same way as common
for bottle corks, cask bungs, &c.
SIAT'S CEMENT.

Cement, Brim'stone. Melted brimsto
alone, or mixed with resin and
Cheap and useful.

Cement, Bru'yere's. Clay, 3 parts
lime, 1 part; mix and expose them
red heat for 3 hours, then grind to
Recommended as an hydraulic cement

Cement, Build'ing. *Syn.* ARTIFICIA
LENE'. From a mixture of clay
broken pottery, flints, or siliceous
broken bottle glass, and wood ashes,
a considerable heat in a furnace,
comes partially vitrified; it is then
fine powder, sifted, and mixed with
its weight of quick-lime, also in fine
after which it must be packed (tight)
to preserve it from the air and moist
use it is mixed up with water and
Roman cement.

Cement, Cap. *Prep.* 1. Resin, 5 lbs
wax and dried Venetian red, of each,
melted together.

2. (C. G. Williams.) Equal weigh
lead and white lead. *Used* for che
electrical purposes. For cementing gla
necks of balloons, &c., into metal
ings. No. 2 is preferable to white le
and may be depended on for tempera
to 212°.

Cement, Cheese. From grated che
parts; quick-lime (in fine powder),
white of egg, q. s.; beat to a paste.
earthenware, &c.

Cement, Chem'ical. *Syn.* SOFT C
Prep. From yellow wax, 4 parts;
turpentine, 2 parts; Venetian red (well
1 part; melted together. *Used* as a
rary stopping or lute for the ends or
tubes, which are not exposed to much
as in alkalimetry, &c. See ELECTRIC
MENT.

Cement, Chi'nese. *Syn.* SHELL-LAC C
LIQUID GLUE. *Prep.* 1. Finest pale
shell-lac (broken small), 4 oz.;
spirit (strongest), 3 oz.; digested
in a corked bottle in a warm place
solved. Very strong and useful; almost
less. It should have about the consist
treacle.

2. As before, but using rectified
naphtha as the solvent. Inferior to th
but excellent for many purposes.

3. (Without spirit.) *Prep.* Borax,
water, ¾ pint; shell-lac, 3 oz.; boil in
vered vessel until dissolved, then evapo
a proper consistence. Cheap and use
dries slowly.

Uses, &c. Employed to mend glass,
fancy work, jewelry, &c., for which it i

rmenian cement. The first for-
es a cement so strong that pieces
y be joined together, cut slopingly
rain, and will afterwards resist
ot to break them at the same place.
the islands of the Indian Ocean,
ina, and the East Indies, a similar
ased to join pieces of wood for
, &c. The fluid is thinly smeared
ace of the joint, a piece of very
nterposed, and the whole pressed
ther and maintained so until the
Joints so made will even bear the
xure of a bow without separating.
bly adapted for fishing rods. The
the second formula is commonly
D GLUE. That of the last is much
druggists and oilmen, instead of
ing paper labels to tin, and to glass
ed to damp.

Cop'persmiths'. *Syn.* BLOOD CE-
m bullock's blood thickened with
ered quick-lime. *Used* to secure the
rivets of copper boilers, to mend
joints, &c. It must be used as soon
s it rapidly gets hard. It is cheap
e, and is suited for many other pur-

Curd. *Prep.* 1. The curd of skimmed
ined by the addition of vinegar or
beaten to a paste with quick-lime, in
r.

vinegar, ½ pint, to skimmed milk, ½
the curd with the whites of 5 eggs;
m and powdered quick-lime, q. s. to
aste. *Used* for mending glass and
are; they resist water and a moderate
heat.

, Cut'lers'. *Prep.* 1. Black resin,
ees' wax, 1 lb.; melt, and add finely
and well-dried brickdust, 1 lb.; mix

al weights of resin and brickdust,
gether.
o fix knives and forks in their handles.
t into the hollow of the handle, and
l, previously made hot enough to
composition, pressed into its place
rm, and the whole kept upright and
l quite cold.

t, Di'amond. See ARMENIAN CE-

t, Egg. White of egg thickened with
wdered quick-lime. *Used* to mend
are, glass, china, marble, alabaster,
aments, &c. It does not resist long
to moisture, unless it has been ex-
heat.

t, Elas'tic. *Prep.* 1. Caoutchouc (in
ces), 1 part; chloroform, 3 parts;

her.) Caoutchouc, 5 parts; chloro-
arts; dissolve, and add gum mastic
d), 1 part. Elastic and transpa-

ta percha, 8 parts; caoutchouc, 1 part (both cut small); bisulphide of carbon, 8 parts; mix in a close vessel and dissolve by the heat of a water bath. This is to be gently warmed before it is applied.

4. Gutta percha, 1 lb.; caoutchouc, 4 oz.; pitch, 2 oz.; shell-lac, 1 oz.; linseed oil, 2 oz.; melted together. This must be melted before being applied.

Obs. The cements 1 and 2 are elastic and transparent, and are applicable to many uses. The others, 3 and 4, are used for uniting leather, cloth, &c.

Cement, Elec'trical. *Syn.* CHEMICAL CEMENT. From black resin, 7 lbs.; red ochre, 1 lb.; plaster of Paris, ¼ lb.; (both well-dried and still warm); melted together, and the heat and agitation continued until all frothing ceases, and the liquid runs smooth; the vessel is then withdrawn from the fire, and the mixture stirred until cooled sufficiently. *Used* to cement the plates in galvanic troughs, join chemical vessels, &c. See CAP CEMENT, SINGER'S CEMENT, &c.

Cement, Engineers'. *Prep.* 1. Ground white lead, mixed with as much red lead as will make it of the consistence of putty.

2. Equal weights of red lead and white lead, mixed with boiled linseed oil to a proper consistence. *Used* by engineers and others to make metallic joints. A washer of hemp, yarn, or canvas, smeared with the cement, is placed in the joint, which is then "brought home," or screwed up tight. It dries as hard as stone. It also answers well for joining broken stones, however large. Cisterns built of square stones, put together, while dry, with this cement, will never leak or come to repair.

Cement, Extempora"neous. 1. Shell-lac, melted and run into small sticks the size of a quill. *Used* to join glass, earthenware, &c. The edges are heated sufficiently hot to melt the cement, which is then thinly smeared over them, and the joint made while they are still hot. This is the cement so commonly vended in the streets of London, and which used to surprise us in our boyhood days.

2. Tears of gum mastic, used in the same way. Commonly employed by jewellers and others.

Cement, Fire'proof. *Prep.* From fine river sand, 20 parts; litharge, 2 parts; quick-lime, 1 part; linseed oil, q. s. to form a thin paste. Applied to walls, it soon acquires a stony hardness. It is also used to mend broken pieces of stone, stone steps, &c. See BEALE'S CEMENT, &c.

Cement, Flour. *Syn.* PASTE, FLOUR PASTE. This useful and well-known article is made by mixing about a tablespoonful of wheat flour with cold water, (say) ½ pint, adding the latter gradually, and thoroughly stirring in each portion before pouring in more; the vessel is then placed over the fire, and the whole assiduously stirred until it boils, great care being taken to prevent caking on the bottom, or burning. Some persons add about ⅓rd of a teaspoonful of powdered alum to the water, which is said to strengthen the product; the shoemakers add a little quantity of powdered resin to the flour, with the same intention. The addition of a little brown sugar and a few grains of corrosive sublimate will prevent it turning mouldy, and is said to preserve it for years. When too hard or dry, it may be softened by beating it up with a little hot water.

Cement, French. Mucilage of gum arabic, thickened with starch powder or farina; a little lemon-juice is sometimes added. *Used* by naturalists in mounting specimens; by artificial-flower makers; and by confectioners, to stick paper, wafer papers, ornaments, &c., on their fancy cakes. Plain mucilage is often used in the same way.

Cement, Gad's. *Syn.* GAD'S HYDRAULIC CEMENT. From clay (well dried and powdered), 3 parts; oxide of iron, 1 part; mixed together, and made into a stiff paste with boiled oil. *Used* for work required to harden under water.

Cement, Glass. *Syn.* GLASS FLUX. *Prep.* Red lead, 3 parts; fine white sand, 2 parts; crystallised boracic acid, 3 parts; mixed and fused; it is levigated, and applied with thin mucilage of tragacanth. *Used* for mending broken china, &c. The repaired article must be gently heated, so as partially to fuse the cement.

Cement, Gibbs'. Mr. Gibbs patented in 1850 various processes for making admirable building and architectural cements, equal in hardness and duration, and superior in colour, to the best Roman and Portland cements at present in use. His materials are obtained from "the vast beds of (natural) argillaceous marls and marly limestones, or marl stones, which contain the due admixture of lime, silica, and alumina, from which hydraulic cements and artificial stones may be manufactured." These materials he finds in "the chalk formation, the Wealden formation, the Purbeck beds, the lias formation, the mountain limestone, and the lowest strata of the coal-measures." After duly choosing his materials according to the particular object in view, he prepares them "by burning in kilns, and grinding in mills, in the way cement is now manufactured." Marls and limestones are to be "first dried in kilns or ovens, at a heat fit for baking, until all moisture be driven off, and that then the calcination be prolonged as much as possible; the heat being kept as low as is only just sufficient to effect complete calcination—this being indispensable, to avoid the commencement of vitrification, which would destroy the adhesive properties of the cement."

Cement, Glue. *Prep.* 1. From glue, 1 lb., melted with the least possible quantity of water, and then mixed with black resin, 1 lb., and red ochre, 4 oz.

2. Glue, melted as above, and mixed with about ¼th of its weight each of boiled red ochre.

3. (Ure.) Melted glue (of the used by carpenters), 8 parts; linseed to varnish with litharge, 4 parts; thoroughly together.

4. Glue (melted as last), 4 parts; turpentine, 1 part.

Obs. The first three dry in about and are very useful to render the wooden casks, cisterns, &c., to fix stones in frames. The last cement glass, wood, and even metal other. They all resist moisture well.

Cement, Grind'ers'. *Prep.* 1. From 5 parts; wood ashes and hard tallow, 1 part; melted together.

2. Black resin, 4 lbs.; bees' wax, melt, and add of whiting (previously red hot, and still warm), 1 lb.

3. Shell-lac, melted and applied to the slightly heated. *Used* to fix pieces &c., whilst grinding. The last is lenses and fine work.

Cement, Ham'elin's. *Syn.* HAMELIN'S TIC. From siliceous sand, 60 parts; Portland stone (in fine powder), 40 lime-marl, 20 parts; litharge, 8 parts; together. For use, it is mixed up with oil and used like mortar. When this is applied to the purpose of covering ings intended to resemble stone, the of the building is first washed with oil.

Cement, Hens'ler's. Litharge, quick-lime, 2 parts; white bole, 1 part; fine powder); linseed-oil varnish, q. s. a paste. *Used* for china, glass, &c. It tenacious, but long in drying.

Cement, Hœ'nle's. Shell-lac, 2 parts; turpentine, 1 part; fused together, and into sticks. It is used like cement for glass and earthenware.

Cement, Hydrau'lic. Hydraulic cements are those which set or under water. Common lime does not this property; but limestones containing 8% to 25% of alumina, magnesia, and yield a lime on burning, which does when moistened with water, but mortar with it, which hardens in a when covered with water, although it acquire much solidity in the air. septaria, and argillaceous or siliceous burnt, either with or without the common limestone, and then ground der, form excellent hydraulic cements reniform limestone, commonly called " stone," which is found distributed in nodules or lenticular cakes, in beds of the substance most commonly used country for the manufacture of the in question. See GAD'S, HAMELIN'S, PARKER'S CEMENTS, &c.

Cement, Iron. This cement, which is used for closing the joints of iron

:s, is formed of the borings or
st iron, which should be clean
rust, mixed with a small quan-
moniac and flowers of sulphur.
irred up with just enough water
moisten it, and it is rammed or
e joints with a blunt caulking
mmer, after which the joint is
its bolts as tightly as possible.
s and borings are very coarse,
n by pounding in an iron mor-
lust sifted off before use. The
ood proportions:—
oniac (in powder), 2 oz.; flowers
z.; iron borings, 5 lbs.; water,

oniac, 2 oz.; sulphur, 1 oz.; iron
s.; water, q. s. to mix.
oniac, 2 oz.; iron borings, 7 or
q. s. to mix.
ngs, 4 lbs.; good pipeclay, 2 lbs.;
herds, 1 lb.; make them into a
t and water.
The first of these forms is that
loyed for common purposes, but
more sulphur and sal-ammoniac
Ve are told by one of the leading
ondon, that the strongest cement
ut sulphur, and with only 1 or
ammoniac, to 100 of iron borings
form); but that when the work
dry rapidly, as for the steam
chinery wanted in haste, the
l-ammoniac is increased a little,
all quantity of sulphur is added.
makes it set quicker, but reduces
As the power of the cement
the oxidisation and consequent
the mass, it is evident that the
matter introduced the better. No
cement should be made at a time
used at once, because it soon
ve seen it become quite hot by
n a few hours, when it contained
l I have been informed by work-
en much sulphur is used, and it
t together in quantity all night,
has taken place. The last form
cement that gets very hard when
dry slowly, and is excellent for
rks in iron boilers, tanks, &c.
panese'. *Syn.* RICE GLUE. From
ixed with a little cold water, and
r gradually poured in until it ac-
er consistence; when it is boiled
minutes in a clean saucepan or
in. It is beautifully white, and
parent, for which reason it is well
ancy paper work, which requires
colourless cement. It is superior
ment. (See *antè*.)
ene's Mar'ble. Baked gypsum or
ris, steeped in a saturated solu-
and then recalcined, and reduced
For use, it is *mixed up with water,*
laster of Paris.

Obs. This cement has been most extensively applied as a stucco. It is susceptible of a high polish, and when coloured, produces beautiful imitations of mosaic, and other inlaid marbles, scagliola, &c. It is not adapted to hydraulic purposes, or for exposure to the weather, but it is admirable for internal decorations, and from its extreme hardness is very durable. It may be coloured or tinted of any shade, by diffusing mineral colours (levigated, if in powder) through the water used to mix up the cement with. A pleasing tint is given to this cement by adding a little solution of green copperas to the alum liquor.

Cement, Lab'oratory. *Syn.* CHEMICAL MASTIC. From equal parts of pitch, resin, and plaster of Paris (thoroughly dried), mixed together. *Used* for the masonry of chlorine chambers, vitriol works, &c.; and as a lining for casks intended to hold chloride of lime.

Cement, Let'ter-fix'ing. *Prep.* Copal varnish, 15 parts; drying oil, 5 parts; turpentine, 3 parts; oil of turpentine, 2 parts; liquefied glue (made with the least possible quantity of water), 5 parts; melt togethr in a water bath, and add fresh slaked lime (perfectly dry, and in very fine powder), 10 parts. *Used* to attach metal letters to plate glass in shop windows, &c.

Cement, Mahog'any. *Prep.* 1. Melt bees' wax, 4 oz.; then add Indian red, 1 oz., and enough yellow ochre to produce the required tint.

2. Shell-lac, melted and coloured as above. Very hard. Both are used to fill up holes and cracks in mahogany furniture by the cabinet makers. Red putty is also used for the same purpose.

Cement, Mais'siat's. India rubber is melted, either with or without about 15% of either bees' wax or tallow; quick-lime (in fine powder) is gradually added; and the heat continued, until change of odour shows that combination has taken place, and until a proper consistence is obtained. *Used* as a waterproof and air-tight covering for corks, bungs, &c.

Cement, Mar'ine. See MARINE GLUE and ELASTIC CEMENT.

Cement, Opti"cians'. *Prep.* 1. Shell-lac softened with rectified spirit or wood naphtha. For fine work.

2. Bees' wax, 1 oz.; resin, 15 oz.; melt, and add, whiting (previously made red hot, and still warm), 4 oz.

3. Resin, 1 lb.; melt and add plaster of Paris (dry), 4 oz. The above are used to fix glasses, stones, &c., while polishing and cutting them. The last is a very strong cement for rough purposes.

Cement, Oxychlo"ride of Zinc. (Sorel.) *Prep.* In solution of chloride of zinc, marking from 50° to 60° of Baumé's hydrometer (*i.e.* sp. gr. 1·490 to 1·652), dissolve 3% of borax or sal-ammoniac; then add oxide of zinc, which has *been heated to redness,* until the mass is of a *proper consistence.*

weight of new dry quick-lime, also in very fine powder, and to every ounce of the mixture add 5 or 6 grs. of powdered camphor; triturate the whole well together, and keep it in wide-mouth 1-oz. phials, well corked. *Used* to join glass, earthenware, &c. It is made into a paste with a little water, as wanted, and applied immediately.

Cement, Park'er's. This cement is made of the nodules of indurated and slightly ferruginous marl, called by mineralogists "septaria," and also of some other species of argillaceous limestone. These are burnt in conical kilns, with pit coal, in a similar way to other limestone, care being taken to avoid the use of too much heat, as if the pieces undergo the slightest degree of fusion, even on the surface, they will be unfit to form the cement. After being properly roasted, the calx is reduced to a very fine powder by grinding, and immediately packed in barrels, to keep it from the air and moisture.

Uses, &c. This cement is tempered with water, and applied at once, as it soon hardens, and will not bear being again softened down with water. For foundations and cornices exposed to the weather, it is usually mixed with an equal quantity of clean angular sand; for use as a common mortar, with about twice as much sand; for coating walls exposed to cold and wet, the common proportions are 3 of sand to 2 of cement, and for walls exposed to extreme dryness or heat, about 2½ or 3 of sand to 1 of cement; for facing cistern work, water frontages, &c., nothing but cement and water should be employed. Under the name of compo' or Roman cement, it is much employed for facing houses, water-cisterns, setting the foundations of large edifices, &c.

of the lias formation, or from
found in the upper division of the
tion, or in the shale beds of the
clay. It is also prepared from seve
mixtures of ferruginous clay and li
together. It must be kept in close
mixed with water when used. See
and GIBBS' CEMENT.

Cement, Seal Engra"vers'. Resem
ers' cement. *Used* to fix the piec
while cutting, and also to secur
tools in their handles. It grows
improves every time it is melted.

Cement, Sin'ger's. *Prep.* 1. M
resin, 5 lbs., and bees' wax, 1 lb.,
finely powdered red ochre (highly
still warm), 1 lb., and plaster of
continuing the heat a little above
and stirring constantly till all frot

2. Resin, 6 lbs.; dried red-ochre,
cined plaster of Paris, ½ lb.; linsee
Used to cement the plates in volt
to join chemical vessels, &c. No. 2
applicable to troughs. See ELEC
MENT.

Cement, Steam-boiler. *Prep.* L
fine powder, 2 parts; very fine sand
lime (that has been allowed to
taneously in a damp place), of ea
mix, and keep it from the air. *U*
the cracks in boilers and ovens, a
steam joints. It is made into a
boiled oil before application.

Cement, Steam-pipe. *Prep.* Goo
varnish is ground with equal weig
lead, oxide of manganese, and pipe

Cement, Transpar'ent. See ELAST

Cement, Turn'ers'. *Prep.* Bees'
resin, ¼ oz.; pitch, ¼ oz.; melt,

e thrown into water rapidly

m sand, 1 cwt.; quick-lime, in
s.; bone ashes, 14 lbs. The
it up with water for use. See
EMENT, &c.

a'terproof. Several compounds
ave been already noticed. The
'aterproof cement of Dihl" con-
lain clay or pipeclay, dried by a
nd powdered, mixed up to the
f a paste with boiled linseed oil,
s, a little oil of turpentine. It
y adding a little red or yellow
similar pigment. It is used to
its of buildings, roofs of veran-

remarks. For mending broken
HENWARE, GLASS, and WOOD,
ions generally used are the ce-
ed above as ARMENIAN, BOTANY,
, CHINESE, CURD, EGG, EXTEM-
GLASS, GLUE, HENSLER'S, HŒ-
GANY, and PARABOLIC. For SPAR,
similar materials, the ALABASTER
pecially adapted; the EGG and
CEMENTS will, however, answer
purpose. For CLOTH, LEATHER,
D, and LIGHT FANCY WORK, the
ble cements are the ELASTIC,
FLOUR, FRENCH, and JAPANESE.
ts adapted for CHEMICAL and
APPARATUS, and for SEALING
e those termed BOTTLE, BRIM-
, CHEMICAL, ELECTRICAL, LABO-
IASSIAT'S, and VARLEY'S. The
and HYDRAULIC CEMENTS are
der the heads ARCHITECTURAL,
BRUYERE'S, FIREPROOF, GAD'S,
MELIN'S, HYDRAULIC, KEENE'S,
DE, PARKER'S, PEW'S, PORTLAND,
TER, and WATERPROOF. The ce-
for METAL-WORK, &c., in different
oticed under the heads COPPER-
TLERS', ENGINEERS', GRINDERS',
ER-FIXING, OPTICIANS', PLUMB-
-ENGRAVERS', STEAM-BOILER,
and TURNERS'. See GLUE, LUTE,
OTH-CEMENT, &c.

'TION. The process of imbedding
in, or covering it with, some
mposition capable of acting on it
, and in this state exposing it to
Iron is converted into steel, and
éaumur's porcelain, by cementa-

IN. *Syn.* CENTAURIN'A. The
tive matter of *Erythæa centau-*
mon centaury. Combined with
acid, it has been highly recom-
febrifuge.

. *Syn.* PRUN'INE. The insoluble
berry-tree gum. It is identical
. Dr. John applies the term to
es which, like *tragacanth, swell,*
solve in water. See BASSORIN.

CE'RATE. *Syn.* CERA'TUM, L. A thick species of ointment containing wax. Cerates are intermediate in consistence between ointments and plasters; but are less frequently employed than either of those preparations. The medicinal ingredients which enter into the cerates are very numerous; indeed, almost every kind of medicine capable of exercising a topical effect may be prescribed in this form.

It is a general custom with the druggists to use a less quantity of wax for their cerates than that which is necessary to give them a proper consistence, and in many cases it is omitted altogether, and its place supplied by hard suet or stearine, and frequently by common resin. Lard is also very generally substituted for olive oil. Indeed, in no class of pharmaceutical preparations are the instructions of practitioners and the colleges more commonly disregarded. The operation of melting the ingredients should be performed in a water bath or steam bath, and the liquid mass should be assiduously stirred until cold.

All the medicated cerates may be prepared by adding the active ingredients, in the form of fine powder, soft extract, solution, &c., as the case may be, to either simple cerate or spermaceti cerate, in the proportions indicated under the head of "Doses" appended to every article of importance noticed in this work. The mixture, which must be complete, may be effected by working the articles together on a marble or glass slab or tile, or, still better, by trituration in a clean wedgwood mortar. In some cases the simple cerate is melted by a gentle heat, and the whole stirred or triturated until nearly solid; in others, digestion with heat is employed.

Cerate. *Syn.* SIM'PLE CERATE, SIMPLE DRES'SING; CERATUM (Ph. L.), C. SIM'PLEX (Ph. L. 1824). *Prep.* (Ph. L.) Yellow wax, 20 oz.; melt by a gentle heat; add olive oil, 1 pint; and stir until it begins to solidify.

Used as a simple emollient dressing. The corresponding preparations of the other colleges will be found noticed under OINTMENTS. The *ceratum simplex* of the Ph. E. is SPERMACETI CERATE.

Cerate, Ac'etate of Lead. *Syn.* CE'RATE OF SUGAR OF LEAD; CERA'TUM PLUM'BI ACETA'TIS (Ph. L.), L. *Prep.* (Ph. L.) White wax, 5 oz.; olive oil, 18 fl. oz.; melt together; add, acetate of lead (in fine powder), 5 drs., previously triturated with olive oil, 2 fl. oz., and stir till they unite (begin to solidify). *Used* as a cooling dressing to burns, excoriations, and inflamed sores.

Cerate, Ammoni'acal. *Syn.* CERA'TUM AMMONIACA'LE, L. *Prep.* (Rechoux.) Simple cerate, 1 oz.; carbonate of ammonia, 1 dr.; mix. As a counter-irritant in croup, &c.

Cerate, Arsen'ical. *Syn.* CERA'TUM ARSEN'ICI, C. A'CIDI ARSENIO'SI, L. *Prep.* 1. (Ph. U. S.) Arsenious acid (in very fine powder), *20 grs.; simple cerate,* 1 oz.

2. (Sir A. Cooper.) Arsenious acid and to indolent tumours.

2. (Compound; C. B. COMPOS'ITUM, L.) *Prep.* (W. Cooley.) Belladonna cerate, 1 oz.; iodide of gold, 12 grs.; carefully triturated together. *Used* as a friction to scrofulous and syphilitic tumours, and to remove syphilitic and rheumatic pains. A most active and excellent preparation.

Cerate, Brown. See PLASTERS.

Cerate, Caca'o. *Syn.* CACA'O POMMADE. *Prep.* Butter of cacao, white wax, and oil of almonds, equal parts, melted together and strained. *Used* as a cosmetic for chapped hands and lips, &c.

Cerate, Cal'amine. *Syn.* TURNER'S CERATE, HEALING SALVE; CERATUM CALAMI'NÆ (Ph. L. & E.), C. LA'PIS CALAMINA'RIS (Ph. L. 1788), L. *Prep.* 1. (Ph. L.) Yellow wax, 7½ oz.; olive oil, 1 pint; melt together, remove the vessel from the fire, and when they first begin to thicken, add prepared calamine, 7½ oz., and stir constantly until they cool.

2. (P. E.) Prepared calamine, 1 part; simple cerate (Ph. E.), 5 parts; mix.

3. (Ph. D.) See OINTMENT.

4. (Commercial.) Hard suet, 5 lbs.; lard, 3 lbs.; melt, and sift in, gradually, calamine, 4 lbs.; agitate well for a few minutes, or until the whole is perfectly mixed, and after one minute's repose, pour it off into another vessel, the coarse sediment that has fallen to the bottom being carefully avoided; lastly, stir assiduously, until it is nearly cold. This forms the TURNER'S CERATE of the wholesale druggists. In many cases nothing but lard and calamine are used.

Uses, &c. When honestly prepared with genuine calamine, it is a most valuable desiccant and astringent application to excoriations,

fine powder), 1 oz.; spermaceti c
mix.

2. (Parrish.) Cantharides, 12
10 parts; yellow wax and resin,
parts; incorporated by fusion.
used to keep blisters open, and t
issues, and indolent ulcers and tum

Cerate, Chalk. *Syn.* CERA'TUM
Prep. 1. Chalk (thoroughly dr
fine powder), 2 drs.; simple cerate,
mond oil, 3 drs. *Used* in piles, and

2. (Acetated.) See KIRKLAND'
CERATE.

3. (Compound; CERA'TUM C
POS'ITUM, L.)—*a.* To simple c
1 oz.; add powdered catechu, ½ dr.
and foul and indolent ulcers.

b. (U.S. Hospital.) Lead plaste
oil, of each, 8 oz.; white wax, 3 o
gether; add solution of subacetate o
thoroughly incorporate, and then
chalk (in fine powder), 5 oz. C
astringent. *Useful* in inflamed so
tions, piles, &c.

Cerate, Cher'ry-laur'el. *Syn.*
LAURO-CERASI, C. CALMANS, L. *P*
Simple cerate, 1 oz.; cherry-laurel
As an application to burns.

Cerate, Cincho'na. *Syn.* BA
CERA'TUM CINCHO'NÆ, L. *Prep.*
of bark, 2 drs.; simple cerate, 1 o

2. (Van Mons.) Simple cerate,
phor, 1½ dr.; melt together by a
then add gradually, decoction o
bark (concentrated), 1 oz., and tri
cold. *Used* as a dressing for ill-
ulcers.

Cerate, Cin'nabar. *Syn.* CER
BRUM. C. CINNABA'RIS. C. HYDRA

z.; mix, as last. Both the above commended as topical applica- nds and ulcers of the rectum, urethra; especially in those of racter; and in piles, &c.

'per. *Syn.* CUPRIA'TED CERATE; U'PRI; C. C. AMMONIA'TI, L. liaur.) Simple cerate, 8 parts; l solution of ammoniuret of cop- As a stimulant dressing for in- ; and in psorophthalmia, &c.

met'ic. *Syn.* COLD CREAM, CE- 'LEN; CERA'TUM COSMET'ICUM, CREMOR FRIGIDA, L.; POMMADE r. *Prep.* 1. Oil of sweet almonds, wax and spermaceti, of each, pour the mixture into a marble d mortar, which has been heated for some time in boiling water; lly, rose water, 10 fl. oz., assidu- ng until an emulsion is formed; add, oil of bergamot, ½ oz.; oil of dr.; and continue the stirring or until the whole has become cold.

last, add otto of roses, 1 dr.; oil , 15 drops.

almonds, 5 oz.; spermaceti, 5 drs.; 4 drs.; rose water, 3½ oz.; balm of ine), 8 drops.

e last, with essence of vanilla, 15 ce of ambergris, 10 drops.

) White wax, 1 part; oil of almonds, e water, 3 parts; as before.

ons.) White wax and butter of ch, 1 part; oil of almonds and rose ch, 4 parts.

e above are used as agreeable and ollients for irritable surfaces, exco- re nipples, &c. See COLD CREAM ENTS.

ro'ton. *Syn.* CERA'TUM CROTO'NIS, (Caventou.) Lard, 5 parts; wax, lt, and when nearly cold, add croton *Used* as a counter-irritant; but ect the bowels.

u'lard's. See LEAD CERATE.

m'lock. *Syn.* CERA'TUM CO'NII, St. B. Hosp.) Spermaceti, 2 oz.; 3 oz.; melt, and add of hemlock l oz. *Used* for inveterate cancer- us, and other sores.

on'ey. *Syn.* CERA'TUM MEL'LIS, 1. Simple cerate, 3 parts; honey, of lemon grass, 6 drops. *Used* as

hirur.) Olive oil, ½ lb.; wax and (or galbanum plaster), of each, and add honey, ½ lb. As a cooling essing.

'sue. *Syn.* CERA'TUM AD PONTI- As issue plaster, but adding a little

rk'land's. *Syn.* KIRKLAND'S NEU- TE; CERA'TUM NEUTRA'LE, C. A'TUM, L. *Prep.* 1. *Lead plaster, oil, 4 oz. melt, sift in chalk,* 4 oz.; mix well, then add gradually, Goulard's extract, ¼ oz.; distilled vinegar, 4 oz.; and stir until cold.

2. (Paris.) Lead plaster, 8 oz.; olive oil and chalk, of each, 4 oz.; sugar of lead, 3 drs., (dissolved in) distilled vinegar, 4 fl. oz. As a cooling dressing to irritable ulcers and excoriated parts.

Cerate, Lead (Compound). *Syn.* GOU'LARD'S CERATE; CERA'TUM PLUM'BI COMPOS'ITUM (Ph. L.), L. *Prep.* (Ph. L.) Olive oil, 16 fl. oz.; yellow wax, 8 oz.; melt, remove the vessel from the fire, and when they begin to thicken, add gradually, solution of subacetate of lead (slightly warmed), 6 fl. oz.; and stir constantly until the whole is nearly cold; then add camphor, 1 dr., dissolved in olive oil, 4 fl. oz. (by heat), and stir until the cerate is quite cold. *Used* in similar cases to KIRKLAND'S CERATE (which *see*). See also ACETATE OF LEAD CERATE.

Cerate, Mar'shall's. *Prep.* 1. Palm oil and calomel, of each, 2 oz.; acetate of lead, 1 oz.; ointment of nitrate of mercury, 4 oz.; triturated together in a wedgwood mortar.

2. (Paris.) Palm oil, 5 oz.; calomel, 1 oz.; acetate of lead, ¼ oz.; citrine ointment, 2 oz.; as the last. Applied to the eyes, &c.

Cerate, Mercu"rial. *Syn.* CERA'TUM MERCURIA'LE, C. HYDRAR"GYRI, L. *Prep.* 1. (Guibourt.) Strong mercurial ointment and simple cerate, equal parts.

2. (Ph. L. 1746.) Strong mercurial ointment and yellow wax, of each, 6 oz.; lard, 3 oz. Both are used as dressings to venereal ulcers.

3. (Compound; CERA'TUM MERCURIA'LE COMPOS'ITUM, C. HYDRAR"GYRI, L.) *Prep.* (Ph. L.) Mercurial ointment (strong) and compound soap cerate, of each, 6 oz.; camphor (in powder), 1½ oz.; triturate together. Alterative and discutient; *used* to disperse indolent tumours and swellings, and as a resolvent in enlarged joints, &c.

Cerate, Meto"pium. *Syn.* CERA'TUM METO"PII, L. *Prep.* (Dr. Barham.) Hog-gum (from *Rhus Metopium*), and lard, of each, 4 oz.; white wax and root of Sweet Aristolochia (powdered), of each, 2 oz.; yellow resin, 1 oz.; in stiff joints and rheumatic pains.

Cerate, Mez'ereon. *Syn.* CERA'TUM MEZ'EREI, L. *Prep.* 1. Extract of mezereon, 1 part; (dissolved in) alcohol, 5 parts; add bees' wax, 5 parts; olive oil, 11 parts; melt together, and continue the heat until all the alcohol is evaporated.

2. Green oil of mezereon, 1 part; simple cerate, 20 parts; melt together. Both are used to keep up the discharge from blistered surfaces, and as a stimulant application to indolent sores.

Cerate, Neu'tral. See KIRKLAND'S CERATE.

Cerate, Ni'trate of Mer'cury. *Syn.* CIT'RINE CERATE; CERA'TUM HYDRAR"GYRI NITRA'TIS, L. *Prep.* (St. B. Hosp.) Citrine ointment and simple cerate, equal parts. See OINTMENTS.

Cerate, O'pium. *Syn.* LAUD'ANUM CERATE, AN'ODYNE C.; CERA'TUM O''PII, C. OPIA'TUM, C. ANODY'NUM, L. *Prep.* 1. Tincture of opium and olive oil, of each, 2 drs.; simple cerate, 1 oz.; digest with heat until all the spirit and water is evaporated, constantly stirring the mixture all the time.

2. (Gilbert.) Wine of opium, 1 dr.; simple cerate, 1 oz.

3. (Lagneau.) Opium (in fine powder), ½ dr.; yolk of 1 egg; mix, then triturate it with simple cerate, 1 oz.

Uses. The above are applied to painful swellings, piles, and ulcers, and in chronic ophthalmia, &c.

Cerate, Phosphora'ted. *Syn.* CERA'TUM PHOSPHO'RI, C. PHOSPHORA'TUM, L. *Prep.* 1. Phosphorus, 6 grs.; simple cerate, 3 oz.; heat together in a phial placed in a water bath, with frequent agitation for 2 hours; and after repose for 10 minutes, pour off the clear portion, and stir it well until cold.

2. (Foy.) Phosphorated ether, 5 parts; simple cerate, 24 parts.—*Uses.* Both of the above have been recommended as frictions in obstinate cutaneous affections, and in rheumatism of the joints.

Cerate, Pitch. *Syn.* CERATUM PI'CIS BURGUNDI'CÆ, L. *Prep.* (Beral.) White wax, 3 parts; suet, 4 parts; Burgundy pitch, 6 parts; melted together. A mild stimulant and detergent dressing. See OINTMENTS.

Cerate, Quin'ine. *Syn.* CERA'TUM QUINIÆ, L. *Prep.* 1. Sulphate of quinine, 5 or 6 grs.; simple cerate, 1 dr. Applied to the denuded dermis (endermically).

2. Sulphate of quinine and olive oil, of each, 1 dr.; simple cerate, 6 drs. As a friction. Both are used in intermittents.

Cerate, Res'in. *Syn.* BASIL'ICON, B. CERATE, B. OINTMENT, YELLOW B., CIT'RINE CERATE; CERA'TUM CITRI'NUM (Ph. L. 1788), C. RESI'NÆ FLA'VÆ (Ph. L. 1745), C. RESI'NÆ (Ph. L. 1809 and since), L. *Prep.* 1. (Ph. L.) Yellow resin and bees' wax, of each, 15 oz.; melt, add olive oil, 1 pint; strain through a cloth, and stir the mixture until cold.

Obs. The above is the formula of the London College, but the basilicon of the shops is seldom, if ever, made in this manner. The following forms are those commonly used in trade, but the products are much inferior to that made according to the directions in the Pharmacopœia.

2. (Commercial.)—*a.* Yellow resin, 10 lbs.; bees' wax, 2 lbs.; linseed oil, 7 lbs.; melt together, and stir until cold.

b. As the last, but using nut oil instead of linseed oil.

c. Nut oil, 1 gal.; bees' wax, 5 lbs.; yellow resin, 14 lbs.

d. Lard (common) and linseed oil, of each, *3 lbs.; yellow* resin, 9 lbs.; as before.

Uses, &c. This cerate is a mild stimulant, detergent, and digestive applicati
such is employed to dress foul
ulcers, blistered surfaces, burns, &
corresponding preparations of th
leges, see OINTMENTS.

3. (Compound; DESH'LER'S C
RA'TUM RESI'NÆ COMPOS'ITUM,
(Ph. U. S.) Resin, suet, and bees'
1 lb.; turpentine, ½ lb.; flax-seed
oil), ½ pint; as above. Rather
lating than resin cerate, but used
purposes.

Cerate, Rose. *Syn.* LIP SALVE;
ROSA'TUM, L. *Prep.* (P. C.) Oil
16 parts; white wax, 8 parts; al
1 part; digest, with a gentle heat,
ciently coloured, then strain, and
ounce of the cerate, add otto of ro
See LIP SALVE.

Cerate, Sav'ine. *Syn.* CERA'T
(Ph. E.; and Ph. L. 1836), L.
(Ph. E.) Bees' wax, 1 part; la
fresh savin (leaves, bruised), 2
together until the leaves become
strain, with pressure, throug
cloth.

2. (Ph. L. 1836.) Lard, 2 lbs;
1 lb.; bees' wax, ½ lb.; as last.

3. (Ph. L. 1851.) In the B. P.
ration is included among the
(which *see*); in trade, however, th
(Ph. L. 1836) is still generally reta

Obs. The preparation of this ce
caution, as the active principle of
being volatile, is injured by long b
high temperature. The leaves
boiled until they are crisp, but as thi
time, the essential oil, and conse
odour, is nearly all dissipated. A
is to express the juice from the le
add it to the wax and oil melted to
just beginning to cool. As usuall
in the shops, this cerate has a l
colour, and the odour of the fresh
neither of these is derived from th
the common process of making it.
is caused by the addition of powd
gris, and the last by adding a lit
essential oil of savin to the comp
nearly cold. The preparations of
Colleges have only a very pale g
and even that rapidly changes by
the air. A uniform green colour m
be regarded as a proof of adulterat
unadulterated compound, howev
prepared, is of a dingy green colo
intensity; and after it has been m
time, it fades on the surface, and
portion becomes streaky and mottle
quantity of colour is obtained fro
by long digestion in the fat and wa
vessels, at a moderate heat, tha
boiling. In this way a lively gr
times produced, but it rapidly ch
manner just mentioned.

The following forms are thes

e wholesale druggists for the
' this cerate:—
suet, of each, 6 lbs.; yellow wax,
them together in an earthen
oz. of distilled verdigris (pre-
down smooth in a mortar with
nt of sweet oil); strain, whilst
e earthen pot, and when the whole
tle, add of oil of savin, 1 oz., and

ves, 4 lbs.; yellow wax, 2 lbs.;
boil until the leaves become
rain, and add, of green ointment
d), 5 lbs.; when cooled a little,
of oil of savin, 3 drs., and stir
old. *Prod.* 13½ lbs.

Savin cerate and ointment are
yed to keep up the discharge
(perpetual blisters), for which
preferable to preparations of can-
he practice of colouring this
erdigris, which is general in trade.
severely censured, as its thera-
is thereby altered. The copper
ted by burning down a little in a
Hessian crucible, washing out the
little dilute nitric acid, placing
n a glass tube, and applying the
See COPPER and OINTMENTS.

s'ple. *Syn.* CERA'TUM SIM'PLEX,
L. (Ph. E.) Spermaceti, 1 part;
3 parts; olive oil, 6 parts; melt
heat, and stir until cold. This
is similar to SIMPLE OINTMENT
Simplex) B. P. (which *see*).

ap. *Syn.* COMPOUND SOAP CE-
A'TUM SAPO'NIS (Ph. L. 1836),
COMPOS'ITUM (Ph. L. 1851), L.
(Ph. L.) Boil litharge, 15 oz., in
egar, 1 gal., until dissolved, stir-
ually; then add of Castile soap,
ain boil until all the moisture is
; then add, gradually, bees' wax,
and olive oil, 1 pint, previously
ether, and stir until nearly cold.
SOAP CERATE PLASTER (*Emplas-*
ti Saponis) B. P. (which *see*).

lesale.) Distilled vinegar, 6 galls.;
lbs.; soap, 3¾ lbs.; yellow wax,
ive oil, 6 pints. Mix as above. Good
y oil may be used instead of olive oil.
less the instructions contained in
formulæ are followed in every par-
process is apt to miscarry. When
case, the cerate, on cooling, sepa-
wo portions, and is commonly full
ty particles. To prevent this, care
taken to use soap of the best
his mishap cannot be got over by
and stirring, as is generally sup-
e only remedy is the addition of a
soap, previously melted with some
gain evaporating to a proper con-
small quantity of solution of
a similar effect.
r *and consistence of soap cerate* chiefly depends on the length of time it is kept heated after the addition of the oil and wax. As evaporation proceeds, so the colour and consistence increase. Its usual colour is that of a lively, pale chocolate-brown, but occasionally it is much paler. This arises from its containing an undue quantity of moisture. When it has been kept heated for a period beyond that usually adopted, it attains greater hardness, and is then frequently called hard soap cerate (CERA'TUM SAPONIS DURUM); but by over-boiling it is apt to become gritty.

Uses, &c. Soap cerate is resolvent, cooling, and desiccative, and is chiefly employed as a cooling dressing for scrofulous swellings, &c. It may be spread on linen and applied like a plaster. It is sometimes used as a support for fractured limbs, and forms an excellent dressing for soft corns.

Cerate, Spermace'ti. *Syn.* WHITE CERATE, WHITE LIP SALVE, SIMPLE C.; CERATUM SIM'PLEX (Ph. E.), C. ALBUM (Ph. L. 1745), C. SPERMA'TIS CE'TI (Ph. L. 1788), C. CETA'CEI (Ph. L. 1809, and since), L. *Prep.* 1. (Ph. L.) Spermaceti, 2 oz.; white wax, 8 oz.; melt by a gentle heat; add, olive oil (warm), 1 pint, and stir with a spatula until they cool.

2. (Ph. E.) See SIMPLE CERATE.

3. (Ph. D.) The corresponding preparation of the Ph. D. is classed under *Ointments*, and contains lard.

4. (*Commercial.*) On the large scale lard or suet is substituted for oil, by which means less wax is required. The following is a good form where a cheap article is wanted, and is that commonly adopted in the wholesale trade:—

Clarified mutton suet, 5½ lbs.; white wax and spermaceti, of each, ¾ lb.; as above.

Obs. The materials should be melted by a very gentle heat (that of a water bath is best) in a clean stoneware vessel, and as soon as perfect liquefaction takes place, the heat should be withdrawn, and the fluid cerate strained into a clean vessel, and stirred with a clean wooden spatula until it solidifies. To facilitate the cooling, the vessel may be placed in cold water or in a current of cold air. In this way the product is rendered both whiter and finer than when the liquid mass is allowed to cool by itself. By adding a little flowers of benzoin with the oil, or a little nitric ether when the cerate is about half cold, this, as well as other like preparations, will keep for years without becoming rancid or suffering any material change of condition.

Uses, &c. Emollient and cooling. It is commonly employed as a soft, cooling dressing, as a lip salve, as an application to chaps, chilblains, &c.

Cerate, Sul'phur. *Syn.* CERA'TUM SULPHU'RIS, C. SULPHURA'TUM, L. *Prep.* (P. C.) Washed sulphur. 2 parts; cerate of Galen, 7 parts; almond oil, 1 part; mix. In itch, &c.

Cerate, Sul'phide of Mer'cury. *Prep.* (Swediaur.) *Yellow resin, ½ oz.;* yellow wax and *lard, of each, ¼ lb.;* vermilion, 20 grs. As a dressing to unhealthy ulcers. See Cinnabar Cerate.

Cerate, Tobac'co. *Prep.* Bees' wax, 3 oz.; yellow resin, 1 oz.; olive oil, 6 oz.; tobacco, juice, 4 oz.; mix and evaporate to dryness, and when nearly cold, add bergamot, 2 drs. *Used* to destroy pediculi, &c.

Cerate, Touch. *Syn.* Cera'tum pro tec'tu, L.; Cerat pour le toucher, Fr. *Prep.* (Soubeiran.) Spermaceti and yellow wax, of each, 1 part; olive oil, 16 parts; melt, add caustic soda, 1 part, and stir until cold. *Used* in hospitals for practising the touching in accouchements.

Cerate, Turner's. See Calamine Cerate.

Cerate, Ver'digris. *Syn.* Cera'tum æru'ginis, C. cu'pri diaceta'tis, L. *Prep.* 1. Resin cerate, 19 parts; verdigris (in fine powder), 1 part.

2. (For. Ph.) Wax and resin, of each, 6 parts; Venice turpentine, 5 parts; linseed oil, 2 parts; verdigris, 1 part. *Used* as a mild escharotic and stimulant to fungous ulcers, warts, corns, &c.

Cerate, White. See Spermaceti Cerate.

Cerate, Zinc. *Syn.* Cera'tum zinc'i, C. z. oxy'di, L. *Prep.* 1. Oxide of zinc, 20 grs. spermaceti cerate, 1 oz. *Used* in sore nipples, excoriations, &c.; and in chronic ophthalmia.

2. (Compound; Cera'tum zinci composi'tum, L.)—*a.* To the last, add calomel, 10 grs.; *Used* as the last, and in scrofulous ophthalmia.

b. (Mid. Hosp.) Zinc ointment and compound lead ointment, equal parts. Cooling, astringent; in excoriations, and as a dressing for ulcers.

c. (Hufeland.) Oxide of zinc and lycopodium, of each, 15 grs.; simple cerate, ½ oz. In sore nipples, ulcerations of the breast, tetters, &c. It acts best when diluted with half its weight of spermaceti cerate.

CEREB'RIC ACID. A peculiar acid compound, first noticed by M. Frémy, obtained along with oleo-phosphoric acid when the brain and nerves are treated with hot alcohol. It is solid, white, crystalline; freely soluble in boiling alcohol, and forms a solid gelatinous mass with hot water; fusible with decomposition, exhaling a peculiar odour, and leaving much charcoal behind. It has been found also in the yolk of eggs, in seminal fluid, and in pus. With the alkalies it forms insoluble salts termed cerebrates.

CEREB'ROLEIN. When oleo-phosphoric acid is boiled in water, it is resolved into a fluid neutral oil and phosphoric acid, which dissolves. The former is cerebrolein.

CE'RIN. $HC_{27}H_{53}O_2$. (Brodie.) *Syn.* Cerotic acid. When pure bees' wax (bleached) is digested in boiling alcohol for some time, a solution of myricin and cerin is formed. The former is deposited as the liquid cools, and the latter may be obtained by evaporating the decanted portion. *Cerin* is a *white, crystallisable* substance, soluble in 16 *parts of boiling* alcohol; it fuses at 144° Fahr.; and is readily saponified wi alkaline lyes. It greatly resembl wax, of which, indeed, it forms fro 80%.

CE'RIUM. Ce. A metal dis 1803 by Hisinger and Berzelius, in ral named *cerite.*

CE'ROMEL. *Prep.* (Van Mons.) 1 oz.; honey, 4 oz.; melt together until cold. An excellent application table ulcers, abraided surfaces, sore &c.

CERO'TIC ACID. See Cerin.

CE'TIN. $C_{32}H_{64}O_2$. Chevreul ap name to pure spermaceti. *Prep.* spercaceti in boiling alcohol, and c crystals that are deposited as the cools. Bright pearly crystals, melting and subliming at 670° Fahr. See Ceti.

CETRAR'IC ACID. $H_2C_{18}H_{14}O_8$. trar'in. The bitter principle of Ic (*Cetraria Islandica*). It exists, in state, in the cortical portion of the th

Prep. 1. Iceland moss (bruised), rectified spirit, 6 parts; boil in a vessel for half an hour; express the whilst hot, filter, and distil off the spi dissolve the residuum in boiling alco cant the clear, and let the solution cool lastly, collect the crystals and preserv out of contact with air.

2. (Herberger.) Iceland moss (in powder), 1 lb.; alcohol (·883), 4 lbs.; before, cool until vapours cease to rise, the tincture, add hydrochloric acid, (dissolved in) water, 2 oz.; let it rest night in a closed matrass; then decant, the deposit on a filter, press it in bi paper, and whilst still moist, wash it both alcohol and ether; lastly, purify it gestion in boiling alcohol, as before.

Prop., &c. Pure cetraric acid occurs the form of minute, shining, acicular cr it is intensely bitter, non-volatile, soluble in water, ether, and cold soluble in alkaline solutions forming salts, which give a red colour with t salts of iron, and a yellow one with ac lead. The compounds are called *cetrar* *Dose.* 2 to 4 grs. every three hours febrifuge; 1 to 3 grs. thrice daily, as a

CHA'BERT'S OIL. *Syn.* Chabert's reumat'ic oil; O'leum empyreuma Chaberti, O. contra tæniam Chab *Prep.* (Ph. Bor. 1847.) From em matic oil of hartshorn, 1 part; oil of tine, 3 parts; mix and distil over three only in a glass retort, and keep it i stopped bottles. In tape-worm.—D teaspoonfuls in water, night and m until 4 to 6 or even 7 oz. have been ta cathartic being also administered from time.

CHAIRS. The black leather work of settees, &c., may be restored by the addition of a saccharated solution of lime, indicating absence of phosphate. (B. P.)

Uses, &c. In *medicine*, as an absorbent, antacid, and desiccant; in acidity, heartburn, dyspepsia, and other like stomach affections, and in diarrhœa, depending on acidity or irritation; in the latter, generally combined with aromatics, astringents, or opium. It forms a valuable dusting powder in excoriations, ulcers, &c., especially in those of children.—*Dose.* 10 grs. to a spoonful, in a little water or milk, or made into a mixture with mucilage or syrup.

Chalk, Red. A natural clay containing about 18% of protoxide and carbonate of iron.

CHALYB'EATES. *Syn.* CHALYBEA'TA, FERRUGIN'EA, L. The medicinal qualities of the preparations of iron are noticed under the name of that metal. Those most frequently employed in medicine are—IRON FILINGS; QUEVENNE'S IRON; the BLACK OXIDE, MAGNETIC OXIDE, and SESQUIOXIDE OF IRON; the AMMONIO-CHLORIDE and SESQUICHLORIDE; the CARBONATE and SACCHARINE CARBONATE; the CITRATE and AMMONIO-CITRATE; the IODIDE, LACTATE, and SULPHATE; the TARTRATE, AMMONIO-TARTRATE, and POTASSIO-TARTRATE OF IRON; and the CHALYBEATE MINERAL WATERS. For the doses, &c., see the respective articles.

CHAM'OMILE. *Syn.* ANTHE'MIS, L. The flowers of the *Anthemis nobilis* (*Anthemidis Flores*, B. P.). They are bitter, stomachic, and tonic; in dyspepsia, loss of appetite, intermittents, &c. They are an effectual remedy for nightmare; and, according to Dr. Schall, the only certain remedy for that complaint.—*Dose.* 10 grs. to ½ dr., or more, in powder or made into a tea. Fomentations are also made with it. See EXTRACTS, OILS, PILLS, &c.

CHAMPAGNE'. See WINES.

CHAPS. These are too well known to require description. Chapped hands are common amongst persons with a languid circulation, who are continually "dabbling" in water during cold weather. Chapped lips generally occur in persons with pallid, bluish, moist lips, who are much exposed to the wind in dry, cold weather; especially in those who are continually moving from heated apartments to the external air. The application of a little COLD CREAM, POMATUM, SPERMACETI OINTMENT, LARD, or any similar article, will generally prevent chaps on the lips, and chaps and chilblains on the hands. Persons employed in oil and tallow works, or about oil, and who have consequently their hands continually in contact with greasy matter, never suffer from these things. A little oil or unguent of any kind, well rubbed on the hands on going to rest (removing the superfluous portion with a cloth), will not only preserve them from cold, but tend to render them both soft and white. See CHILBLAINS.

CHAR (Potted). The flesh of the Salmo *Alpinus* (Linn.), or trout of the
in the lakes of Lapland, pres
common process of potting.

CHAR'BON-ROUX [Fr.]. See
COAL (*below*).

CHAR'COAL. Charcoal is
ring organic substances, such
blood, &c., and is, in other
fixed residuum of vegetable or
exposed to a high temperature o
with atmospheric air.

There are several different vari
coal, the chief of which, howe
and animal charcoal.

Charcoal, Animal. *Syn.* A
BONE BLACK, IVORY BLACK, C.
LIS. The charcoal obtained by i
in close vessels, but often applie
any charcoal obtained from anim

Commercial. Bones (depriv
grease by boiling) are broken
put into small cast-iron pots, va
to ½ an inch in thickness. T
being filled, are dexterously plac
mouths together and then lute
A number of these vessels are th
by side and piled on each other
resembling a potter's kiln, to th
100 or 150, or even more. Th
kindled, and the heat kept up st
or 12 hours, according to circum
the process is completed. The
allowed to cool before opening th

A more economical method is
as under:—

Bones (previously boiled for
are introduced into retorts sin
used in gas works, and heat bein
volatile products are conveyed
pipes to cisterns where the conde
is collected. As soon as the proc
tion is finished, the solid resi
retorts, while still red hot, is rem
their lower ends into wrought-i
which are instantly closed
covers, and luted over. These a
to the ground by a crane, and
cool.

The bones having been ca
ground in a mill, and the res
powder, sorted by sieves into t
granular, somewhat resemblin
for decolorising liquids, and th
fine, to be used as a pigment.
sold under the name of animal
second, as bone or ivory black
and other fine varieties of anim
fully described under the head o
MENTS.

Uses, &c. This crude animal
sesses the valuable property o
and other saline matter from sy
aqueous solutions, especially o
the same time that it decolo
power as a decoloriser may be te
it to a solution of brown sugar

Fresh carbonised bread forms an excellent charcoal, both for a prophylactic and a tooth powder.

Charcoal varies in its qualities according to the substance from which it is prepared; that of the soft woods (willow or alder) is best for crayons and gunpowder; that of the hard woods for fuel, and for blowpipe supports. That made by a low-red heat, not exceeding cherry red, and which has a dull surface, is the most valuable. If the heat is carried much beyond this point, the charcoal acquires a brilliant surface, and deteriorates in quality. Chestnut charcoal is preferred by smiths for forging, as it not only burns slowly, but deadens as soon as the blast ceases. Areca-nut charcoal is preferred as a dentifrice; but the willow charcoal or box-wood charcoal is usually substituted for it by shopkeepers.

Ant., &c. Poisoning or suffocation, resulting from respiring the fumes of burning charcoal, has been already alluded to, and the treatment briefly pointed out. See CARBONIC ANHYDRIDE.

CHAR'GES (for Cattle). See VETERINARY MEDICINE.

CHAR'RING (Surface). The operation by which the surface of wood is carbonised, to prevent its decay from exposure to air and moisture. Stakes and piles are generally thus treated before they are driven into the ground. Casks are charred on the inside by coopers when they are intended to hold water. In both these cases the fire is commonly applied directly to the wood. A new method has, however, been lately employed with apparent success. This consists in washing the wood with the strongest oil of vitriol. In this way, not only the outer surface, but the surface of all the cracks and holes, gets carbonised, which is not the case when heat is employed. It succeeds admirably with musty casks and vats.

CHEESE. *Syn.* CA'SEUM, CA'SEUS, L. The curd of milk compressed into a solid mass. That of commerce is usually salted and dried, and in some varieties it is also coloured and flavoured.

The process of cheese-making is one which is eminently interesting and scientific, and which, in every gradation, depends on principles which chemistry has developed and illustrated. When a vegetable or mineral acid is added to milk, and heat applied, a coagulum is formed, which, when separated from the liquid portion, constitutes cheese. Neutral salts, earthy and metallic salts, sugar, and gum Arabic, as well as some other substances, also produce the same effect; but that which answers the purpose best, and which is almost exclusively used by dairy farmers, is rennet, or the mucous membrane of the last stomach of the calf. Alkalies dissolve this curd at a boiling heat, and acids again precipitate it. The solubility of cheese in milk is occasioned by the presence of alkaline phosphates and of free alkalies. In fresh milk th
may be readily detected by th
possesses of restoring the colou
litmus paper. The addition of
tralises the alkali, and so pr
curd in an insoluble state. T
of cheese-making is thus e
Liebig:—

"The acid indispensable to t
of milk is not added to the mil
paration of cheese, but it is form
at the expense of the milk-sug
small quantity of water is left i
a small quantity of a calf's sto
hours, or for a night; the wat
minute a portion of the mucou
to be scarcely ponderable; this
milk; its state of transformati
nicated (and this is a most imp
stance), not to the cheese, but to
the elements of which transpo
into lactic acid, which neutrali
and thus causes the separation
By means of litmus paper the p
followed and observed through
the alkaline reaction of the
soon as the coagulation begins.
is not immediately separated f
the formation of lactic acid
fluid turns acid, and the chees
into a state of decomposition.

"When cheese-curd is kept
a series of transformations take
sequence of which it assumes
properties; it gradually becon
parent, and more or less soft, t
whole mass; it exhibits a feebl
and develops the characteristic
Fresh cheese is very sparing
water, but after having been le
two or three years, it become
all the fat be previously re
completely soluble in cold wate
it a solution, which, like milk
by the addition of the acetic or
The cheese, which whilst fresh
turns during the maturation,
it is called, to a state similar t
it originally existed in the
English, Dutch, and Swiss che
nearly inodorous, and in the su
French cheese, the caseine
present in its unaltered state.

"The odour and flavour of
owing to the decomposition
the non-volatile acids, the mar
acids, and the volatile butyric
caproic acids, are liberated in
the decomposition of glycerin
imparts to cheese its charac
odour, and the differences in
aromatic flavour depend upon
of free butyric, capric, and
present." In the cheese of ce
districts, valerianic acid has
along with the other acids

traction of cream from the milk—the separation of the curd from the whey with or without compression—the salting of the curd—the collection of the curd, either whole or broken, before pressing—the addition of colouring matter, as annotta or saffron, or of flavouring—the place and method of storing—and the length of time allowed for maturation, all tend to alter the taste and odour of the cheese, in some or other particular, and that in a way readily perceptible to the palate of the connoisseur. No other alimentary substance appears to be so seriously affected by slight variations in the quality of the materials from which it is made, or by such apparently trifling differences in the methods of preparing it.

Var. The varieties of cheese met with in commerce are very numerous, and differ greatly from each other in richness, colour, and flavour. These are commonly distinguished by names indicative of the places in which they have been manufactured, or of the quality of the materials from which they have been prepared. Thus, we have Dutch, Gloucester, Stilton, skimmed-milk, raw-milk, cream, and other cheeses; names which explain themselves. The following are the principal varieties met with in Europe:—

Cheese, Brick-bat. From its form; made in Wiltshire of new milk and cream.

Cheese, Cheddar. A fine, spongy kind of cheese, the eyes or vesicles of which contain a rich oil; made up into round, thick cheeses, of considerable size (150 to 200 lbs.).

Cheese, Cheshire. From new milk, without skimming, the morning's milk being mixed with that of the preceding evening, previously warmed, so that the whole may be brought to the heat of new milk. To this the rennet is added, in less quantity than is commonly used for other kinds of cheese. On this point, much of the flavour and mildness of the cheese is said to depend. A piece of dried rennet, of the size of half-a-crown, put into a pint of water over night, and allowed to stand until the next morning, is sufficient for 18 or 20 gallons of milk. In large, round, thick cheeses (100 to 200 lbs. each). They are generally solid, homogeneous, and dry, and friable rather than viscid.

Cheese, Cottenham. A rich kind of cheese, in flavour and consistence not unlike Stilton, from which, however, it differs in shape, being flatter and broader than the latter.

Cheese, Cream. From the "strippings" (the last of the milk drawn from the cow at each milking), from a mixture of milk and cream, or from raw cream only, according to the quality desired. It is usually made in small oblong, square, or rounded cakes, a gentle pressure only (that of a 2 or 4 lb. weight) being applied to press out the whey. After twelve hours, it is placed upon a board or wooden trencher, and turned every day, *until dry. It ripens* in about three weeks. A little salt is generally added, and f
little powdered lump sugar.

Cheese, Derbyshire. A small
variety, very similar to Dunlop ch

Cheese, Dunlop. Rich, whi
tery; in round forms, weighing fr
60 lbs.

Cheese, Dutch. (Holland.) C
form. 5 to 14 lbs. each. Those
are very highly salted; those f
less so.

Cheese, Gloucester. Single Gl
milk, deprived of part of its cre
Glo'ster, from milk retaining the
cream. Mild tasted, semi-buttery
without being friable; in large, ro
forms.

Cheese, Green or Sage. From
with the juice or an infusion or
sage leaves, to which marygold
parsley are frequently added.

Cheese, Gruyère. A fine d
cheese made in Switzerland, and
sumed on the Continent. It is fi
and exhibits numerous cells of
magnitude. Its flavour is peculia
generally liked by English people.

Cheese, Lincoln. From ne
cream; in pieces about 2 inches
and will not keep over 2 or 3 mon

Cheese, Neufchâtel. A mu
variety of Swiss cheese; made of
weighs about 5 or 6 oz.

Cheese, Norfolk. Dyed yell
notta or saffron; good, but not
cheeses of 30 lbs. to 50 lbs.

Cheese, Parmesan. (Parma,
the curd of skimmed milk, ha
gentle heat. The rennet is ad
120°, and an hour afterwards,
milk is set on a slow fire until he
150° Fahr.; during which the cu
in small lumps. A few pinches o
then thrown in. About a fo
making, the outer crust is cut off,
surface varnished with linseed oil,
coloured red.

Cheese, Roquefort. From
the best prepared in France. I
sembles Stilton, but is scarcely o
ness or quality, and possesses a
gency and flavour.

Cheese, Slipcoat or Soft.
white cheese, somewhat resembli
present use only.

Cheese, Stilton. The riche
cheese made in England. From
which cream taken from other
in cheeses generally twice as hi
broad. Like wine, this cheese
proved by age, and is therefore
before it is 2 years old. A spu
ance of age is sometimes given t
it in a warm, damp cellar, or by
with masses of fermenting straw,

Cheese, Suffolk. From

:orms, from 24 lbs. to 30 lbs.
rd and horny.
ss. The principal cheeses made
are the Gruyère, the Neuf-
: Schabzieger or green cheese.
ıvoured with melilot.
STPHALIAN. In small balls or
l lb. each. It derives its pecu-
m the curd being allowed to
ly putrid before being pressed.
r rolls of about 1 lb. each.
VILTSHIRE. Resembles poor
o'ster. The outside is generally
mixture of ruddle or red-ochre

RK. From cream: it will not

Cheese has been objected to
of diet, but without sufficient
it is, when of good quality,
ritious, wholesome, and digestible.
: food, cheese digests more readily
sticated, and the neglect of this
one reason why it frequently dis-
lelicate stomachs. It is rendered
le to many palates by toasting it,
less digestible by that operation.
f cheese is casein or coagulated
in substance; it therefore cannot
nutritious, provided it is properly
Cheese-curd, carefully freed from
milk by expression, and the addi-
is a mixture of casein and butter.
all the phosphate of lime and part
hate of soda of the milk. (Liebig.)
s as a condiment, especially when
l, it powerfully promotes the secre-
e saliva and gastric juice, and
s the stomach in performing its
tions. Rotten cheese is very un-

y *remarks*. It is surprising that
t more frequently made an article
manufacture, especially by house-
st in the country. The operations
aking are all exceedingly simple,
borious, and will, in most cases,
the outlay for the milk. Besides,
unfrequently coloured with stains
s, which are injurious, and even
e risk of taking which is not en-
en it is made at home. Several
nearly lost their lives from eating
red with annotta, for instance.
ce, though harmless in itself, is
ulterated with red lead, so that
nger may very innocently intro-
lful poison, when he only intends
e colour of his goods.
hole cheese is cut, and the con-
ll, it is generally found to become
dry, and to lose flavour before it
This is best prevented by cutting
uantity for a few days' consump-
he cheese, and *keeping the re-*
cool place, rather damp than dry, spreading a thin film of butter over the cold surface, and covering it with a cloth or pan, to keep off the dirt. This removes the objection existing in small families against purchasing a whole cheese at a time. The common practice of buying small quantities of cheese should be avoided, as not only a higher price is paid for any given quality, but there is little likelihood of obtaining exactly the same flavour twice running. Should cheese become too dry to be agreeable, it may be used for stewing, or for making grated cheese or Welsh rare-bits.

Cheese, Ap'ple. The pomace or ground apples from the cider press.

Cheese, Dam'son. *Prep.* From damsons boiled with a little water, the pulp passed through a sieve, and then boiled with about one fourth the weight of sugar, until the mixture solidifies on cooling; it is next poured into small tin moulds previously dusted out with sugar. Cherry cheese, gooseberry cheese, plum cheese, &c., are prepared in the same way, using the respective kinds of fruit. They are all very agreeable candies or confections.

Cheese, Facti'tious Roque'fort. *Prep.* (Roulle.) The gluten of wheat is kneaded with a little salt, and a small portion of a solution of starch, and made up into cheeses. It is said that this mixture soon acquires the taste, smell, and unctuosity of cheese, and when kept a certain time is not to be distinguished from the celebrated Roquefort cheese, of which it possesses all the peculiar pungency. By slightly varying the process, other kinds of cheese may be imitated.

Cheese, Legu'minn. The Chinese prepare an actual cheese from peas, called "tao-foo," which they sell in the streets of Canton. The paste from steeped ground peas is boiled, which causes the starch to dissolve with the casein; after straining the liquid, it is coagulated by a solution of gypsum; this coagulum is worked up like sour milk, salted, and pressed into moulds.

Cheese, Toast'ed. This much relished article is seldom well prepared. The following has been recommended as an excellent receipt:—Cut the cheese into slices of moderate thickness, and put them into a tinned copper saucepan, with a little butter and cream; simmer very gently until they are quite dissolved, then remove the saucepan from the fire, allow the whole to cool a little, add some yolk of egg, well beaten, add spice, make the compound into a "shape," and brown it before the fire. See FONDUE.

CHEL'SEA PEN'SIONER. *Prep.* From gum guaiacum, ¼ oz.; rhubarb, ½ oz.; cream of tartar, 2 oz.; flowers of sulphur, 4 oz.; nutmegs, 2 in number; (all in powder); honey, 1½ lb., or q. s.; made into an electuary by beating them together in a mortar.—*Dose.* 1 to 2 table-spoonfuls, night and morning, in gout and chronic rheumatism. The name is said to have been given to it from the circumstance of a Chelsea pensioner having cured Lord Amherst with it.

CHEL'TENHAM SALTS. See SALTS.

CHEM'IQUE or CHEM'IC BLUE. See INDIGO.

CHEROOT'. A species of cigar imported from Manilla, in the Philippine Islands, distinguished by extreme simplicity of construction, as well as delicacy of flavour. The cigars now so commonly sold as cheroots in England are, for the most part, made of inferior tobacco, and are often much adulterated articles.

CHER'RIES are the fruit of different species of the genus *Cerasus*. They are regarded as wholesome, cooling, nutritive, laxative, and antiscorbutic. Brandy flavoured with this fruit or its juice is known as cherry-brandy. Morello cherries preserved in brandy are called brandy cherries. See BRANDY, FRUIT, &c.

CHER'RY LAUR'EL. *Syn.* LAU'REL. The *Cerasus Lauro-Cerasus*, a shrub common in every garden in England, and often confounded with the true Laurel or Sweet Bay, which does not possess any of its deleterious properties. Leaves, occasionally used instead of bay leaves in cookery. The distilled oil and distilled water are both poisonous. See OIL, WATER.

CHI'CA. The red colouring matter deposited by a decoction of the leaves of *Bignonia Chica* in cooling. *Used* by the American Indians to stain their skin. It is soluble in alcohol, ether, oil, fat, and alkaline lyes, and slightly so in boiling water.

Chi'ca. See MAIZE-BEER.

CHIC'ORY. *Syn.* WILD SUC'CORY; CICHOR'IUM INTY'BUS (Linn.), L. A plant belonging to the natural order *Compositæ*. It is indigenous to this and many other countries of Europe, and is extensively cultivated for the sake of its roots, which are sliced, roasted, and ground, to form the chicory of the shops. Nearly 100 millions of pounds are annually consumed in Europe. Much of the chicory used in Britain is of home growth; but still more is imported in a raw state from Holland and other parts of the Continent. A blue dye has been prepared from the leaves of this plant.

The FRESH ROOT OF CHICORY (*ra'dix chico'rii re'cens*) is reputed to be alterative, attenuant, diuretic, febrifuge, hepatic, resolvent, and tonic; and in large doses, aperient. It is now seldom used in medicine, although it appears to possess similar qualities and equal activity to those of dandelion. "An infusion of the root, mixed with syrup, becomes thick; forming the GOMME SACCHO-CHICORINE of Lacarterie." (Fee.)

The ROASTED ROOT is prepared by cutting the full-grown root into slices, and exposing it to heat in iron cylinders, along with about 1½% or 2% of lard, in a similar way to that *adopted for coffee*. When ground to powder [illegible] *mill, it constitutes* the CHICORY of the

grocers (CHICORY COFFEE, SUCCO
DIX CHICO'RII TORREFAC'TA, R.
TRI'TA); so generally employed bo
stitute for coffee and as an adulte
article. The addition of 1 part of
roasted chicory to 10 or 12 par
forms a mixture which yields a be
fuller flavour, and of a deeper
that furnished by an equal quantit
unmixed coffee. In this way a le
of coffee may be used, but it shoul
bered that the article substituted
not possess in any degree the pecul
soothing, and hunger-staying p
that valuable product. The use,
a larger proportion of chicory th
named imparts to the beverage
flavour, intermediate between tha
and liquorice; whilst the contin
roasted chicory, or highly chico
seldom fails to weaken the powers
and derange the bowels. "There
doubt that roasted chicory must,
largely, have a tendency to excite
(Pereira.)

Pur., &c. The ground chicory o
like ground coffee, is almost unive
terated. Pigments are added to
it, and various vegetable substanc
its value. The following articles
reported to have been detected
chicory, or to have been known to
adulterate it:—Venetian red, redd
clay; roasted acorns, beans, carro
dog-biscuits, damaged bread, dam
horse-chestnuts, mangel wurzel, pa
rye, and sugar; coffee flights (co
coffina (roasted lupins), Hamb
(roasted peas coloured with reddl
marc of coffee; exhausted bark (
yards), logwood dust, mahogany d
has also been asserted that the sc
of bullocks, horses, and dogs, ha
plied to the same purpose; but o
is not sufficient evidence. The
avoid being thus cheated or poiso
the chicory whole, and to grind it

Roasted chicory is highly hy
absorbent of moisture, and shoul
be always kept in close vessels
canisters), the same as coffee.
become tough or soft, or the pow
gether, it is unfit for use; but i
it may be recovered, by exposing
in an oven until it again becomes
or brittle.

Tests.—1. Powdered chicory
water turns it reddish-brown
sinks, leaving light impurities ei
or diffused through the liquid.—
decoction tested with tincture, o
iodine, gives a brown colour;
purple, blue, or black, it indica
sence of roasted peas, beans, rye, o
like substance, containing starch.
phate or perchloride of iron,

ould not materially affect the
urns it bluish or blackish, it in-
resence of roasted acorns, oak-
ome other substance containing
ater acidulated with vinegar, di-
powder, should not be blackened,
rially darkened, by tincture of
tion of red prussiate of potash;
shows the presence of ferrugi-
ng matter.—5. The dry powder,
ted, should not leave more than
h, which should be of a grayish
r; the contrary indicates the pre-
le, red clay, ochre, or the like.—
ove may be added attention to
lour, and appearance, both to the
d under the microscope; by the
eration may be easily detected.

IN. *Syn.* PER'NIO, L. An in-
swelling, of a purple or lead colour,
the action of cold. Chilblains
) exclusively attack the extremi-
ody, and are generally confined to
toes, and heels. The common
e itching and irritation, more or
, often accompanied with shooting
enderness, and tumefaction of the
dren, especially those of a scro-
, and elderly persons, are generally
ible to chilblains. The common
lblains is holding the hands or feet
ter exposure to cold. The sudden
emperature partially destroys the
the minute surfacial vessels, and
s the proper flow of blood through
he best preventives of chilblains
socks or stockings, good water-
woollen gloves, exercise, and fric-
act by promoting the circulation
n the extremities, and protecting
cissitudes of temperature. When
e once formed, the best treatment
th stimulants, as spirits of wine
, oil of turpentine, opodeldoc,
camphorated oil, hartshorn and
inaeus recommends bathing the
lute muriatic acid, just strong
ntly prick the skin. When the
have ulcerated, they are com-
KIBES. In this state they should
h a little resin cerate, or elemi
fungous granulations appear,
removed by touching them
of silver or blue vitriol. See

FOR CHILBLAINS.—The follow-
strongly recommended by dif-
, and may all prove useful in
circumstances and convenience
—

of copper, 1 oz.; rosemary water,
rs.

ssine, 1 oz.; vinegar, ½ pint.

ssine, 1 oz.; *rum, ½ pint; cam-
he affected part is wetted with* the above night and morning, and when dry, is touched with a little simple ointment, cold cream, or pomatum.

4. Soap liniment, 2 oz.; tincture of cantharides, 1 oz.; oil of cajeput, 2 drs.

5. Oil of turpentine, 2 oz.; camphor, 3 drs.; oil of cajeput, 1 dr. The application of the last two is accompanied by gentle friction.

6. (DR. GRAVES' PREVENTIVE.) Sulphate of copper, 20 grs.; water, 1 oz. As the first three.

7. (LEJEUNE'S BALSAM.) See CHILBLAIN BALSAM.

8. (LINNÆUS' REMEDY). Hydrochloric acid, 1 oz.; water, 11 oz. As No. 3.

9. (MORTON'S LINIMENT.) Calomel and camphor, of each, 1 dr.; spermaceti ointment, 4 drs.; oil of turpentine and cocoa-nut oil, of each, 2 drs. As No. 5.

10. (RUSSIAN REMEDY.) The rind of perfectly ripe cucumbers, dried with the soft parts attached. For use, they are placed with the inner side, previously soaked in warm water, over the soft parts. (Med. Zeitung.)

11. (SWEDIAUR'S PASTE.) Bitter almonds, 8 oz.; honey, 6 oz.; powdered camphor and flour of mustard, of each, ½ oz.; burnt alum and olibanum, of each, ¼ oz.; yolks of 3 eggs; beat to a paste. To be applied night and morning.

12. (VANCE'S CREAM.) Ointment of nitrate of mercury, 1 oz.; camphor, 1 dr.; oil of turpentine, 2 drs.; oil of olives, 4 drs.; mix well together. To be applied, by gentle friction, 2 or 3 times daily.

Obs. All the preceding preparations are intended for chilblains before they break. The liniments of ammonia, camphor, opium, soap, and turpentine, as well as the compound camphor liniment of the British Pharmacopœia, are also excellent preparations for the same purposes.

13. (WAHLER'S OINTMENT.) Black oxide of iron, bole, and oil of turpentine, of each, 1 dr.; resin cerate, 1 oz. For broken chilblains. We have found a mixture of equal parts of calamine cerate and resin cerate answer quite as well. See CERATE, OINTMENT.

CHIL'DREN (Care of). See INFANCY.

Children (Diseases of). See the respective heads, and DISEASES.

CHIL'LIES. See CAPSICUM, PEPPERS.

CHIM'NEYS were not introduced into England until the reign of Queen Elizabeth, and for a considerable period the principles of their construction were ill-understood. When the air inside and outside a chimney is at the same temperature, an equilibrium exists; there is no draught in the chimney, because the downward tendency of that within is counteracted by the upward pressure of that without. Let a fire be kindled in the grate; hot air is evolved, the chimney is heated, the air it contains suffers expansion, and a portion is *expelled. The chimney* now contains a smaller *weight of air than it* did before; the external and internal columns no longer equibalance each other, the warmer and lighter air is forced upwards from below, and its place is occupied by cold, and consequently heavier air. If the fire continues to burn, and the chimney retains its temperature, this second portion of air is disposed of like the first, and the ascending current continues, so long as the sides of the chimney are hotter than the surrounding air. Should the reverse happen to be the case, as sometimes occurs from sudden atmospheric changes, the column of air within the chimney rapidly contracts in volume, the deficiency is filled up from without, the column of air becomes heavier than one of a corresponding height on the outside of it, or in the apartment, and, obeying the common laws of gravitation, it falls out of the throat of the chimney or fire-place, just as a heavy body sinks in water, and has its place occupied by air from above. In this way, a descending current, of more or less intensity and duration, is established, and, if there is a fire in the grate, the chimney "smokes," or, if the grate is empty, perhaps, the smoke from neighbouring chimneys finds its way into our apartments. By the judicious arrangement of the fire-place, and the throat and flue of a chimney, an upward current may be constantly ensured so long as there is a fire in the grate, or the air of the apartment is warmer than the external atmosphere.

Count Rumford was the first who scientifically investigated the construction of chimneys. He showed that more heat is obtained from the fire by reflection when the coverings are placed in an oblique position. He also directed that the fire itself should be kept as near to the hearth as possible, and that the throat of the chimney should be constructed much narrower than was then the practice, in order to prevent the escape of so much heated air as happened with wide throats. By contracting the open part of the fire-place immediately over the fire, as by lessening the width of the hobs, or by bringing the throat of the chimney closer to the fire, and by contracting the throat of the chimney itself, within certain limits, any desired amount of draught may be obtained. When the space above the fuel is too small, the throat too near the burning fuel, or the throat itself too contracted, the draught of a common chimney is often too strong, and much fuel and heat is wasted. When the reverse is the case, the draught is commonly too languid, the fire draws badly, a portion of the smoke escapes into the room, and all the usual annoyances of a smoky chimney are suffered. By a proper attention to these conditions, a common fire-place may be adapted for the combustion of bituminous or easy burning coal, or of anthracite, and varieties of coal that require a considerable draught. It may even be converted into a wind furnace; whilst the inconvenience of smoky chimneys may be always avoided, and when existing, easily cured. This is presuming, however, that a sufficien
air exists in front of the fire-place
apartment), not only for the co
the fuel, but also for the upward
the chimney. Many chimneys s
from the apartment being so ill-ve
the supply here alluded to is not p
may be further stated, as a ru
greater the length of a chimney, t
will be the draught. Hence, the c
the upper rooms of a house o
whilst the fires in the rooms be
burn pleasantly and vigorously.
are commonly relieved by a chi
cowl, of which numerous variet
before the public. The more
tortuous the course of a chimne
likely is it to be affected by eddi
of wind from neighbouring buildi
See FIRES, GRATE, SMOKE, STOVE.

CHI'NA. In the purchase of c
and earthenware, care should b
select those patterns which in case
can be the most readily matche
or rare patterns should be avoided
such be broken, it will generally b
difficult and expensive, and fre
possible, to replace them.

China, glass, and earthenware
dirty, are best cleaned with fine
fuller's earth and warm water,
rinsing in clean water. A littl
soap may be added to the wate
fuller's earth. See PACKING, Po

CHIN'OIDINE. See QUINOIDI

CHINOLINE BLUE. See CYA

CHI'TIN. This name has bee
hard, insoluble matter forming th
elytra of insects. It is obtained b
elytra of the cockchafer with w
ether, acetic acid, and alkalies.

CHIT'TICK'S REMEDY. D
remedy for stone consisted of a
administered in veal broth. (Pa

CHLORAL. C_2HCl_3O. A pe
first obtained by Liebig, by t
chlorine on alcohol.

Prep. (Liebig.) Anhydrous alc
in a tubulated retort, and dry
passed through it, at first in the c
wards with the application of a
until the chlorine passes uncha
the liquor on raising it to the b
rature; on cooling, the whole fo
line mass of chloral hydrate; t
by a gentle heat, and agitated wit
its volume of oil of vitriol; on i
heat a little, an oily stratum of i
rises to the surface. It is purifie
it for some time (to drive off free
acid and alcohol), next distillin
equal volume of oil of vitriol;
rectifying it from some powdere
the process being stopped as soo
face of the lime becomes dry.

Prop., &c. Chloral is an oil

common salt. Anhydrous chlorides are generally prepared by the direct action of chlorine on the bases.

Char., Tests, &c. Most of the metallic chlorides are soluble in water. Many fuse when heated, and volatilise unchanged, but others are completely or partially decomposed at a red heat. All, with the exception of those of the alkali and earth metals, are decomposed at a red heat in a current of hydrogen. They are recognised by the following reactions:—1. Heated with a little peroxide of manganese and sulphuric acid, chlorine is evolved, and easily detected by its colour, smell, and bleaching properties:—2. The soluble chlorides may be readily detected by their solutions, slightly acidulated with nitric acid, giving with a solution of nitrate of silver a white, curdy precipitate (chloride of silver), insoluble in nitric acid, freely soluble in liquor of ammonia, and blackened by the light:—3. The insoluble chlorides may be tested by digesting them in a little liquor of potassa, when a solution of chloride of potassium will be formed, which may be treated as just directed (2); or the chloride may be dissolved in nitric acid, and tested with nitrate of silver as before.

CHLORIM'ETRY. See CHLOROMETRY.

CHLORINA'TED LIME. See LIME.

CHLORINA'TED SO'DA. See SODA.

CHLO''RINE. *Syn.* CHLORIN'IUM, L.; CHLORE, Fr.; CHLOR, Ger. An elementary substance discovered by Scheele in 1774, and at first supposed to be a compound body. In 1809, MM. Gay-Lussac and Thènard suggested the probability of it being a simple substance; but it was reserved for Sir H. Davy, shortly afterwards, to demonstrate the truth of the suggestion of these foreign chemists.

Nat. hist. It exists in nature chiefly in the form of chloride of sodium, which constitutes rock salt when deposited in inland beds, sea salt when dissolved in masses of water. The sea also contains chlorides of potassium, calcium, and magnesium. It is a constituent of several well-known minerals. It has been met with in the air of volcanic districts, combined with hydrogen, as hydrochloric acid.

Prep. Strong hydrochloric acid is poured on half of its weight of finely powdered peroxide of manganese, previously placed in a glass flask or retort; chlorine gas is immediately evolved, even in the cold, but much more rapidly on the application of a gentle heat, and is collected in clean, dry bottles by displacement. The tube conducting the gas is so arranged as to reach to the bottom of the bottle, and the chlorine, being heavier than the air, displaces the latter without mixing with it. The bottle is known to be full by the gas, easily perceived by its green colour, overflowing the top of the vessel. The bottle is then closed up with an accurately fitting stopper, previously greased, and an empty one put in its place, which is subsequently treated in like manner.
gas entirely from hydrochlori
passed through a wash bottle
small quantity of water; and
quite dry, it is passed over fu
calcium. When the presence
no object, chlorine may be collec
water, or, what is better, a satu
of common salt, in the pne
The mercurial trough cannot b
the chlorine rapidly acts upon
becomes absorbed.

Commercial.—From oil of vit
of each, 7 parts, cautiously mix
to cool; chloride of sodium (c
parts, mixed intimately with pe
ganese, 3 parts. The dilute aci
a retort or other generating
powder added. The gas comes
first, but the application of a gen
it to rush forth in large quant
years, owing to the general dem
ing agents, numerous new me
taining chlorine have been pa
view of adopting a continuous p

Prop., Uses, &c. Chlorine is a
a yellowish-green colour, and a
cating odour. It is one of the
stances that are gaseous at
peratures, being nearly 2½ heavi
spheric air—sp. gr. 1·47. It i
considerable extent in water,
60° Fahr. absorbing about twi
It is non-inflammable, but it
some of the elements is atte
phenomena of combustion; th
copper leaf, powdered antimon
and several other substances
chlorine immediately inflame.
sure of 4 atmospheres, it is co
yellow, limpid liquid. Moist
cooled to 32° Fahr. condens
crystals, containing 35½ par
and 90 parts of water. The
able property of chlorine is, it
stroying almost all vegetabl
colours, and the putrid odour
organic matter; hence its valu
agent, and as a disinfectant
When first proposed as a b
by Berthollet, it was used m
way as sulphur is now in ble
goods; afterwards a solution
water was employed, but the
ment was Tennant's patent of
gas with lime to form "chl
With the bases chlorine form
series of compounds called chlo

Tests. Free chlorine is readil
from other gases by its colo
odour, and bleaching properties
solution dissolves gold leaf, an
of silver gives a white, curdy p

CHLO'RITE. A salt in whic
of chlorous acid, $HClO_2$, is repl
or other basic radical. See C

the application of the heat. On the common plan there is great danger of explosion, or of the liquid in the still being forced over into the receiver, owing to the extraordinary rapidity with which the vapours are eliminated, and the ingredients, in consequence, swell up. The method we have successfully adopted on the large scale, is to employ a very broad and shallow capsule-shaped still, having a flat rim round it, with a head or capital furnished with a corresponding rim at its lower part. In use, a flat, endless band of vulcanised India rubber is placed between the two rims, which are then held air-tight together by means of small, iron clamps. The application of heat is also delayed for some time after the admixture of the spirit with the other ingredients, and the process is interrupted as soon as the first violence of the reaction has subsided, by which time the whole product of chloroform will have passed over into the receiver. If the distillation is continued beyond this point, the remaining product is water. On the small scale, a very capacious, flat-bottomed retort or cucurbit should be employed. A similar refrigeratory may be used to that noticed under ether.

CHLOROHYPONI'TRIC GAS ($NOCl$) and **CHLORONI'TROUS GAS** ($N_2O_2Cl_4$) are two peculiar compounds, formed when nitric acid and hydrochloric acid are mixed.

CHLOROM'ETER. *Syn.* CHLORIM'ETER. An instrument or apparatus employed in chlorometry. The chlorometers in common use are graduated measures and tubes precisely similar to those used in ACIDIMETRY, ALKALIMETRY, &c.

CHLOROM'ETRY. *Syn.* CHLORIM'ETRY. The estimation of the available chlorine in the bleaching powder of commerce, which is valued and sold in this country by its percentage of that element. The plans generally adopted are applicable to the so-called chlorides of soda and potassa, as well as to the ordinary bleaching powder, chloride of lime. Most of them depend on the oxidising effect of water when undergoing decomposition through the action of chlorine.

Dalton's Process. The test-solution is prepared as follows:—Pure protosulphate of iron (previously dried by strong pressure between the folds of cloth or bibulous paper), 78 grs., are dissolved in distilled water, 2 oz., and a few drops of hydrochloric or sulphuric acid added. This quantity of protosulphate requires for complete peroxidation just the quantity of oxygen liberated by 10 grs. of chlorine; in other words, the solution exhibits the indirect effect produced by exactly 10 grs. of the bleaching element.

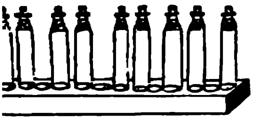
Exactly 50 grs. of the sample of chloride of lime to be examined are next weighed, and well mixed in a glass or wedgwood mortar with tepid water, 2 oz.; and the mixture poured into a graduated tube or chlorometer. *The tube is next* filled up to 0, or zero, with
the washings. of the mortar, and
well mixed, by placing the thu
orifice and shaking it. The solutio
of lime, thus formed, is next g
cautiously added to the solution of
iron, previously noticed, until t
completely peroxidised, which ma
when it ceases to be affected by a
red prussiate of potash. When a
latter test, placed upon a white
to give a blue colour on being t
the point of a glass stirrer or ro
the liquor under examination, e
solution of the chloride has been
number of measures thus consume
be carefully read off from the gra
of the chlorometer, from which t
of the sample may be estimated a
As 100 of the chlorometer divisi
exactly 50 grs. of the chloride u
nation, each measure will contain
and, consequently, the number o
consumed will represent half that
grains of the chloride examined
weight of the chloride thus used
contained 10 grs. of chlorine—t
quantity of that substance requi
oxide the test-solution of sulphat
Thus:—If 80 measures of the li
chlorometer have been consumed, t
will represent 40 grs. of chloride o
10 grs. of chlorine. By dividin
this number, the per-centage of c
be obtained. In the present in
would be—

$$\frac{1000}{40} = 25\tfrac{0}{0}.$$

Crum's Process. Equal weight
and hydrochloric acid are mixed t
cast-iron borings digested in the
until saturation is complete; a lar
iron being purposely employed, an
kept at the heat of boiling wat
time. One measure of the soluti
40° on Twaddell's scale (sp. gr. 1·
mixed with an equal quantity of
(sp. gr. 1·048). This forms the
When mixed with 6 or 8 parts of
quite colourless, but chloride of li
the production of peracetate of
gives it a red colour.

The above proof-solution is next
12 two-oz. vials, of exactly equal d
the amount of $\frac{1}{6}$th of their cap
are filled up with bleaching liqui
strengths; the first at $\frac{1}{12}$th of
Twaddell, the second $\frac{2}{12}$ths, and
$\frac{12}{12}$ths of 1°. They are then well
and, after agitation, arranged sid
a tray, furnished with holes to r
(See *engr.*) To ascertain the str
unknown sample of bleaching
proof-solution of iron is put in
exactly similar to the 12 previou

same proportion (⅛th). The
illed up with the bleaching
n, and placed beside that one
dy prepared which it most
r. The number on that phial
rength of the sample under
twelfths of a degree of Twad-
r.



ng the quantity of Bleaching
° on Twaddell's scale (sp. gr.
ired to be added to a weaker
ise it to the given strengths.
om Mr. Crum's table by Mr.

Required Strength.	Proportions required.	
	Given Sample.	Liquor at 6°.
	Parts.	Part.
$\frac{8}{12}$°	8	1
„	9¼	1
„	11	1
„	13½	1
„	17	1
„	23	1
„	35	1
„	71	1
$\frac{6}{12}$°	11	1
„	13½	1
„	17	1
„	23	1
„	35	1
„	71	1
$\frac{4}{12}$°	17	1
„	23	1
„	35	1
„	71	1
$\frac{3}{12}$°	23	1
„	35	1
„	71	1

preceding method is admirably
k solutions, such as are employed
extile fabrics, and is well adapted
plicity) to the purposes of prac-
ndeed, it is quite astonishing to
ease and accuracy it is applied
operatives. This gives it great
. It has been for some time in
n the bleaching houses of Scot-

o Mr. Crum, the range of strength
cotton is "safe," is very limited.
1° of Twaddell's scale (sp. gr.
more than safe, *while one at ⅓°*
*ciently strong for the first ope-*ration on stout cloth, unless it is packed more loosely than usual.

Gay-Lussac's Indigo Process. One part of the best indigo is dissolved in 9 parts of strong sulphuric acid, by the aid of a gentle heat; this solution is then mixed with distilled water, in such proportion, that 1 volume of chlorine gas shall exactly decolour 10 volumes of this solution. Each measure so decoloured is called a degree, and each degree is divided into fifths. 5 grs. of the best chloride of lime, dissolved in 500 gr. measures of water, possess the above power, and indicate 10° or proof; or in other words, will decolour 10 times its volume of the indigo solution.

Obs. This method of chlorometry is objectionable, and liable to error, from the indigo solution altering by keeping. When, however, the proper precautions are used, it may be safely trusted for weak bleaching liquors.

Arsenious Acid Process. This depends on the conversion, by oxidation, of arsenious acid into arsenic acid, in the presence of chlorine and water.

To prepare the test-liquor, pure arsenious acid, 100 grs. are dissolved in about 4 fl. oz. of pure hydrochloric acid (free from sulphurous acid), and the solution diluted with water until, on being poured into a graduated 10,000 grains-measure-glass, it occupies the volume of 7000 grains measure marked on the scale. Each 1000 grains measure of this liquid now contains 14·29 grs. of arsenious acid; corresponding to 10 grs. of chlorine, or $\frac{1}{10}$th gr. of chlorine for every division or degree of the scale of the chlorometer.

100 grs. of the chloride of lime to be examined are next dissolved in water as before, and poured into a tube graduated up to 2000 grains measure. The whole is now well shaken, in order to obtain a uniformly turbid solution, and half of it (1000 grains measure) transferred to a graduated chlorometer, which is, therefore, thus filled up to 0°, or the zero of the scale, and contains exactly 50 grs. of the chloride of lime under examination; whilst each degree or division of the scale contains only ½ gr.

1000 grains measure of the arsenious acid test-liquor are now poured into a glass beaker, and a few drops of solution of sulphate of indigo added in order to impart a faint but distinct blue colour to it; the glass is then shaken so as to give a circular movement to the liquid, and whilst it is whirling round, the chloride of lime solution from the chlorometer is gradually and cautiously added, until the blue tinge given to the arsenious acid test-liquor is destroyed; care being taken to stir the mixture well during the whole process, and to stop as soon as the decolorisation is completed.

Let us suppose now, that in order to destroy the blue colour of the 1000 grains measure of the arsenious acid test-liquor, 90 divisions or *degrees of the chloride* of lime solution have *been employed.* These 90 divisions, therefore, contained the 10 grs. of chlorine required to destroy the colour of the test-solution; and since each division represents ½ gr. of chloride of lime, 45 grs. of chloride of lime (10 grs. of chlorine) were present in the 90 divisions so employed, from which the per-centage strength may be astertained. For—

45 : 10 : : 100 : 22·22

The chloride of lime examined, therefore, contained 22½ per cent. (nearly) of chlorine.

Obs. This method is extremely simple and trustworthy when properly employed; but to ensure accuracy, certain precautions must be adopted. Instead of pouring the test-liquor into the solution of the sample (as in alkalimetry), the solution of the sample must be poured into the test-liquor.

Another process is that of Dr. Ure, as follows:—Liquor of ammonia, of a known strength, tinged with litmus, is added to a solution of a given weight of the chloride under examination, until the whole of the chlorine is neutralised, which is known by the colour being destroyed. From the quantity of ammonia consumed the strength of the sample is estimated.

CHLO′ROPHYLL. The green colouring matter contained in the leaves, stalks, unripe fruit, and juices of most plants.

CHLORO′SIS. *Syn.* GREEN SICKNESS. A disease which principally affects young unmarried females.

Symp. Langour, listlessness, fatigue after the least exercise, palpitation of the heart, flatulency, indigestion, acidity of stomach and bowels, constipation (generally), appetite for unnatural food, general debility, &c. As the disease advances, the skin, at first pale, assumes a peculiar greenish tint, the respiration becomes affected, the feet and legs swell, and various organic affections of the viscera ensue. During the early stages of this disease the catamenia are usually pale and scanty, and return at irregular intervals, and as it progresses they disappear altogether.

Treat. This should be tonic and restorative. That recommended under ANÆMIA may be adopted with advantage. See also APPETITE, ATROPHY.

CHLO′ROUS ACID. $HClO_2$. *Syn.* ACIDUM CHLORO′SUM, L. *Prep.* From chlorate of potassium, 4 parts; arsenious anhydride, 3 parts; nitric acid, 12 parts; (diluted with) water, 4 parts; heated together in a glass flask, furnished with a bent tube, and placed in a water bath. It must be collected in the same way as chlorine, or passed into water, when it forms a solution of chlorous acid.

Prop., &c. Chlorous acid is a greenish-yellow gas, non-condensable by a freezing mixture of salt and ice, but liquefiable by extreme cold. The aqueous solution undergoes gradual decomposition, yielding chloric acid and chlorine. Chlorous acid possesses powerful *oxidising and bleaching* properties; with the bases it forms salts called CHLOR
are all soluble in water, and bl
acid. They may be recognised by
of chlorous acid gas when acted
The use of the arsenious acid
the nitric acid employed in the
taric acid, or other deodorising
substituted for it.

CHOC′OLATE. *Syn.* CHOCO
CHOCOLLATL, Mexican; CHOCO
beverage or paste made from the
of the *Theobroma Cacao*, or Coc
speaking, the term "chocolate"
to all genuine preparations of co
now generally used to distinguis
contain sugar, and, commonly, fl
stances. Of late years great
been paid to the manufacture of
England; our principal makers
the finest descriptions of cocoa,
varieties of the manufactured arti
scarcely inferior to those of their
The different kinds of cocoa, and
of roasting, sweating, &c., are de
COCOA, to which article we refe
also for particulars respecting the
chocolate.

Prep. The cocoa nibs[1] are gro
consisting of stone or metal rolle
usually heated either by charcoa
steam, so as to soften or melt the
The warm, smooth paste which
the mill is then placed in a mix
incorporated with refined sugar,
vanilla or other flavouring sub
trituration is continued until the
converted into an entirely homog
which is finally shaped, by mean
moulds, into various forms, as
tablets, lozenges, &c.

Obs. Chocolate, prepared as a
the addition of aromatics, is
trade as PLAIN CHOCOLATE. T
flavour it with vanilla, cloves, a
and frequently scent it with m
bergris. With these additions
SPANISH CHOCOLATE. In gene
too large a quantity of the last
The Parisians, on the contrary,
vouring, and that principally
employ the best kinds of cocoa, a
siderable quantity of refined su
pared, it is called FRENCH CHOC

Proportions. 1. FRENCH CHOC
proportions used for the best d
said to be—2 beans of vanilla, a
best refined sugar, to every 3 lbs.
cacao nuts.

2. SPANISH CHOCOLATE:—
forms are said to be commonly
a. Caracas cocoa, 11 lbs.; su
lbs.; vanilla, 1 oz.; cinnamon (
cloves, ½ dr.

---

[1] The bruised, roasted seeds, freed fro
brane.

[2] Cacao- or cocoa-butter.

a, 10 lbs.; sweet almonds, 1
; vanilla, 1½ oz.
a, 8 lbs.; island cocoa, 2 lbs.;
oz.; aromatics, as above.
, 7 lbs.; farina, q. s. to absorb
.

HOCOLATE. *Syn.* CHOCOLAT
Fr. A variety of French or
te highly flavoured with va-
owing proportions have been
-

oa, 7 lbs.; Mexican vanilla, 1
½ oz.; cloves, 3 in no.
late paste, 21 lbs.; vanilla, 4
2 oz.; cloves, ½ dr.; musk, 10

nilla used in making chocolate
powder by rubbing it with a
ore adding it to the paste.
he chocolate commonly sold in
pared from the cake left after
of the oil, and this is frequently
roasted seeds of ground peas,
otato flour, to which a sufficient
ferior brown sugar, or treacle
et, is added to make it adhere
ferior sweet almonds are also
he same way.
above paragraph was written
a vast improvement in English
ugh the cheaper sorts of certain
till much adulterated. Genuine
ld dissolve in the mouth without
d should leave a peculiar sen-
ness; after boiling it with water
should not form a jelly when
does starch or flour is present.
of animal fat may generally be
cheesy or rancid flavour. See

Chocolate is nutritive and whole-
in moderation, but is sometimes
with weak stomachs, especially
re easily affected by oily sub-
etable food. When this is the
ng the simple plan recommended
, chocolate may generally be
punity, even by the dyspeptic.
of aromatics mixed with the
s of chocolate improve the
nder them more stimulant and
se nervous symptoms and head

taken in the solid form, or
beverage; or, combined with
into various articles of con-

FOR THE TABLE is prepared by
aping very finely the required
jug, and adding to it a small
ling water. This is worked into
paste, and the jug immediately
h boiling milk-and-water. A
sed by the same means that
s up. The operation of "*mil-
ed by rapidly twirling a notched* cylinder of wood in the emulsion, raises the froth very quickly. Sugar may be put in with the scraped chocolate, or added afterwards at pleasure.

Chocolate should never be made for the table before it is wanted, because beating it again injures the flavour, destroys the froth, and separates the body of the chocolate, the oil of the nut being observed, after a few minutes' boiling, or even standing long by the fire, to rise to the top. This is one of the principal reasons why chocolate offends the stomach.

Preparations of chocolate, intended either as nutritious articles of food for convalescents, or as vehicles for medicine, are common among the pharmacopœial and magistral formulæ of the Continent. The following are a few examples:—

Chocolate, Aromat'ic. *Prep.* (Weiglebt.) Cocoa beans and sugar, of each 16 oz.; cinnamon, ½ oz.; cloves 2 drs.; cardamoms and vanilla, of each, 1 dr.

Chocolate, Car'rageen. See WHITE CHOCOLATE (Nos. 1 and 2).

Chocolate, Chalyb'eate. *Syn.* FERRUGIN'EOUS CHOCOLATE; CHOCOLA'TA CHALYBEA'TA, C. MAR'TIS, L. *Prep.* 1. (Trousseau.) Spanish chocolate, 16 oz.; carbonate of iron, ½ oz.; mix, and divide into 1-oz. cakes. One at a time; in anæmia, amenorrhœa, chlorosis, &c.

2. (Pierquin.) Iodide of iron, 2 drs.; chocolate, 16 oz. For ½-oz. cakes; as above, and in scrofulous and glandular affections.

Chocolate, Guarana'. *Syn.* PAULLIN'IA CHOCOLATE; CHOCOLA'TA PAULLIN'IÆ, C. GUARAN'Æ, L. *Prep.* From guarana and white sugar, of each, 1 oz., triturated together, and afterwards thoroughly mixed with good plain chocolate, 18 oz. Recommended as a restorative in debility, chlorosis, and other diseases of debility, especially those of a nervous character.

Chocolate, Ice'land Moss. *Syn.* CHOCOLA'TA CETRAR'IÆ ISLAND'ICÆ, C. LICHEN'IS, L. *Prep.* 1. (P.C.) Simple chocolate (P.C.), 32 parts; sugar, 29 parts; dried jelly of Iceland moss, 11 parts; mix.

2. (Cadet.) Chocolate, 4 lbs.; sugar, 2 lbs.; Iceland moss (freed from its bitter, and powdered), 1½ lb.; tragacanth and cinnamon, of each, 4 oz.; water, q. s.; to be beaten in a warm mortar, or ground with a muller on a warm slab to a paste. Recommended in pulmonary affections, general debility, weakness of stomach, &c. See COCOA (Iceland Moss).

Chocolate, Pur'gative. *Syn* CHOCOLA'TA PUR'GANS, C. CATHAR'TICA, L. *Prep.* 1. Jalap, 1 oz.; chocolate, 9 oz.; mix, and divide into 1-dr. cakes.—*Dose.* 1 to 2 cakes, as a purge.

2. Jalap, 2 oz.; calomel and sugar, of each, 1 oz.; triturate together, then add chocolate, 20 oz.; for 1-dr. cakes.

3. Scammony, 2 drs.; chocolate, 3 oz.; for *1 dozen cakes.* The last two are given in worms.—*Dose* (for an adult). 1 cake, taken fasting.

Chocolate, Sal'ep. *Syn.* SAL'OOP CHOCOLATE; CHOCOLA'TA CUM SAL'EP, L. *Prep.* 1. (P.C.) Chocolate, 16 oz.; powdered salep, ½ oz.

2. (Cadet.) Cacao paste and sugar, of each, 1 lb.; powdered salep, 1 oz. Arrowroot chocolate and tapioca chocolate are made in the same manner. (See *below*.)

Chocolate, Sim'ple. *Syn.* HYGIEN'IC C., HOMŒOPATH'IC C.; CHOCOLA'TA, C. SIM'PLEX, C. SALU'TIS, L.; CHOCOLAT DE SANTÉ, Fr. *Prep.* (P.C.) Caracas and Maragnan cocoa, of each, 96 lbs.; sugar, 160 lbs.; cinnamon, 1 oz. (to 2 oz.); triturated together in the usual manner, and formed into cakes or powder.

Chocolate, Vanil'la. *Syn.* CHOCOLA'TA CUM VANIL'LA, L. *Prep.* 1. (P.C.) Chocolate (plain,—P.C.), 16 oz.; vanilla, ½ dr.

2. (Cotterau.) Cocoa paste, 6 lbs.; sugar, 10 lbs.; vanilla, 11 drs.

See forms previously given.

Chocolate, Ver'mifuge. *Syn.* CHOCOLA'TA VERMIFU'GA, L. See PURGATIVE CHOCOLATE (Nos. 2 and 5, *above*).

Chocolate, White. *Syn.* WHITE COCOA, CAR'RAGEEN C.; CHOCOLA'TA CUM CHON'DRO, PAS'TA CACA'O CUM CHON'DRO, P. C. C. LICHEN'E CARRAGHEN'O, L. *Prep.* 1. As Iceland moss chocolate, but employing carrageen moss.

2. (Ph. Dan.) Roasted and decorticated cocoa seeds (reduced to a subtile mass in a warm iron mortar) and powdered white sugar, of each, 2 lbs.; powdered carrageen (debitterised), 3 oz.

3. (Cottereau.) Sugar, 6 lbs.; rice flour, 1¾ lb.; potato starch and butter of cocoa, of each, ¼ lb.; gum arabic ¼ lb. (dissolved); tincture of vanilla, ½ fl. oz.; boiling water, q. s.; triturate to a stiff paste. The above are highly nutritious, and are recommended as articles of diet for convalescents and debilitated persons.

CHOKE-DAMP. *Syn.* AFT'ER-DAMP. The term applied by miners to carbonic anhydride (carbonic acid) and other irrespirable gases and vapours evolved in mines. See CARBONIC ACID, FIRE DAMP, VENTILATION, &c.

CHOLAL'IC ACID. $C_{24}H_{40}O_5$. *Syn.* CHOL'IC ACID.[1] A non-nitrogenous acid existing in bile. It is best prepared by boiling the resinous mass precipitated by ether from an alcoholic solution of ox bile with a dilute solution of potassa, for 24 to 36 hours, till the amorphous potassa-salt that has separated begins to crystallise. The dark-coloured soft mass is then removed from the alkaline liquid, dissolved in water, and hydrochloric acid added. A little ether will cause the deposition of the CHOLALIC ACID from this solution in crystals. With sulphuric acid and solution of sugar, it strikes a purple-violet colour; this constitutes Pettenkofer's test for bile.

CHOLE'IC ACID. *Syn.* TAURO-CHOLAL'IC
ACID. A peculiar conjugated
cholalic acid with a substance
which contains both nitrogen and
combination with soda, choleic a
a principal ingredient in *bile*.

CHOL'ERA. This word, which
rivation, can be only applied
bilious affection of the stomach
has been of late years very loo
to a malignant disease, the most
racteristic of which is a total su
functions of the biliary organs.

Cholera, En"glish. *Syn.* COM'
BIL'IOUS C.; CHOL'ERA MOR'BUS,
characterised by bilious vomiting
accompanied by more or less pain
Diarrhœa is the most common
the disease, and ought to be atte
out delay, particularly if the weat
Cholera most frequently occurs
end of the summer and early in
when the increased heat of the
the liver to an inordinate secreti
which the whole system becom
with it. Among secondary a
causes, are sudden changes of
checked perspiration, and the u
tible food, and food and beverage
incipient decomposition. It is u
panied by fever, thirst and seve
sometimes, by cold sweats, extr
feeble pulse, &c., under which the
in 24 hours.

Treat. In most cases this co
dangerous, and yields to proper t
few days. As soon after the co
of the attack as possible, some
should be administered. Opiates
ployed, both topically and by
Jeremie's solution is stated to
cious in the diarrhœa which so g
cedes cholera. A teaspoonful o
danum, rubbed over the region of
and bowels, is a simple applicati
generally allay the pain. 10 to
laudanum, mixed with a table-spo
brandy, or a few grains of cayenne
also be taken every hour, if the p
Should the stomach reject the
the vomiting be apparently increa
ing warm diluents, a few spoonfu
water, or of a mixture of lem
water, may be taken instead, u
ness abates. Dr. Copeland recom
of turpentine in violent attacks
nally and as an external appli
form of warm epithems. When
of the symptoms has abated, to
ters (as calumba, gentian, oran
may be advantageously had
Calumba, in the form of a weak
joined, if necessary, with arom
haps, the most valuable agent
for the after-treatment of the
DIARRHŒA.

Cholera, Malig'nant. *Syn.*

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[1] This name is generally applied to another compound. See CHOLIC ACID.

essence, from 5 to 10 or 20 drops; in a little camphor julep or plain water. The physicians of Moscow and St. Petersburg ascribe to the virtues of this drug the saving of thousands of lives during the last epidemic. See SUMBUL.

13. (Dr. Stevens's Saline Powders.) Bicarbonate of soda, ½ dr.; common salt, 20 grs.; chlorate of potassa, 7 grs.; for a dose.

14. (Sir M. Tierney's Remedy.) Cajeput oil, in doses of 20 to 30 drops, every two or three hours. The oil excites the nervous system and equalises the circulation. The late Sir M. Tierney and others prescribed it frequently, it is said with considerable success.

15. (Common Remedies of the Shops.) These generally consist of chalk mixture, with a little laudanum, and some aromatic or carminative, as cassia, cinnamon, cardamoms, nutmeg, or peppermint. In a few, some astringent, as tincture of catechu, or extract of logwood, is added.

CHOLES'TERIN. $C_{26}CH_{44}O . H_2O$. This substance is found in the bile, brain, nerves, blood, &c., and forms the principal ingredient of biliary calculi (*gall-stones*).

Note.—The remedies containing astringents are the most efficacious.

CHOL'IC ACID. *Syn.* GLYCO-CHOLAL'IC ACID. A peculiar acid, existing as cholate of sodium, and associated with choleic acid in the bile. It is a conjugate compound of cholalic acid with a nitrogenised substance called glycocin.

CHON'DRIN. Gelatin obtained from cartilage. It differs from ordinary gelatin, in being precipitable by acetic acid, alum, and acetate of lead.

CHRO'MATE. *Syn.* CHRO'MAS, L. A salt in which the hydrogen of (hypothetical) chromic acid, $HCrO_2$, is replaced by a metal or other basic radical.

Chromates:—

Prep. The insoluble chromates, as those of barium, zinc, lead, mercury, silver, &c., may be made by mixing a soluble salt of those bases with neutral chromate of potassium. The first three are yellow; the fourth, brick-red; and the fifth, reddish-brown, or ruby red when crystallised. The soluble chromates may all be made by direct solution of the base in the acid, or by double decomposition. The chromates of commerce are prepared from either chrome ore or chromate of potassium.

Prop., Uses, &c. The chromates are characterised by their yellow or red colour, the latter predominating when the acid is in excess; and except those with the alkaline bases, they are, for the most part, insoluble in water. Both the chromate and the bichromate of potassium are extensively used in dyeing and calico-printing. The former is employed in conjunction with sulphuric acid in the laboratory as an oxidising agent, and in the manufactory for bleaching sperm oil. The bichromate of ammonium and potassium are used in photography.

They are readily recognised by the following *tests*:—

On boiling a chromate in hydro mixed with alcohol, chromic acid free, and then decomposed, formi solution of chloride of chromium retted hydrogen and sulphurous similar changes. With acetate chromates give a yellow precip nitrate of silver, a reddish-brown; of mercury, a red one.

CHROME ALUM. See ALUMS.

CHROME GREEN. See GREEN

CHROME RED. See RED PIG

CHROME YELLOW. See CH LEAD.

CHROMIC ACID. See CHRO DRIDE.

CHRO'MIUM. Cr. A metal d native chromate of lead by Vauqu It is found in the state of oxid with oxide of iron, in some abun Shetland Islands, and elsewhere; of lead, it constitutes a very beauti

Prepared in an impure conditio very infusible, hard metal, by i oxide with charcoal, at a white he crucible.

Chromous Chloride. $CrCl_2$. *Syn.* RIDE. *Prep.* Ignite the chromic current of dry hydrogen. A wl mass, soluble in water (evolving and yielding a blue solution, wl atmospheric oxygen with astonishi acquiring a deep-green colour, and the state of oxychloride of chro the most powerful reducing or agent known.

Chromic Chloride. Cr_2Cl_6. S CHLORIDE. *Prep.* Pass dry chl mixture of sesquioxide of chromiu coal, heated to redness, in a po The chloride collects as a sublimat or violet colour, in the cool part o

Dissolve chromic oxide in hydr and evaporate to dryness; th chromic chloride. It forms a dark containing water, which is evolve at a temperature of 400°, turnin red.

Chromium Oxides:—

Chromous Oxide. CrO. *Syn.* OF CHROMIUM. This oxide has obtained in a satisfactory manner drate is prepared by the addition hydrate solution to a solution chloride or sulphate. A brown der, speedily passing to a deep f disengagement of hydrogen, and blue-coloured salts with the aci sorb oxygen with avidity, whil passes into a higher state of oxid

Chromic Oxide. Cr_2O_3. *Syn.* Prepared by igniting potassium a red heat and well washing the as hydrate by cautiously adding hydrochloric acid and alcohol o boiling solution of chromate of po vity, is the richest in sugar, ferments the most freely, clarifies spontaneously the quickest, and keeps the best after fermentation. They contain a minute quantity of extractive matter which is not present in other apples. The juice of sweet apples ferments tumultuously, clears with difficulty, and the resulting cider does not keep so well as that produced from the first variety. The juice of sour apples contains less sugar and more acid than the other two, and consequently, not only produces the weakest, but the worst cider; it, however, "fines" well, although it "stores" badly. Sour and "rough-tasted" apples are usually preferred by farmers for making cider. This preference, which is very decided in the West of England, may be readily accounted for. The sour and rough-tasted apples contain less sugar, and more malic acid, than some of the other varieties, and the presence of this acid impedes the conversion of the alcohol of the cider into vinegar; a change which their rude mode of operating renders otherwise inevitable. But cider made with such apples never equals in quality that prepared at a low temperature, from fruit abounding in sugar, provided equal skill is exercised in the manufacture as in the process of converting malt-worts into beer.

The process of making cider varies in different places, but in every case essentially consists of the collection of the fruit, the expression and fermentation of the juice, and the storing and management of the fermented liquor.

The collection of the fruit should not be commenced before it has become sufficiently mature, and should be performed with greater care than is commonly bestowed upon it. The apples, after being gathered, are usually left for 14 or 15 days in a barn or loft, to mellow, during which time a considerable portion of the mucilage is decomposed, and alcohol and carbonic acid developed. If this "ripening" is allowed to go too far, loss arises, notwithstanding the vulgar prejudice in its favour. The spoiled apples are then separated from the sound ones, as they not only impart a bad flavour to the cider, but impede its spontaneous clarification.

The expression of the juice is the next step in the process of cider-making. The apples are crushed or ground in mills consisting of two fluted cylinders of hard wood or cast iron, working against each other. The common practice is next to sprinkle the pulp with ⅛th to ¼th of its weight of spring or river water, and then to allow it to remain in tubs or wooden cisterns for 12 or 14 hours, during which time incipient fermentation commences, and the breaking up of the cells of the membrane takes place, by which the subsequent separation of the juice is facilitated. This plan, though general among cider manufacturers, is prejudicial to the quality of the future liquor; as not only is a portion of the newly *formed alcohol lost*, but the skins and pips

often impart to it a disagreeal
employing more efficient crush
this system of vatting is render
cessary. A machine furnished
ing circular rasp, similar to th
ing potato starch, is admirably
purpose.

The pulp of the crushed or
now placed on a kind of wic
hair-cloth or coarse canvas
being allowed to drain into
receivers, is subjected to pow
gradually applied, in the ci
liquor which runs off first is
usually kept separately; whi
follows, especially the portio
much pressure, tastes of the "

The expressed juice or mu
above, is next put into clean
bung-holes, and freely expose
the shade, where they are place
with flat tubs under them to
They are now constantly att
kept quite full, in order that
forms, may froth over and be
the surface of the liquor. Aft
for weak cider, and 8 or 10
cider, or as soon as the sedimen
the liquor is "racked off" in
which have been (according
practice) previously sulphured
match. The casks containin
cider" are then stored in a cell
or other cool place, where a
temperature can be ensured,
mature or ripen. By the follo
cider is commonly fit for us
"re-racked" for sale.

The marc, or pressed pulp, is
sprinkled with ⅓ or ¼ its weigh
re-pressed. The resulting li
mented, forms a weak kind
moil, water moil), which is
mestic use in the same wa
The refuse-pulp (apple marc, po
apple cheese) is used as food fo
cattle, and is very acceptable

The storing and managem
matters of vast importance to
the factor, the wholesale deale
tler. The principles by which
directed are precisely similar
are explained under the heads
MENTATION, and MALT LIQU
indeed, refer, with slight mod
fermented liquors.

Preparatory to bottling cid
examined, to see whether
sparkling. If not so, it shoul
a similar way to beer, and left
The night before it is intend
bottles, the bung should be t
cask, and left so until the ne
filled bottles should not be co
the day after; as, if this is do
of the bottles will burst by

alone be used. Champagne
ariety generally chosen for
to wire down the corks, and
h tinfoil, after the manner of
w bottles at a time may be
place to ripen. When the
r immediate use, or for con-
the cooler portion of the
e of lump sugar may be put
efore corking it; or, what is
in effect, the bottles may be
r 3 hours after being filled.
or long keeping, this practice
missible. The bottled stock
l in a cool cellar, when the
greatly improved by age.
g should be of good quality,
ant, and at least a twelve-
en out of condition it is unfit

ider, when of good quality,
ondition, is doubtless a very
r. Cider consumers, living in
ts, appear to enjoy almost an
cholera, and often from other
are common in other parts of
At the same time, however, it
tion, that the dry colic or belly-
ctonum) is far from uncommon
cts, but is wholly confined to
k early, hard, or inferior cider,
sh, unripe fruit. We believe
ases, it may be referred to the
mon cider having acted on the
or copper of the articles or
which it has come in contact,
it has dissolved a very minute
best cider contains from $8\frac{0}{0}$ to
te alcohol; ordinary cider, from

remarks. Much of the ex-
ler depends upon the tempera-
the fermentation is conducted; a
verlooked by the manufacturers
Instead of the apple-juice, as
expressed from the fruit, being
ol situation, where the tempe-
not exceed 50° or 52° Fahr., it
eft exposed to the full heat of
this way much of the alcohol
decomposition of the sugar is
vinegar, by the absorption of
ygen, and thus the liquor ac-
uliar and unwholesome acidity,
cider districts by the name of
When, on the contrary, the
is conducted at a low tempe-
the whole of the sugar is con-
cohol, and this remains in the
of undergoing the process of
The acetous fermentation, by
is converted into vinegar, pro-
idly at a temperature of about
d at lower temperatures, the
s gradually slower, *until at 46°*
no such change takes place.

(Liebig.) It is therefore evident, that if the saccharine juice of apples, or any other fruit, is made to undergo the vinous fermentation in a cool situation, less of the spirit resulting from the transformation of the sugar, will be converted into acetic acid, and, consequently, more will be retained in an unaltered state in the liquor, to improve its quality, and by its conservative and chemical action, to preserve it from future change. This is the principal cause, other circumstances being alike, of the difference in the quality of the cider made by persons living in the same district. The one has probably a cooler barn and cellar than the other, to store his liquor in, and is more careful to keep the pulp and juice cool during the early part of the process. In Devonshire, the pressing and fermentation are conducted in situations where the temperature varies little from that of the external air, and fluctuates with all its changes; the result is, that Devonshire cider, of the best class, will rarely keep more than 4 or 5 years, and seldom improves after the second or third year; whilst the cider of Herefordshire and Worcestershire, where these operations are more carefully attended to, will keep for 20 or 30 years.

When the pressing the apples for the juice is deferred until late in the season, it sometimes happens that the fermentation is sluggish. Though the juice has been set on the old system, in November or December, the working hardly commences until March. At this time the cider is sweet; it now rapidly becomes pungent and vinous, and is soon ready to be racked for use. If the fermentation still continues, it is again racked into a clean cask that has been sulphured; or, two or three cans of the cider are put into a cask, and a brimstone-match burned in it. The cask is then agitated, after which it is nearly filled with the cider. By this process the fermentation is checked, and the cider in a short time becomes fine. Great care must be taken that the sulphuring be not overdone, as it is apt to impart a slightly unpleasant flavour to the liquor. If, on the first operation, the fermentation is not checked, the process of 'racking' is repeated, until the liquor becomes clear, and is continued from time to time, till the cider is in a quiet state, and fit for drinking.

A common practice in Devonshire is to add a stuff called 'stum,' sold by the wine-coopers, or an article called 'antiferment,' sold by the druggists, for the purpose of checking the fermentation, but a much better plan is that described above.

To improve the flavour of weak cider, or to render ordinary cider more vinous, various plans are followed by the cellarmen and bottlers. An excellent one is to add to each hogshead $1\frac{1}{2}$ gal. of good brandy or rum, with 2 oz. of powdered catechu (dissolved in water), 10 lbs. of good moist sugar or honey, $\frac{1}{2}$ oz. each of bitter almonds and cloves, and 4 oz. of mustard seed (all in powder). These must be well 'rummaged' into the liquor, and the whole occasionally stirred up for a fortnight, after which it must be allowed to repose for 3 or 4 months, when it will usually be found perfectly 'bright,' and no bad substitute for foreign wine. Should this not be the case, the liquor must be 'fined' with a pint of isinglass finings, or a dozen eggs, and allowed to rest for a fortnight. If the cider is preferred pale, the catechu must be omitted, and instead of isinglass, a quart of skimmed milk is to be used as 'finings.' When desired of a pinkish tint, 1 oz. of cochineal (in powder) may be added, instead of the catechu.

About 18 cwt. of November apples commonly yield one hogshead of cider. In Devonshire, about 6 sacks or 24 bushels are the common quantity for the hogshead of 63 galls.

The best cider made at the present day is that of Normandy, Herefordshire, and New Jersey (U. S.), and next that of Devonshire and Somersetshire. See ANTIFERMENT, FERMENTATION, &c.

Cider, Champagne. This name is given in the United States of America to a fine, pale variety of cider, much used for bottling, which has a great resemblance to inferior champagne. The best variety comes from New Jersey. The name is also applied in this country in a similar manner. The following is a good form for a 'made' cider of this class:—

Prep. Good pale vinous cider, 1 hhd.; proof spirit (pale), 3 galls.; honey or sugar, 14 lbs.; mix well, and let them remain together in a temperate situation for 1 month; then add orange-flower water, 3 pints; and in a few days fine it down with skimmed milk, ½ gal. A similar article, bottled in champagne bottles, silvered, and labelled, is often sold to the ignorant for champagne.

Cider, Made. An article under this name is made in Devonshire, chiefly for the supply of the London market, it having been found that the ordinary cider will not stand a voyage to the metropolis without some preparation. The finest quality of 'made' cider is simply ordinary cider racked into clean and well-sulphured casks; but the mass of that which is sent to London is mixed with water, treacle, and alum. The cider sold in London under the name of Devonshire cider, would be rejected even by the farmers' servants in that county.

Cider, Rai'sin. This is made in a similar way to raisin wine, but without employing sugar, and with only 2 lbs. of raisins to the gal., or even more, of water. It is usually fit for bottling in 10 days, and in a week longer is ready for use.

Ci'derkin. *Syn.* CIDER MOIL. See *above.*

CIDER SPIRIT. See BRANDY.

CIGAR'. *Syn.* SEGAR'; CIGARRE, Fr.; CIGARRO, Span. A small roll of tobacco-leaf *used for smoking.* The leaf is stalked or *stripped of its* midrib, and damped before it passes into the hands of the cigar-
envelope or skin is cut from a
broken leaf, and is quickly rolled
cient tobacco to form the inside.
the loose end of the envelope a
of paste, coloured brown with
generally used. Only those w
great practice can make cigars of
A full account of the manufact
does not come within the scope
Although cigars of British make
pete in point of flavour with
factured in tobacco-growing co
have obtained a high degree of
the excellent manner in which th
and from their comparative ch
information respecting the adv
cigars, and the influence of th
health, see TOBACCO.

CIGARS'. (In *pharmacy.*)
CATED CIGARS, M. CIGARETTES'.
nistration of medicinal agents in
cigars, is of recent introduction,
only very limited use. The m
stance, if of a suitable descrip
leaves of plants, is made up int
like cheroots, and then smoked
manner. In some cases, comm
paper cigars (cigarettes), are m
moistening them in a preparation
to be administered. When the
perty of the tobacco would prove
is first exhausted by soaking and
water.

Cigars, Aromat'ic. *Syn.* AROM
ETTES; CIGARETT'Æ AROMAT'ICÆ,
ETTES AROMATIQUES, Fr. Aro
lavender flowers, &c., made int
Smoked for their odour; and in
face-ache, &c. See SCENTED CIG

Cigars, Arsen'ical. *Syn.* C
SENICA'LES, L. *Prep.* Dissolve
soda, 1 part, in water, 30 parts
unsized paper into the solution, an
small rolls, 3 or 4 inches long.
monary consumption; 4 or 5 wh
times a day.

Cigars, Balsam'ic. *Syn.* BAL
ETTES; CIGARR'Æ BALSAM'ICÆ,
B., L. Thick, unsized paper is
solution of saltpetre, and dried;
is brushed over first with tincture
and when again nearly dry, wi
tincture of benzoin; in about ha
is cut into pieces (1½ × 4 inche
into cigarettes. *Used* in hoars
voice, asthma, &c.

Cigars, Belladonn'a. *Syn.* BE
GARETTES; CIGARETT'Æ BELL
Prep. 1. Belladonna leaves mad
ettes of 1 dr. each.

2. (Compound—C. B. COMPOS
belladonna leaves, 4 parts; mo
tincture of opium (Ph. L.), 1 par
made into 1 dr. cigarettes, as bef
Used as an anodyne and anti

ghs, hooping-cough, tooth-
tic douloureux, &c.

or. *Syn.* CAMPHOR CIGAR-
r'Æ CAMPHO'RÆ, L.; CIGAR-
RE, Fr. *Prep.* 1. Bibulous
with 2 or 3 drops of essence
rolled into cigarettes. For
ely placed in a tubular cigar-

These are made by loosely
large straw with small frag-
r, closing the open end with
wool or bibulous paper, and
sed end with a pin, to allow
r.

he above are used unlighted,
air through them into the
then becomes very slightly
e vapour of camphor. In cold
aporisation is promoted by
rette for a few minutes in the
he homœopathists regard them
of cholera, and the common
m to possess the same virtue
contagious diseases generally,
yphus and scarlet fever. They
mployed oftener than 3 or 4

bane. *Syn.* CIGARR'Æ HYOS-
rom henbane leaves, as directed
ONA CIGARS.

r''rial. *Syn.* CIGARR'Æ MER-
Prep. (Paul Bernard.) Ordi-
re deprived of their narcotic
soaking them in water, and are
ith a weak solution of corrosive
which a little opium is generally
proportion may be, of corrosive
gr.; rectified spirit, 20 drops;
laudanum, 15 drops; with this
rs are to be equally moistened
at 1½ inch of the mouth end,
side to dry.

ersons afflicted with syphilitic
the throat and palate, as a con-
d of mercurial fumigation. For
ed to the use of tobacco, mild
ived of their nicotine, may be
he purpose.

t'ed. *Syn.* PERFU''MED CIGARS;
OMAT'ICÆ, L. *Prep.* 1. By
inary cigars with a strong tinc-
la, to which a little gum benzoin
be added. Some persons add
ity of camphor, or of oil of

ng the tobacco, of which the
e made, or the cigars themselves,
e, in a very strong infusion of
then allowing them to dry by a
t.

inserting very small shreds of
between the leaves of the cigar,
made for the purpose.

above yield a very agreeable
oked; but are said to intoxi-
cate quicker than unprepared cigars of equal strength and quality. They lose much of their fragrance by age.

Cigars, Stramo''nium. *Syn.* DATU'RA CIGARS; CIGARRÆ STRAMO''NII, L. From the leaves of *Datura stramonium*, or preferably those of the eastern species, *Datura tatula*. See ASTHMA, DATURA.

CINCHONA.
CINCHONICINE.
CINCHONIDINE.
CINCHONINE.
} See QUINIA.

CINCHOVATINE. *Syn.* CINCHOVINE. See Appendix.

CINNAMEIN. $C_{16}H_{14}O_2$. *Syn.* OIL OF BALSAM OF PERU. A volatile oil existing in balsam of Peru.

CINNAMIC ACID. $HC_9H_7O_2$. A colourless, transparent, crystalline substance, obtained from oil of cinnamon, liquid storax, balsam of Peru, and balsam of tolu. It is freely dissolved by alcohol, but nearly insoluble in water. At 248° Fahr. it fuses, and at 560° Fahr. it sublimes unchanged. Distilled with dichromate of potassium and sulphuric acid, it is converted into benzoic acid. Its salts are called cinnamates.

CINNAMON. *Syn.* CINNAMON BARK; CINNAMOMI CORTEX (B. P.), L. The inner bark of shoots from the truncated stock of the *Cinnamomum Zeylanicum*, imported from Ceylon, and distinguished in commerce as Ceylon cinnamon. The best is obtained from branches about three years old.

Used in *medicine* as a carminative and astringent, chiefly as an adjuvant to other medicines, *e.g.* with chalk, in diarrhœa.

Dose. 10 to 20 grains.

Obs. Owing to the high price of this drug, it has become a general practice to substitute the bark of cassia (*Cassia; Cortex cinnamomi cassia*) for it, which so closely resembles it in flavour that the uninitiated regard them as the same. Cassia, however, is not only thicker and coarser than cinnamon, but its fracture is short and resinous, and its flavour is more biting and hot, whilst it lacks the peculiar sweetish taste of cinnamon. The thickness of cinnamon seldom exceeds that of good drawing paper.

CITRATE. A salt in which the hydrogen of citric acid is replaced by a metal or other basic radical.

CIT'RIC ACID. $H_3C_6H_5O_7$. *Syn.* ACID OF LEMONS, CONCRETE A. OF L.; AC'IDUM LIMO'NIS, ACIDUM CIT'RICUM (B.P.), L.; ACIDE CITRIQUE, Fr.; CITRONENSAÜRE, Ger. An acid peculiar to the vegetable kingdom. It is obtained in large quantity from the juice of lemons, and other fruits of the genus *Citrus*; it is found in gooseberries, currants, &c., in conjunction with malic acid.

Prep. The citric acid manufacture consists in separating it from the mucilage, sugar, and *other foreign matter* with which it is combined *in the juice of lemons* and limes.

1. (Ph. L. 1836,—Scheele's process.) Take of lemon juice, 4 pints; prepared chalk, 4½ oz.; diluted sulphuric acid, 27½ fl. oz.; distilled water, 2 pints. Add the chalk by degrees to the lemon juice, made hot, and mix well; set by, that the powder may subside, and, afterwards, pour off the supernatant liquor. Wash the precipitated citrate of lime frequently with warm water; then pour upon it the diluted sulphuric acid, mixed with the distilled water, and boil the whole for 15 minutes, in glass, stoneware, or lead; press the mixture strongly through a linen cloth, and filter it. Evaporate the filtered liquor with a gentle heat, and set it aside, that crystals may form. To obtain the crystals pure, dissolve them in water a second and a third time; filter each solution, evaporate, and set it apart to crystallise.

2. (Ph. L. 1851.) Merely placed in the materia medica.

3. (Ph. E. 1841.) Similar to that of Ph. L. 1836, except that the washed citrate of lime is ordered to be squeezed in a powerful press, and that the filtered solution of citric acid is ordered to be tested with nitrate of baryta, and if the precipitate is not nearly all soluble in nitric acid, to add a little citrate of lime to the whole liquor, till it stands this test.

4. (Ph. D. 1826.) Same as that of Ph. L. 1836.

5. (Ph. D. 1851.) Included in the materia medica.

6. (Dr. Price.) The crude juice is saturated with ammonia, potassa, or soda (carbonates), or with the ammoniacal product distilled from gas liquor; chalk 150 parts, or hydrate of lime, 90 parts, are then added for every 192 parts of citric acid contained in the liquor, and the whole stirred well together; heat is next applied, and the ammonia distilled into another quantity of lemon juice; the citrate of lime thus obtained is then decomposed with dilute sulphuric acid, and the whole process conducted as before. When potassa or soda is used, the distillation is omitted, and the expressed liquor, after filtration, used to decompose fresh lemon juice.

7. (Ordinary manufacturing process.) To crude lemon or lime juice, mixed with water, is added ground chalk; the precipitate is washed to free it from the impurities dissolved in the water, and afterwards decomposed by sulphuric acid. If the citric acid is not sufficiently white, it is decolorised by digestion with animal black.

Obs. If the lemon or lime juice be allowed to ferment a short time, the mucilage and other impurities will, to a certain extent, separate and subside. See *Concluding remarks.*

Prop., Uses, &c. Citric acid forms rhomboidal prisms, which are clear colourless, odourless, sour, and deliquescent in a moist atmosphere. It is an agreeable acid, at once cooling and antiseptic. It is much used in medicine as a substitute for lemon juice, and to form effervescing draughts, &c.

17 grs. citric acid, in crystals, or ½
lemon juice,

are equivalent to

25 grs. bicarbonate of potash;
20 „ carbonate of potash;
15 „ carbonate of ammonia;
20 „ bicarbonate of soda;
35 „ carbonate of soda.

The bicarbonate of potassa is that
preferred for making saline drau
citric acid; and when flavoured wit
tincture of orange peel and simple
syrup of orange peel alone, it form
delicious effervescing beverage. C
in pure crystals or in lime juice is
by the calico-printer, being the bes
'resistant' for iron and alumina mor

Pur. Citric acid is frequently
adulterated with tartaric acid; the
easily detected by dissolving the
little cold water, and adding to the
small quantity of acetate of potassa.
taric acid be present, a white, crystall
cipitate of cream of tartar will be prod
agitation. When pure, it is devoid o
is entirely, or almost entirely, dec
by heat. It is soluble in water and i
and what is thrown down from its
solution by acetate of lead, is diss
nitric acid. No salt of potassium pre
anything with citric acid except the
When a few drops of a solution of ci
are added to lime water, a clear liqui
which, when heated, deposits a white
soluble in acids without effervescence.
action of nitric acid, citric acid is c
into oxalic acid.

Estim. See ACIDIMETRY and LIM

Tests. See *above.*

Concluding remarks. The prepa
citric acid has now become an i
branch of chemical manufacture,
large consumption of this article i
operations in the arts. In condu
different steps of the process so
expertness and care are, however,
to ensure success. The chalk employ
should be dry, and in fine powder, is
the juice, from a weighed sample,
latter is perfectly neutralised, and th
consumed is exactly noted. The pr
citrate of lime is next thoroughly wa
water, and the sulphuric acid, dilut
or 8 times its weight of water, w
warm, is poured upon it, and t
mixed with it. The agitation is co
renewed for 8 or 10 hours or longer,
solution of citric acid is poured of
residuum of sulphate of lime thorough
with warm water, the washings be
to the liquid acid. This last is th
off from the impurities that may

porated in a leaden boiler,
, or by high-pressure steam,
ie gravity of 1·13, when the
d, at a lower temperature,
pect is assumed, and a pel-
the surface of the liquor.
re at this part of the pro-
tch may be carbonised and
point the concentrated solu-
to warm and clean crystal-
in a dry apartment, where
does not fall below temper-
of 4 days the crystals are
emoval from the pans. They
ained, redissolved in as little
and after being allowed to
hours to deposit impurities,
and crystallised.
the second crystallisation is
ly pure for the market; when
se, a third, or even a fourth
ust be had recourse to. The
rom the several pans are now
r, and a second or third crop
ined from them, by evapora-

use of difficulty in obtaining
e solutions, is the employment
lphuric acid to decompose the
rate of lime; the consequence
t a little of that salt is taken up
tric acid, and materially ob-
stallisation. 40 parts of dry
are required to decompose 50
. Commercial sulphuric acid
is usually of the sp. gr. of 1·845,
re requires 49 lbs. of this acid
lbs. of chalk employed in the
ractice, it is found that a very
of sulphuric acid is preferable
rance of undecomposed citrate of

op of crystals is called 'brown
nd is chiefly sold to the calico-
etimes a little nitric acid is added
n of the coloured crystals, for the
itening them, but in this way a
ity of oxalic acid is formed. A
plan is to bleach the citrate of
ing it in shallow vessels to the
overed with a weak solution of
e, and to re-wash it before de-
with the sulphuric acid. A safer
olve the crude citric acid, digest
charcoal, and again concentrate
o the crystallising point.
juice yields about 6½% of crys-
acid; 2 galls. yield fully 1 lb.
See LEMON JUICE, LIME JUICE,

The fruit of the citron tree
s) is acidulous, antiseptic, and
it excites the appetite, and
s; and, like lemon juice, has
extolled in *chronic rheumatism*,
ry. *Mixed with cordials*, it is used as an antidote to the manchineel poison.

Citron, Oil of. See OIL.

Citron Peel. This is prepared in the same way as candied orange and lemon peel, which it for the most part resembles.

Citron. *Syn.* LEM'ON COLOUR. The term applied to a pale and delicate shade of yellow. See YELLOW DYES, &c.

CIT'RONELLE. See LIQUEURS and OILS (Lemon-grass).

CITRUS. A genus of plants belonging to the natural order *Aurantiaceæ*, the species of which yield useful fruits. From *Citrus Aurantium*, and its varieties, all the various descriptions of sweet oranges are obtained. The species *C. Bigaradia* or *vulgaris* yields the bitter or Seville orange; *C. Limonum*, and its varieties, yield the lemons; *C. Limetta* is the source of the lime; *C. medica*, of the citron; *C. Decumana*, of the shaddock; *C. paradisi*, of the forbidden fruit; *C. Pampelmos*, of the Pampelmoose; and *C. japonica*, of the kumquat.

Citrus Bergamia. (Ind. Ph.) *Syn.* THE LIME TREE. *Habitat.* Commonly cultivated in India and other tropical countries.—*Officinal part.* The fruit (*lime*) closely resembles the lemon, but is smaller, with a smoother, thinner rind, and of somewhat less fragrant odour. Its juice (*lime juice*) has the same pungent acid taste, and contains the same ingredients, as lemon juice, though in somewhat different proportions, that of the citric acid being larger, and that of the mucilage less in quantity. Much of the article imported into England under the name of lemon juice is obtained from the lime.—*Properties and Uses.* Very similar to those of the lemon, the juice being equally refrigerant and antiscorbutic; indeed, it is preferred by many tropical practitioners.

The fresh juice of the lime is procurable in almost every portion of the tropics, and is considered more effectual than preserved lemon juice.

Lime juice may be advantageously employed in the manufacture of citric acid, the proportion of this acid being larger than in lemon juice.

CIV'ET. *Syn.* CIVET'TA, ZYBETH'UM, L. A perfume, obtained from the civet cat (*Viverra civetta*,—Linn.), a fierce, carnivorous quadruped, somewhat resembling a fox, found in China and the East and West Indies. The civet is secreted in a sort of pouch between the anus and the sexual organs. "Several of these animals have been brought into Holland, and afford a considerable branch of commerce, especially at Amsterdam. The civet is squeezed out in summer every other day, in winter twice a week; the quantity procured at once is from 2 scruples to 1 drachm or more."

Civet is frequently adulterated with spermaceti and butter, and a similar substance to civet, but of a darker colour, obtained from *the polecat. When pure* it has an odour *intermediate* between that of musk and ambergris, but less refined; a pale-yellow colour; an acrid taste; and the consistence of honey. It is used in perfumery.

CLAIRET. See LIQUEUR.

CLAR'ET RAGS. *Syn.* TOURNESOL EN DRAPEAU, Fr.; BEZET'TA CŒRU'LEA, L. 1. Pieces of clean linen coloured with Auvergne —or ground archil.

2. Pieces of linen dipped into the juice of mulberries, blood-red grapes, lees of red wine, &c. *Used* to colour jellies, confectionery, the rind of cheeses, &c.

CLARIFICA'TION. The act of clearing or making bright; commonly applied to the process of 'clearing' or 'fining' liquids by chemical means, instead of by filtration. The substances used for this purpose are popularly known as 'clarifiers' or 'finings.'

The substances employed in the clarification of liquids, operate by either mechanically embracing the feculous matter, and subsiding with it to the bottom of the vessel, or by inducing such a change in its nature or bulk that it subsides by its own density, in each case, leaving the liquor transparent. Albumen, gelatin, the acids, certain salts, blood, lime, plaster of Paris, alum, heat, alcohol, &c., serve in many cases for this purpose. The first is used, under the form of white of egg, for the clarification of syrups, as it combines with the liquid when cold, but on the application of heat rapidly coagulates and rises to the surface, carrying the impurities with it, forming a scum which is easily removed with a skimmer. It is also much used for fining wines and liqueurs, particularly the red wines and more limpid cordials. Gelatin, under the form of isinglass, dissolved in water or weak vinegar, is used to fine white wines, beer, cider, and similar liquors that contain a sufficient quantity of either spirit or astringency (*tannin*), to induce its precipitation. Sulphuric acid is frequently added to weak liquors for a similar purpose, either alone, or after the addition of white of egg or gelatin, both of which it rapidly throws down in an insoluble form. A pernicious practice exists among some unprincipled manufacturers, of using certain salts of lead and potassa to clear their liquors; especially those that are expected to sparkle in the glass, as 'cordial gin,' &c. For this purpose, a little sugar of lead, dissolved in water, is first mixed up with the fluid, and afterwards a little more than ¼ its weight of sulphate of potassa, also dissolved in water, is added, and the liquor is again 'roused' up. By standing, the sulphate of lead, formed by this mixture, subsides, and leaves the liquor clear. Bullock's blood is used in the same way as isinglass or white of eggs, for fining red wines, beer, and porter. Lime, alum, alcohol, the acids, and heat, act by curdling or coagulating the feculencies, and thus, by increasing their density, induce their subsidence. Plaster of Paris acts, partly like the above, and partly
like albumen, or gelatin, l
and forcing down the suspe
Sand is often sifted over liqu
cordials and syrups), for the sim
acting by its gravity, but appe
useless, as it sinks too rapidly.
plants are clarified by heat, wh
the albumen they contain. M
frequently used to clear cider
strip of isinglass is generally
clarify coffee. See WINE, B
DIAL, COFFEE, FININGS, INFUSI

CLAY. Clay is formed fro
gration of felspathic rocks, by
action of air and water. Its p
moist, and its capability of bei
by heat, are properties which re
able for many useful purposes
kind of clay is kaolin, or Chi
consists almost entirely of silicat
It is found in China; but a p
substance is obtained from de
wall and some parts of France.
white clay nearly free from ir
large quantity in the island
Potter's clay is found in m
Britain; that of Devonshire a
is much valued. Brick clay co
proportions of iron; hence the d
of the bricks used in different
ALUMINIUM, FULLER'S-EARTH,

CLEAN'ING. In domestic
best way to clean a house is t
by a daily attention to small t
allow it to get into such a sta
and disorder as to require great
cleanings. Some mistresses,
servants, seem to have an idea
should undergo regular clean
washing and scrubbing match
three or six months, on which
house is turned almost inside
most uncomfortable. All this i
and indicates general slovenli
(Chambers.) For hints upon
CARPETS, CLOTHES, &c.

CLEAN'LINESS. See ABLUT
and SICKNESS.

CLOTHES. Economy and
quire due attention to be paid
of clothing, but more especially
are the most exposed to dirt an
The following remarks, hav
chiefly to woollen articles, ma
to the reader:—If very dusty,
a horse or line, and gently be
cane; then lay them on a
table and well brush them, fi
brush, to remove the spots o
coarsest of the dirt, and next
one, to remove the dust and
properly. If clothes are we
with dirt, dry them before
and then rub out spots with t
hard brush should be used as li
and then with a light hand

antly employed, soon render
are. Spots of tallow-grease
y be taken off with the nail,
t be done, have a hot iron
brown paper, lay the paper
the grease is, then put the
pot; if the grease comes
er, put on another piece, till
it. Moths may be prevented
, by putting a few cloves or
ox or closet with them. See
SCOURING, &c.

In our changeable climate
l be taken to clothe the body
when the skin is chilled, the
ned in increased and injurious
internal organs, causing colds
ms. The ordinary materials
e cotton, linen, woollen, and
generally employed for under-
hich its softness and warmth
adapted. Linen is not nearly
keeps its colour better; it is
, and although it wears much
not so economical as cotton.
ents are, in cold and variable
st essential to comfort; the
ed by wearing flannel next the
eneficial, and the slight stimu-
ising from its roughness tends
in in healthy action.

Syn. CARYOPH'YLLUM (B. P.),
wer-buds of the *Caryophyllus*
Linn.), or clove tree, collected
pe, dried, and smoked. Cloves
, stimulant, carminative, and
nd according to some, possess
erties. They are chiefly used as
in compound medicines. A few
a closet or box prevent moths or
ng furs, woollens, &c.
mon practice to adulterate this
ame manner as cinchona bark.
hich the oil has been distilled,
rubbed between the hands, pre-
sed with a little sweet oil, to
r colour, after which they are
fresh spice for sale.

er of. The unripe fruit of the
ey are frequently imported pre-
ved mother of cloves), and are
chic and antispasmodic.

Syn. O'LEUM CARYOPH'YLLI
his possesses similar virtues to
d flower-buds, and is esteemed
or the tooth-ache. *Used* to fla-
nd confectionery.

See ENEMAS.

varieties of this valuable sub-
conveniently described under
ds ANTHRACITE, LIGNITE, and
ch *see*). See also FUEL.

Syn. REG'ULUS OF COBALT;
A metal discovered by Brandt,
nerally occurs in the *same ore*
the separation of the two metals is a task requiring great patience and expertness. Speiss cobalt and cobalt glance are the ores from which the metal is commonly extracted.

Prep. 1. Dissolve oxide of cobalt in hydrochloric acid, and pass sulphuretted hydrogen gas through the solution, until all the arsenic is thrown down; filter, and boil with a little nitric acid, then add carbonate of potassium, in excess, and digest the precipitate in a solution of oxalic acid, to remove any oxide of iron; wash and dry the residuum (oxalate of cobalt), and expose it to great heat, in a covered crucible lined with charcoal; the product is pure metallic cobalt.

2. Mix equal parts of oxide of cobalt or roasted Cornish cobalt ore, and soft soap, and expose them to a violent heat in a covered crucible.

3. Pass hydrogen gas over oxide of cobalt strongly heated in a porcelain tube.

Prop., Use, &c. Cobalt is a white, brittle metal; unchanged in the air; feebly acted on by dilute hydrochloric and sulphuric acids; has a high melting-point, and is strongly magnetic; sp. gr. 8·5. It is seldom employed in the metallic state, from the great difficulty of reducing its ores, but its oxide (black oxide) is largely employed in the arts. It forms salts with the acids, which are interesting from the remarkable changes of colour which they exhibit. See INK, SMALT, ZAFFRE, and *below*.

Char., Tests. Solutions of the salts of cobalt are known as follows:—1. Ammonia gives a blue precipitate, slightly soluble in excess, giving a brownish-red colour.—2. Potassa gives a blue precipitate, turning to violet and red when the solution is heated.—3. Carbonate of ammonium and carbonate of sodium give pink precipitates; that from the former is soluble in excess.—4. Cyanide of potassium gives a yellowish-brown precipitate, soluble in excess; and the clear solution, after being boiled, is unaffected when mixed with hydrochloric acid.—5. Sulphuretted hydrogen produces no change in acid solutions.—6. Sulphydrate of ammonium gives a black precipitate in neutral solutions.—7. Melted with borax, before the blowpipe, it gives a bead of a magnificent blue colour, almost verging on black, if much is present. Phosphate of sodium and ammonium give a similar bead; but the colour is less intense.

Cobalt, Ac'etate of. $Co(C_2H_3O_2)_2$. *Prep.* From the carbonate or protoxide and acetic acid. It forms a sympathetic ink which turns blue when heated.

Cobalt, Car'bonate of. $CoCO_3$. *Prep.* By adding an alkaline carbonate to a solution of the nitrate or sulphate. A pale peach-coloured powder, soluble in acids. It contains some hydrate.

Cobalt, Chlo''ride of. $CoCl_2$. *Syn.* HYDROCHLO''RATE OF C., MU''RIATE OF C. *Prep.* *By dissolving the* carbonate or protoxide in *hydrochloric acid;* the solution deposits deep rose-red crystals on standing, which contain water. By evaporating the solution by heat, anhydrous blue crystals of the chloride are obtained. Both of them yield a deep rose-red solution with water, which is turned green by a little acid. This solution forms a well-known sympathetic ink, the traces of which become blue when heated. If the solution contains either chloride of iron or chloride of nickel, the traces become green. (Klaproth.) The addition of a little nitrate of copper to the above solution forms a sympathetic ink, which by heat gives a very rich greenish-yellow colour. (Ure.) The addition of a very little common salt makes the traces disappear with greater rapidity, on the withdrawal of the heat. In each case, when the paper is laid aside, moisture is absorbed, and the writing once more disappears. If, however, much heat has been used, the traces become permanent.

Cobalt, Ni'trate of. $Co(NO_3)_2$. *Prep.* As the last, substituting nitric for hydrochloric acid; it forms deliquescent crystals.

Cobalt, Ox'alate of. CoC_2O_4. *Prep.* As the acetate, from oxalic acid and the carbonate or protoxide; or by double decomposition.

Cobalt, Ox'ides of. Of these there are two, the protoxide and the sesquioxide; besides an acid compound of cobalt and oxygen, to which the name cobaltic acid has been given.

1. **Cobalt, Protox'ide of.** CoO. *Syn.* Oxide of cobalt, Gray o. of c., Black o. of c., Cobalt black. *Prep.* 1. By precipitating a solution of sulphate or chloride of cobalt with carbonate of sodium, and washing, drying, and igniting the powder which subsides.

2. By boiling powdered bright-white cobalt ore (from Cornwall) in dilute nitric acid, and adding a solution of carbonate of potassium, very gradually, until the clear liquor, after the impurities have settled, becomes of a rose colour; and then as long as a precipitate falls; wash and dry it, as before.

Prop., &c. A gray powder, turning black on exposure to the air; strongly basic; and forming salts with the acids, having a fine red tint. It is remarkable for the magnificent blue colour it communicates to glass, and by this character its presence may be readily detected before the blowpipe; the substance to be examined being fused with borax on a loop of platinum wire. *Used* to make blue colours for painters, stains and glazes for enamellers, glass-melters, potters, &c. In *medicine*, it has occasionally been given as a remedy for rheumatism.

2. **Cobalt, Sesquiox'ide of.** Co_2O_3. *Syn.* Perox'ide of Cobalt. A black, insoluble, neutral powder, obtained by mixing solutions of cobalt and of chloride of lime; or, by heating the protoxide to redness in an open vessel.

Cobalt, Phos'phate of. $Co_3(PO_4)_2$. *Prep.* As the acetate, substituting phosphoric for *acetic acid*. An insoluble purple powder, which, when heated along with eight weight of gelatinous alumina, produ pigment (cobalt blue, cobalt u rine), almost equal in beauty to (See *below*.)

Cobalt, Sul'phate of. $CoSO_4$. By sulphuric acid on the metal, or by the oxide in the acid. It forms re tals, soluble in 24 parts of water.

Cobalto-Ultramarine. A fine blue p prepared by mixing freshly precipit mina, 8 parts, with phosphate or ar cobalt, 1 part; drying the mixture, slowly heating it to redness. By day colour is pure blue, but by artificial li violet. See Blue Pigments.

COC'CULUS IND'ICUS. *Syn.* Indi ries, Indian cockles, Levant nu grains; Bac'ca Orienta'lis, Coccu cator'ius, &c., L. The fruit of the *paniculata*, a shrub which abounds sandy shores of Malabar, and several islands in the Indian Ocean. The should fill at least two thirds of the fr

It is a dark, tough, hard wrinkled about the size of a cherry, and posses tensely bitter taste. The berry co two parts, the husk and the kernel, the being hard and difficult to bruise, latter soft and containing a large pr of fatty matter.

Uses, &c. Cocculus indicus is pois all animals, and to most vegetables. never employed internally in medicine, b ointment, formed by mixing the powder lard, has been used to destroy pedicu in porrigo. Its active principle is p toxin, a peculiar needle-shaped, cryst substance, possessing all the poisonous pr ties of the berry in an exalted degree, a which it contains about 2 per cent. Its on the system are, to produce giddiness, vulsions, and insensibility, frequently in death. A small portion of the coccu dicus imported is used by poachers, and a smaller quantity to destroy vermin, the maining, and by far the greater part, i employed to adulterate beer and even "In our own analytical experience, we seldom found this substance in beer purch from a respectable house. We have det it, however, in beers purchased in the l localities in London and elsewhere, but every reason to suspect that the adult had been added by the publican himself, form of an extract known in the trade name of 'B. E.' or black extract." (ness.)

Chemists and druggists are liable to penalties if they are found supplying c *indicus*, or any extract of the same, to b or publicans. See Beer, Porter, &c.

COCH'INEAL. *Syn.* Coc'cus (B. P Grana fina, Span. The *Coccus Cacti* (an insect found upon the cactuses of It is of great value as a dye-stuff. The

:ured, are brushed off the
y artificial heat. The entire
ıere are two varieties known
ver *cochineal*, which has a
ilver-gray colour; and *black*
s smaller, and of a reddish
colour. The former is that
th.

ıe cochineal has the sp. gr.
ıonly increased in weight by
ıg it with gum-water, and
in a bag, first with sulphate
n with finely powdered bone-
ay its sp. gr. is raised to 1·35,
' being loaded by about 12%
ı matter.

chineal is principally used to
carmine, and in dyeing. Its
ıle is freely soluble in water.
variety of scarlet and crimson
cs previously prepared with
ther mordants. It is also used
s, tinctures, and confectionery.
ımmended as an antispasmodic
hooping-cough and neuralgia.
60 grs., in powder, confection,
See CARMINE and CARMINIC

ID. *Syn.* COCOSTEAR'IC ACID.
fatty acid, obtained by the
f COCOA-NUT OIL. See STEARIC

'-ko). *Syn.* CACA'O. An ali-
nce formed of the roasted seeds
ma *Cacao*, a tree belonging to
der *Byttneriaceæ*. This defini-
applicable to chocolate, but we
s the preparations containing
ouring substances under that
unsweetened and cheap prepa-
OCOA. The cocoa-seed or berry
nfounded with the *cocoa-nut*,
uit of a palm (*Cocos nucifera*).
is a native of Mexico, and is
s extensively grown through-
erica, Brazil, Peru, Venezuela,
lor, Grenada, Demerara, Esse-
il, and Surinam; with some
ndia Islands, foremost among
rinidad. It has also been in-
nore or less success into Africa,
Madagascar, Bourbon, the
ustralia, and the Philippine
ollowing is a list of the prin-
ocoa, in the order of their com-
—Caraccas, Surinam, Trinidad,
ica, Dominica, Guayaquil, Ve-
Brazil, St. Lucia. It seems
some of the highest kinds of
d their way into this country,
umed by the inhabitants of

pods containing the seeds are
ripe, and after having lain for
ht are opened, *and the seeds,*
out by hand, are submitted to what is termed the sweating process. They are first placed on a sloping floor or in baskets, so that the chief part of the pulp in which they are enveloped may drain off, and are then shut up in a close box, and left for 24 to 48 hours, according to the season and weather, after which they are turned out in the sun to dry. Upon a nice performance of the sweating process, which may be likened to malting, the value of the cocoa greatly depends. When quite dry, the seeds are packed in barrels or bags, and are ready for shipment. The process of roasting is effected in a metal cylinder, with holes at each end, through which the vapour generated is allowed to escape. When the aroma is sufficiently developed, the seeds are cooled, and then passed to a 'kibling mill,' which removes the husks and skins from the 'nibs' (see *below*).

Prop., Constituents, &c. Cocoa, when unadulterated, forms a wholesome and highly nutritious beverage. Its active principle is *theobromine*, an alkaloid greatly resembling caffeine, the active principle of coffee and tea. A peculiar concrete oil, called cocoa-butter, or, more correctly, butter of cacao, is another important constituent, forming more than half the weight of the seed. The presence of about 20% of albumen gives to cocoa its nutritive character.

Adult. Much of the cheap stuff sold as genuine cocoa is shamefully adulterated. Out of 68 samples of cocoa and chocolate examined by the 'Lancet' commission, 39 contained coloured earthy substances, as reddle, Venetian red, umber, &c. To some, chalk or plaster of Paris had been added, for the purpose of increasing the weight. Many of the samples consisted of sugar and starch, with only sufficient cocoa to impart a flavour. Cocoas containing a moderate amount of arrow-root or other starch must not be considered adulterated articles, for it is impossible to render cocoa soluble, or rather emulsive, without the addition of some diffusible substance.

Cocoa, Flake. This is formed by grinding the nibs in a mill, consisting of two cones, working one inside the other. Pure flake cocoa is not a diluted or amalgamated article; in other words, it contains no sugar, and but a trace of starch.

Cocoa Nibs. The bruised, roasted seeds, freed from husk and membrane. They ought to be of a dull-red or grayish colour, but are frequently given a bright-red colour by a coating of Venetian red.

Cocoa, Sol'uble. From *cocoa nibs* and substances which are readily soluble or diffusible in water, ground together. Sugar and sago or arrow-root are the diluents used by respectable makers, but all kinds of starches, coloured with Venetian red, are used for the trashy articles which are sold to the poor. No form *of cocoa is really soluble*, but by the addition *of easily diffusible* substances an article is pro-

2. Cocoa, Homœopathic. A kind of soluble cocoa prepared with arrow-root, but without sugar.

3. Cocoa, Iceland-moss. From cocoa and Iceland moss, freed from its bitter principle, cetrarine. This form of cocoa was introduced by Messrs. Dunn and Hewett, and is said to form a very valuable article of diet for invalids.

4. Cocoa, Maravilla. This is stated to be "the perfection of prepared cocoa." It consists of cocoa, sugar, and sago flour, the last two being in great excess.

5. Cocoa, Caraccas. This is similar to the last, being a mixture of cocoa, sugar, and sago flour. The cocoa used in its manufacture is said to be imported from the Caraccas, on the north coast of South America, and to possess a peculiarly delicious flavour.

The amount of flour or starch in these so-called soluble cocoas frequently exceed 40 per cent., and the amount of sugar 20 per cent. They have been, not inaptly, called "soups."

Within the past year or two a new variety of soluble cocoa has been brought into the market. It is sold under various names, thus, 'Theobromine, or Concentrated Cocoa, 'Cocoa Essence,' 'Cocoatina,' &c. We have examined many of these varieties, and find them to consist of pure cocoa deprived of about two thirds of its fat. It appears very suitable for people of weak digestion.

Obs. No warm drink that we take approaches cocoa in its nutritive character, because, while performing to a certain extent the exhilarating work of coffee or tea, it presents

L. A fish common in the seas o
hemisphere, from about 40° to 7
The flesh forms a most wholesom
article of food. The best fish
about the neck; and, when fres
by the redness of the gills, fr
eyes, and the whiteness and fir
flesh. The fish so largely import
foundland (Newfoundland f
beheaded, split open, gutted, and
are caught by millions on the '
Cod-sounds are pickled in brine
into isinglass. The spawn i
caviare, and the liver is both
boiled for its oil (see *below*).

Cod is generally cooked
but is sometimes baked, or cut i
broiled or fried. Cod's head a
with oyster sauce is a favorite
and anchovy sauce are also good

COD-LIV'ER OIL. *Syn.* Mor'r
B. P.; O'leum jecor'is Asel'l
de Morue, Fr. The oil obtai
liver of the common cod (*oleum*
paratum).

Prep. 1. The livers being
the fish, are piled on layers of fi
in tubs perforated at the bot
allowed to remain for a cons
exposed to the sun and air.
putrefy, the oil runs out and flow
holes in the tubs into vessels
ceive it.

2. The partially decomposed l
pieces, are heated in iron pots
and the oil is poured off and se

allic vessel and heated with ; to 180° Fahr., by which treat- down into a uniform pulpy, his mass is immediately trans- bags, whence the oil drains tion, while still warm, this oil re for use.

nds of cod-liver oil are usually he pale yellow, pale brown, and he latter is the most impure; ste are extremely disagreeable. icting opinions have been ex- cal men as to the relative value brown and yellow varieties. ver oil is said to be prepared by into the oil, and then exposing Dr. Letheby has applied the tests to this much-vaunted as not been able to detect the of ozone.

ses. Cod-liver oil has acquired on for its remedial powers in sumption, scrofulous and other tions, chronic gout and rheuma- kin diseases, and several other is generally supposed that the romine, which are present in ities in this fish, are the sub- ich it owes its efficacy. "Dr. rs its virtues to the presence of d the elements of the bile. Our s lead us to infer, that one of its constituents is free phosphorus. r oil contains fully ·02 of this well as about ·09 of phosphoric he marked action of minute doses s on the nervous, vascular, and ms, is well known to every expe- son. The difficulty, however, of into a form adapted for adminis- hitherto prevented phosphorus ively employed as a therapeutic obstacle is removed by the em- cod-liver oil. Nature has here mple remedy, which the ingenuity ailed to produce artificially. This orne out by the facts, that cod- s those forms of scrofula and other ch do not yield to iodine, and that ies of the oil are the most active in the most free phosphorus. We, ink it reasonable to conclude, that of cod-liver oil depends on the of the minute quantities of iodine, and the elements of the bile, which nd not on any one separately; and stance, at present known, can be stitute for it." (Cooley.)—*Dose.* on water, syrup, or orange juice; an emulsion with 1 fl. oz. of pep- r.

$C_{18}H_{21}O_3$. Aq. *Syn.* CODE'- kaloid discovered by Robiquet th morphia.

ive commercial hydrochlorate of *ater, and precipitate the morphia* with ammonia. Codeia is left in solution, and is obtained in octahedral crystals by spontaneous evaporation. It may be further purified by solution in ether. By the addition of a little water to the ethereal solution, and spontaneous evaporation, it may be obtained quite pure and in a crystalline state.

Obs. The morphia may be recovered by digesting the precipitate in weak solution of potassa.

Prop., *&c.* Freely soluble in alcohol and ether; soluble in 80 parts of cold and 17 parts of boiling water. Its solution in the latter, by slow evaporation, yields large, transparent octahedra. With the acids it forms crystallisable salts. These possess the singular property of producing a general and violent itching of the surface of the body when administered internally. The same symptoms frequently follow the exhibition of opium and hydrochlorate of morphia, and are referred to the presence of codeia. The commercial muriate of morphia frequently contains 3⅔ to 4⅔ of codeia.

Tests. It is distinguished from morphia by not becoming blue on the addition of sesquichloride of iron, nor turning red with nitric acid; and by not being precipitated by ammonia, when dissolved in hydrochloric acid and mixed with a large quantity of water. Unlike morphia, it is insoluble in weak solution of potassa, and is soluble in ether. The salts of codeia are known by tincture of galls throwing down a copious precipitate from their solutions; this does not occur with the salts of morphia. It is distinguished from meconia by its aqueous solution showing an alkaline reaction with test-paper.

COF'FEE. The seeds or berries of the *Coffea arabica* (Linn.) or coffee plant; a shrub of the natural order *Cinchonaceæ*, sub-order *Coffeæ*, indigenous in the low mountainous districts of Arabia Felix, and largely cultivated in various other parts of the world. About 40 millions of pounds of coffee are annually consumed in this country, and the consumption for the whole world has been estimated at about 600 millions of pounds. The seeds are roasted and ground, and used in the form of a decoction or infusion. The term coffee is applied to the prepared beverage as well as to the seeds. The valuable properties of coffee are mainly due to the presence of the alkaloid CAFFEIA or CAFFEINE.

Prep., *&c.* The finest kind of coffee is that called mocha, from Aden, but that in common use is principally supplied from the British plantations in the West Indies. The selection being made, the berries are carefully roasted in revolving cylinders by a gradually applied heat, until the aroma is well developed, and the toughness destroyed. Too much heat is avoided, as the volatile and aromatic properties of the coffee, and, consequently, the *flavour, are thereby* injured; whilst, on the *other hand, if the* berries are roasted too little, they produce a beverage with a raw, green taste, very liable to induce sickness and vomiting. When properly roasted, coffee has a lively chocolate-brown colour, and should not have lost more than 18% of its weight by the process. If the loss exceeds 20%, the flavour suffers in proportion. The roasted coffee should be placed in a very dry situation, and excluded from the air as soon as possible. It loses flavour by keeping, and also powerfully absorbs moisture from the atmosphere by reason of its hygrometric power.

Qual., &c. Coffee promotes digestion, and exhilarates the spirits, and when strong, generally occasions watchfulness, but in some phlegmatic constitutions induces sleep. Drunk in moderation, especially if combined with sugar and milk, it is perhaps the most wholesome beverage known. The various qualities that have been ascribed to it by some persons, such as dispelling or causing flatulency, removing dizziness of the head, attenuating the blood, causing biliousness, &c., appear to be wholly imaginary. In a medical point of view, it has been regarded as a cerebral stimulant and anti-soporific, and as a corrector of opium. As a medicine, it should be strong, and is best taken only lukewarm.

Adult., &c. The principal substances used for the purposes of adulteration, are caramel, roasted chicory, roasted locust beans, roasted corn, &c. Chicory being now charged with the same amount of duty as coffee, is not considered, in a revenue point of view, an adulteration; nevertheless, when we contrast coffee with chicory, we at once see the vast superiority of the former over the latter, thus:—

Coffee is the fruit of a tree, whilst chicory is the root of an herbaceous plant, and it is well known that more virtues exist in fruits and seeds than in roots.

Coffee contains three active principles, viz. an essential oil, caffeia, and tannic acid, and these exercise a powerful influence on the system, retarding the waste of the tissues of the body, exciting the brain to increased activity, and exhilarating without intoxicating. Chicory contains none of these constituents.

Coffee exerts on the system highly beneficial physiological effects; chicory possesses medicinal properties, which are not desirable in an article of food.

Chicory, therefore, is very objectionable, and when a dealer sells a mixture of coffee and chicory for pure coffee, as is almost invariably the case, he is guilty of selling an adulterated article, and ought to be punished accordingly.

The adulteration with caramel or chicory may readily be detected as follows:—

1. A spoonful of pure coffee placed gently on the surface of a glass of cold water will float for some time, and scarcely colour the liquid; if it contains caramel or chicory, it *will rapidly* absorb the water, and, sinking to
the bottom of the glass, communica
reddish-brown tint as it falls. Anothe
of applying this test is by expertly
spoonful of the suspected coffee with
glassful of cold water, and then pl
glass upon the table. If it is pur
rise to the surface, and scarcely co
liquid, but if caramel or chicory is p
will sink to the bottom, and the wate
tinged of a deep red, as before.

2. The brown colour of decoction or
of roasted coffee becomes greeni
treated with a per-salt of iron; and a
green, flocculent precipitate is form
colour of chicory is only deepened,
otherwise altered, and no precipitate i
under the same treatment. A mi
chicory and coffee retains a browni
colour after the precipitate has subs
the liquid appears brownish-yellow
fracted light. The addition of a litt
ammonia water aids the subsidence
precipitate.

3. Under the microscope, the pre
chicory may be readily detected by th
form, and ready separation of the cells
cellular tissue, and by the presen
abundance of the pitted tissue or dotted
which are absent from coffee, and by th
of the spiral vessels, which are very
coffee. The most characteristic
however, and that by which chicory
easily identified, is the lacticiferous
Roasted corn, and other amylaceous
may also be detected, in the same way,
peculiar size and character of their
grains.

Roasted corn, beans, &c., may be de
by the cold decoction striking a blue
with tincture of iodine. Pure coffee is
deepened a little in colour by this subst

Obs. A few years ago the attention
scientific world was drawn to the val
roasted coffee leaves, as furnishing ma
for a beverage unexcelled in excellence
coffee berry itself. It appears that the
prepared for use, may be purchased for
lb., or packed ready for export at 2d.
"That this preparation contains a consi
amount of the nutritious principles of
evident from the analysis; but as the
can only be collected in a good state
expense of the coffee-bush, it is
whether the coffees produced by the
be not, after all, the cheapest, as it
is the best." (Jury Report, Exhibition,
Coffee for the table is best prepared
aid of a French cafetière, or coffee
furnished with a percolator or strainer,
will permit a moderately rapid filtration
produce this beverage in perfection,
necessary to employ the best materials
preparation—fresh roasted and fresh
"At least 1 oz. of coffee should be
make 8 common-sized coffee-cupfuls,
teaspoonful of freshly roasted and

ed strong, the quantity of
doubled." (Cooley.) Many
rinkers cannot tolerate the
hich is a doubtful improver
revailing fault of the coffee
is its want of strength and
ee-pot should be heated pre-
in the coffee, which may be
a little boiling water. The
of boiling coffee is quite
all its flavour and aroma is
by boiling hot water. In-
eful and agreeable matter in
luble; it comes off with the
fusion, and needs no boiling."
rejudice, however, induce the
k to boil her coffee, it should
nered for a minute, as long or
jures it considerably.
s prepared in a common pot,
first made hot, the boiling
poured over the powder, and
mly the plan, put in first. It
ept stirred for 4 or 5 minutes,
ld be poured out and returned
peration repeated 3 or 4 times,
allowed to repose for a few
generally become fine of itself.
n a percolator is not used, the
well stirred up several times
vering it up to settle for use.
etimes clarified by adding a
s, a small piece of clean eel-
a spoonful of white of egg.
lan, common in France, is to
l containing the made coffee
th, and to sprinkle over its
upful of cold water, which from
nty descends, and carries the
it. Another plan sometimes
rap a cloth, previously dipped
r, round the coffee-pot. This
nonly practised by the Arabians
urhood of Yemen and Moka,
rifies the liquor, unless a very
of chicory is present. It should
hat the use of isinglass, white of
artificial finings, remove much
ncy and vivacity of the liquor.
, who are remarkable for the
of their coffee, generally allow
h large coffee-cupful of water,
e coffee both newly ground and
. A shred of saffron, or a little
ently added, whilst the perco-
t is generally employed. When
es a common coffee-pot, he gene-
e water into 2 parts. The first
s on boiling hot, and allows it to
5 minutes; he then pours this
possible, and boils the grounds
tes with the remaining half of
s soon as this has deposited the
decanted, and mixed with the
object of this *process is to ob-*
of the strength as well as the flavour. The infusion is thought to contain the latter, and the decoction the former; a plausible, but erroneous idea, since both of them were carried off by the first water.

A much better method, and one we can recommend from experience, is to divide the coffee into 2 parts. Boil the first portion in the coffee-pot, for 4 or 5 minutes, then add the other portion, and allow it to infuse slowly for about 10 minutes, the coffee-pot lid being kept well closed. This gives a coffee possessing a flavour which even the French cannot excel.

Coffee, Essence of. A highly concentrated infusion of coffee, prepared by percolation with boiling water, gently and quickly evaporated to about ⅓rd or ¼th of its bulk, and mixed with a thick aqueous extract of chicory and syrup of burnt sugar, so as to give the whole the consistence of treacle. The proportions of the dry ingredients should be—coffee, 4 parts; chicory, 2 parts; burnt sugar (caramel), 1 part. It should be kept in well-corked bottles in a cool place. This preparation is very convenient for making extemporaneous coffee; but the beverage so made, though superior to much of that sold at coffee-houses, is inferior in flavour, aroma, and piquancy, to that we are accustomed to drink at home. Much of the so-called 'Essence of Coffee' is simply treacle and burnt sugar, flavoured with coffee.

Coffee, Searle's Patent. This is prepared by mixing condensed milk with a very concentrated essence of coffee and evaporating at a low temperature (*in vacuo*, if possible), until the mixture acquires the consistence of a syrup (coffee syrup), paste (coffee paste), or candy (coffee candy). The last may be powdered (coffee powder, dry essence of coffee).

Coffee, Substitutes for. These are numerous, but are now seldom employed, owing to the cheapness of the genuine article, and the stringency of the revenue laws. Among the principal are the following:—

1. Coffee, Acorn. From acorns deprived of their shells, husked, dried, and roasted.

2. Coffee, Bean. Horse-beans roasted along with a little honey or sugar.

3. Coffee, Beet-root. From the yellow beet-root, sliced, dried in a kiln or oven, and ground with a little coffee.

4. Coffee, Dandelion. From dandelion roots, sliced, dried, roasted, and ground with a little caramel.

5. Coffee, German. *Syn.* Succory c., Chicory c. From chicory or succory. *Used* both for foreign coffee, and to adulterate it.

Obs. All the above are roasted, before grinding them, with a little fat or lard. Those which are larger than coffee-berries are cut into small slices before being roasted. They possess none of the exhilarating properties or medicinal virtues of foreign coffee.

COINS. See Medals and Electrotyping.

COKE. *Charred* or carbonised coal. The *principle of its* manufacture is similar to that coal, is the sort commonly used for making coke in ovens.

2. GAS COKE; DISTILLED COKE. The cinder left in the gas-retorts. Gray; produces a weak heat, insufficient to smelt iron.

3. SHALE COKE; MINERAL CARBON. From bituminous shale, burned in covered iron pots, in a similar way to that adopted for making bone-black; or in piles. Black and friable. *Used* to clarify liquids, but is vastly inferior to bone-black, and does not abstract the lime from syrups. See FUEL, PIT-COAL, &c.

COLCHICIN'A. *Syn.* COL'CHICINE, COLCHI'CIA. A peculiar principle discovered by Gieger and Hesse in the seeds of the *Colchicum autumnale* or common meadow saffron. It also exists in the corms or bulbs.

Prep. Macerate the bruised seeds in boiling alcohol, add magnesia, to throw down the alkaloid, digest the precipitate in boiling alcohol, and filter. By cautious evaporation colchicine will be deposited, and may be purified by re-solution and crystallisation in alcohol.

Prop., &c. Odourless; bitter; soluble in water and alcohol; forms salts with the acids. It is very poisonous. $\frac{1}{10}$th of a grain, dissolved in spirit, killed a cat in 12 hours. It differs from veratria in being soluble in water and crystalline, and in the non-production of sneezing when cautiously applied to the nose. Strong oil of vitriol turns this alkaloid of a yellowish-brown; nitric acid turns it of a deep violet, passing into indigo-blue, green, and yellow. It is not used in medicine.

COL'CHICUM. *Syn.* MEA'DOW SAF'FRON; COLCHICUM AUTUMNALE (Linn.), L. The recent and dried corms or bulbs (*colchici*

When the body of an animal is
an atmosphere at a temperatur
healthy standard, a sensation o
experienced, produced by the pa
caloric or heat of the body int
medium. If this abstraction of ca
the quantity produced by the
the temperature of the body decr
sinks below the point at which t
of life can be performed. This d
the heat of the body is gradual;
sensation of coldness changes int
nation for voluntary motion; ne
drowsiness, followed by numbnes
sibility. At this point, if the su
rescued, and remedial measures
to, death inevitably and rapidly e

The prevention of the effects of
in the use of ample food and clot
tioned to the inclemency of the
exposure to be endured, and the
wearer. The circulation of the
be promoted by active exercise,
position to sleep shaken off by inc
exertion. The principal endeavo
to keep the extremities and chest
this can be accomplished, no dan
feared.

In cases of asphyxia produced
cold, the patient should be laid
remote from the fire, and bathe
salt-and-water, or water to which
or vinegar has been added; afte
body should be wiped dry, and
duously applied by the hands of th
(warmed); as many operating at
conveniently do so. Gentle stimu

A snow-white, bland oint-
nsistence of good lard, and
stitute for that excipient
no object, especially for ap-
e face. It is commonly sold
as a healing application to
ed surfaces generally. The
are given under the head of
s (which *see*). The follow-
erior article.

Turnbull.) From white wax,
nds, 4 oz.; rose-water, 2 oz.;
f roses, 5 drops. Melt, and
in the oil of almonds by a
olve the borax in the rose-
en to be warmed a little and
ted oil; lastly, add the oil of

Col'ica, L. The belly-ache
ame is popularly given to all
lominal pains, without refe-
. There are several varieties
noticed below.

'al. Produced by improper
a. The treatment may be
ecommended for bilious or

In this variety the pain is
transient, accompanied by
ea, and vomiting. The fæces,
, dark-coloured, and offensive.
edies are, a full dose of blue
cynth, or aloes, followed by a
y of Epsom salts or Glauber's
mentations are also service-

it. Marked by constipation,
distension of the bowels by
by a rumbling noise, &c. It
duced by the use of indiges-
nd slops. The remedies are,
acture of rhubarb combined
s of essence of peppermint.
afford relief, an Abernethy
, washed down with a glass
ter, as peppermint, cinnamon,
hen the pain is extreme, warm
the belly, or a carminative
rally give relief.

'a. *Syn.* Plumb'er's colic,
Lead c.; Col'ica picto'num,
y-ache. It is marked by ob-
s, acrid bilious vomitings,
out the region of the navel,
s in the intestines, and a ten-
is in the extremities. It is
in the cider counties, and
exposed to the fumes of lead.
the same as for the spasmodic
these fail, after the bowels
ghly evacuated, small doses
opium may be administered.
er or sweetened water very
d with sulphuric acid, had
beverage. *Mr. Benson, the*
r of the British White-lead Works at Birmingham, says:—"Although during several weeks after the addition of the sulphuric acid to the treacle beer, drank at the works, little advantage seemed to be derived, yet the cases of lead colic became gradually less frequent, and since October of that year, or during a period of fifteen months, not a single case of lead colic has occurred amongst the people." ('Lancet.') See Sulphuric Beer and Sulphuric Acid.

Colic, Spasmod'ic. Marked by a fluctuating pain about the navel, which goes away and returns by starts, often leaving the patient for some time. The belly is usually soft, and the intestines may often be felt in lumps, which move about under the hand, or are wholly absent for a time. It is unaccompanied by flatulency. The remedies are warm fomentations, warm clysters, and carminatives, accompanied by small doses of camphor and opium.

Colic, Stercora'ceous. Marked by severe griping pains and constipation of the bowels. The remedies are powerful cathartics, as full doses of calomel, aloes, colocynth, jalap, &c., followed by purgative salts, as sulphate of magnesia, or sulphate of soda.

COLLO'DION. *Syn.* Collo'dium, L., B. P. A viscid fluid formed by dissolving pyroxylin (Schönbein's gun-cotton) in a mixture of ether and alcohol. In *surgery*, it is used in its natural state, and combined with certain elastic and medicinal substances. In *photography*, it is used in combination with agents that render it sensitive to the action of light.

Collodion. *Syn.* Plain collodion. The following are the best methods of preparing plain collodion for surgical purposes:—

Prep. 1. (Ph. U. S.) Nitrate of potassa, in powder, 10 oz.; sulphuric acid, 8½ fl. oz.; triturate together in a wedgwood mortar until uniformly mixed; then add of fine carded cotton (free from impurities), ½ oz.; and by means of the pestle or a glass rod, saturate it thoroughly with the liquor for a period of about 3 or 4 minutes; next transfer the cotton to a vessel containing water, and wash it in successive portions of pure water, with agitation and pressure, until the washings cease to affect litmus paper or a solution of chloride of barium; it is then to be spread out and dried by a very gentle heat, and dissolved by agitation in a stoppered bottle with rectified sulphuric ether, 1 quart, to which rectified spirit (alcohol), 1 fl. oz., has been previously added.

2. (Mialhe.) Nitrate of potassa, 40 parts; concentrated sulphuric acid, 60 parts; carded cotton, 2 parts; proceed as last until the dry cotton is obtained, then take of the prepared cotton, 8 parts; rectified sulphuric ether, 125 parts; mix in a well-stoppered bottle, and agitate it for some minutes; then add, gradually, rectified alcohol, 1 part; and continue to shake until the whole of the liquid acquires *a syrupy consistency. It* may be now passed *through a cloth; but* a better way to prevent

loss is to let it repose for a few days, and then decant the clear portion.

3. (Lauras.) This process only differs from No. 2 in the following particulars:—The cotton is immersed for 12 minutes, then rinsed 2 or 3 times in cold water, and afterwards immersed in a solution of carbonate of potassa, 4 parts, and water, 200 parts. Lastly, it is plunged again into simple water, and dried at a temperature of 77° to 86° Fahr.

4. (B. P.) Pyroxylin, 1 part; rectified spirit, 12 parts; ether, 36 parts; mix the ether and spirit, and add the pyroxylin.

5. (Parrish.) Thoroughly saturate clean carded cotton, ½ oz., with fuming nitric acid and sulphuric acid, of each, 4 fl. oz., previously mixed and allowed to become cool; macerate for 12 hours; wash the cotton in a large quantity of water; then free it from the water by successive washings in alcohol, and dissolve in ether, 3 pints.

Obs. For success in the manufacture of collodion, it is absolutely necessary to avoid the presence of water. The ordinary commercial oil of vitriol, sp. gr. 1·84, may be used. Professor Procter, of Philadelphia, gives preference to the process with the mixed acids (No. 5), and directs that the cotton should be allowed to macerate for four days. In drying the cotton great care should be taken to prevent an explosion.

Uses, &c. In *surgery*, plain collodion is employed as a dressing for wounds, and as a protection to abraded surfaces. On drying, it unites the former closely, and preserves the latter from the action of the air. It is impervious to water, and being transparent, it admits of the progress of the wound being inspected when necessary. Such is its adhesive power, that a piece of cloth cemented with it to the dry palm of the hand will support a weight of 25 to 30 lbs. The parts to which it is applied should be freed from moisture. See COLOURED, ELASTIC, MEDICATED and VESICATING COLLODIONS (*below*).

Collodion, Blis'tering. See VESICATING COLLODION.

Collodion, Col'oured. *Syn.* COLLODIUM TINCTUM, L. *Prep.* (Cutan. Hosp.) Collodion, 2 oz.; palm oil, 1 dr.; alkanet root, q. s. to colour (say 15 grs.); digest and decant the clear. Colour bears a greater resemblance to the skin than that of common collodion, whilst it is more flexible; but it is weaker than the latter.

Collodion, Elas'tic. *Prep.* 1. (Lauras.) Heat together Venice turpentine, 2 parts; castor oil, 2 parts; and white wax, 2 parts; add sulphuric ether, 6 parts; and mix all with the product of No. 3 (*above*), that is, to the collodion formed with 8 parts of prepared cotton, 125 ether, and 8 alcohol.

2. (C. S. Rand.) Dissolve prepared cotton (No. 5, *above*), 2 drs., in sulphuric ether, 5 fl. oz.; then add, Venice turpentine, 2 drs., and complete the solution by slight agitation.

Obs. The collodion made by eith above processes, when applied to th forms a transparent pellicle, more pli more difficult to remove than that of collodion.

Collodion, Med'icated. It has been to medicate collodion in several ways, practice has not found much favour w medical profession. The following tions have been described:—

COLLODION, ACONITE. From aco by a similar formula to that of BELLAD (*below*).

COLLODION, BELLADONNA. *Prep.* select belladonna leaves, powdered, ether, 12 fl. oz., with alcohol (95⅔), for six hours. Pack in a percolator, on alcohol till a pint of tincture is in this dissolve pyroxylin (gun-cotto and Canada balsam, ½ oz. *Used* as a for BELLADONNA PLASTER.

COLLODION, CANTHARIDIN. See V ING COLLODION.

COLLODION, IODINE. *Prep.* Dissolv and Canada balsam, of each, ½ oz., in 1 pint. *Used* as a substitute for IODI MENT.

Collodion, Photograph'ic. There many methods adopted for preparing graphic collodion, that a large volume be filled with notices of them. W merely give Mr. Hardwich's forms, wh much esteemed by practical photog The preparation of a sensitive co whether positive or negative, includes distinct operations, namely, the forma the pyroxylin or gun-cotton, the conver this into plain collodion, and the final of iodising the collodion.

1. **Collodion, Pos'itive.** (Hardwich.) T the PYROXYLIN:—Take sulphuric acid, 1·845, at 60° Fahr., 12 fl. oz.; nitric ac gr. 1·45, at 60°, 12 fl. oz.; water, 3½ mix, and allow the temperature to fall to then immerse cotton, 300 grains. (cotton is found to gelatinise or dissolve acid mixture, the quantity of water is too and may be reduced to 3 fl. oz.) The should be well pulled out in pieces, w about 30 grains each; and should be the acid for about 8 minutes, the vess covered over. It is taken out with spatula, squeezed to remove acid, was at least 24 hours by a stream of wat squeezed in a cloth, and pulled out To form the PLAIN COLLODION:—Sha dry pyroxylin, 48 grains, with alcoho ·805, 1½ fl. oz., and then add ether ·725, 4½ fl. oz. The solution should be to rest for a week or ten days, when fluid should be decanted from the To prepare the IODISING SOLUTION:— iodide of ammonium, 1½ dr.; iodide mium, 1½ dr.; bromide of ammo grains; powder, and dissolve in alcoho ·805 to ·816, 10 fl. oz. The coll

ling the solution to it in the
l part solution to 8 parts col-
dised collodion should be kept
x weeks before using. If re-
ediate use, add a few drops of
olution of iodine, formed by
rains of iodine in 1 fl. oz. of

Iardwich recommends that the
being converted into pyroxylin,
used by boiling for two hours in
caustic potassa (2 oz. to the
y being afterwards repeatedly
ied. The purest nitric acid, sp.
d be employed, but the ordinary
lphuric acid (oil of vitriol) is
e for use. To purify the ETHER,
of a certain ozonised principle,
ecompose the iodising solution,
h recommends the following
e the best washed ether of com-
itate it thoroughly with a small
ute sulphuric acid, and then in-
o a retort, and distil over one
cohol used is of the strength of
absolute alcohol; it should be

a, **Neg'ative.** (Hardwich.) To
ROXYLIN:—Take of sulphuric
1·845, at 60°, 18 fl. oz.; nitric
1·475, at 60°, 6 fl. oz.; water, 5½
, 800 grains. Mix, and allow the
to fall to 150° Fahr. The weight
ylin ought to be 375 grains. To
AIN COLLODION:—Take alcohol,
, ½ gallon; ether, sp. gr. ·725, 1
ylin, 1900 grains. Saturate the
ith the alcohol, then pour in half
he ether, agitate for 3 or 4 minutes,
e process in adding the remainder.
clear liquid from the sediment
or ten days' rest. The following
IODISING SOLUTIONS are recom-
. (Potassium Iodiser.) Iodide of
135 grains; alcohol, sp. gr. ·816,
owder and dissolve in the alcohol,
heated to 140°.—*b*. (Cadmium
Iodide of cadmium, 170 grains;
gr. ·816, 10 fl. oz. Dissolve in the
ler.—*c*. (Bromo-iodiser.) Bromide
m, 40 grains; iodide of ammonium,
; iodide of cadmium, 90 grains;
gr. ·816, 10 fl. oz. Pulverise, and
the cold. To sensitise the collo-
o three parts one part of either *a*, *b*,

lost of the practical directions given
head of POSITIVE COLLODION apply
NEGATIVE COLLODION. Nothing
t and intelligent practice will ever
ess in preparing collodion for pho-
purposes. Although formulæ of
l excellence may be used, it con-
ppens that the results are entirely
from some trifling cause. *See* PHO-
t

Collodion, Ves'icating. *Syn.* BLIS'TERING COLLODION, CANTHAR'IDIN C.; COLLO'DIUM VES'ICANS, L. *Prep.* 1. (Tichborne.) Coarsely powdered cantharides, 6 oz., are placed loosely in a displacement apparatus (provided with a tap to regulate the flow), and treated with ether from methylated spirit, 13 fl. oz., and glacial acetic acid, 2 fl. oz., previously mixed together. After the fluid has passed through, it will be found that the *débris* has retained by absorption 7 fl. oz., which must be displaced by the gradual addition of methylated spirits of wine, 7 fl. oz. If properly managed, there is not the least danger of the admixture of the spirits with the percolated menstruum, as the animal substance of the flies swells considerably under the prolonged influence of the spirits of wine, so that the same bulk will be insufficient to quite displace the ether. The ethereal solution should be made to measure exactly 15 fl. oz. with a little spirit, and may then be converted into a collodion by the addition of pyroxylin, ½ oz.

Obs. The glacial acid plays a double part in this preparation. It dissolves the cantharidin, and at the same time gives to the collodion film the essential property of porosity. Ordinary collodion is useless as an excipient, for it produces a tough and contractile film, which really screens the skin from the action of the greater part of the blistering material.

2. (Ilisch.) Cantharidin, 15 grs.; pyroxylin, 20 grs.; rectified ether, 1½ oz.; acetic ether, ½ oz.; dissolve.

3. (Œttinger.) Ether of cantharides and collodion, equal parts.

Use. Vesicating collodion is used as an irritant. No. 1 was introduced in 1862, and has many advantages over the other two. Mr. Tichborne thus described the most effectual method of using it in the 'Pharm. Journ.':—"The part upon which the blister is to be raised should be painted with the vesicant to the desired extent, bearing in mind that the blister produced always extends to about one tenth of an inch beyond the margin of the space covered. Care should be taken to give a coating of considerable thickness, and to ensure this result the brush should be passed over and over again, until about ½ dr. has been used to the square inch, or less when operating upon a tender epidermis. It is desirable to place over the intended blister a piece of oil silk, or, what is still better, a piece of sheet gutta percha, somewhat larger than the surface painted, as this will stop the exhalations of the skin, and so render it moist and permeable. In ten minutes, or a quarter of an hour if the cuticle is hard, the collodion should be wiped off with a little cotton-wool moistened with ether, when the blister will almost instantly rise."

COL'LOID. See DIALYSIS.

COLLYR'IUM. *[L.]* In *medicine* and *pharmacy*, a *topical* remedy for diseases of the eye.

Formerly the term collyrium was applied to any medicament employed to restrain defluxions.

Collyr'ium, Dry. *Syn.* EYE POWDER; COLLYR'IUM SIC'CUM, L. *Prep.* 1. (Dupuytren.) White sugar, 1 dr.; red oxide of mercury, 10 grs.; oxide of zinc, 20 grs.; mix.

2. (Lagneau.) Sugar candy, 2 parts; nitrate of potassa, 1 part.

3. (Falconer.) Chloride of barium, 1 gr.; sugar candy, 1 dr.

4. (Radius.) Calomel and white sugar, of each, ½ dr.; opium, 10 grs.

5. (Recamier.) Oxide of zinc and sugar candy, equal parts.

6. (Velpeau.) Trisnitrate of bismuth and sugar candy, equal parts.

7. (Wiseman.) Acetate of soda, 10 grs.; powdered opium, 1 gr.; sugar candy, ½ dr.

Obs. It is absolutely necessary that the ingredients in the above preparations should be reduced to an impalpable powder, by careful trituration in a wedgwood mortar. For use, a small pinch is placed in a quill or straw, and blown into the eye previously opened with the fingers. On the whole, they may be regarded as unnecessary preparations, and are unsafe, except in skilful hands.

Collyrium, Liq'uid. See WATER (Eye).

Collyrium, Unct'uous. See OINTMENT (Eye).

COL'OCYNTH (-sinth). *Syn.* (COLOCYNTH PULP., COLOCYNTHIDIS PULPA, B. P.) BIT'TER AP'PLE, BITTER GOURD, BITTER CU'CUMBER, PEELED COLOCYNTH; COLOQUINT'IDA, COLOCYNTH'IS (B. P.), L. The decorticated fruit or pulp of the *Citrullus Colocynthis* (Schrad.—Ph. L.), or *Cucumis Colocynthis* (Linn.—Ph. E. & D.). It is an acrid, drastic purge and hydragogue, and cannot be given alone with safety; but, in combination with other substances, it forms some of our most useful cathartic medicines.

COLOCYNTH'IN. *Syn.* COLOCYNTH'IUM, L. The bitter, purgative principle of colocynth.

COL'OPHENE. Formed by distilling oil of turpentine with concentrated sulphuric acid. A colourless, viscid, oily liquid; with a high boiling-point; and exhibiting a bluish tint by reflected light.

COL'OPHONY. See RESIN.

COLOUR BLINDNESS. *Syn.* DAL'TONISM. A curious defect of vision, from which the eye is incapable of distinguishing colours. It is of three kinds:—1. An inability to distinguish any colour properly so called, the person being only able to distinguish white and black, light and shade. 2. An inability to distinguish between the primary colours, red, blue, and yellow, or between these and the secondary or tertiary hues, such as green, purple, orange, and brown. 3. An inability to distinguish nicer shades and hues, as grays and neutral tints. The first form is rare; the second and third are common. Dr. George Wilson found that of 1154 persons examined by him in Edinburgh, 65, or 1 in 177, were
of these, 21 confounded red w
brown with green, and 25 blue

COL'OURING. *Syn.* BRAND
BREWER'S C., SPIRIT C., CAR'AM
BI'NA, L. *Prep.* Brown sug
an iron vessel over the fire,
black and bitter, stirring it well
after which water is added, and
a syrup. In the making of br
white sugar is more frequently

Obs. Some persons use lim
solve the burnt sugar. Care
not to overburn it, as a great
thereby rendered insoluble. Th
not exceed 430°, nor be less th
Fahr. The process, for nice e
best conducted in a bath of
which a little bismuth has b
reduce its melting-point to abou
powdered resin or charcoal or a
put upon the surface of the me
the oxidisement of the alloy. S

COL'OURS. White light fron
a compound nature, and may b
into rays of different colours.
guished seven PRIMITIVE COL
violet, indigo, blue, green, yellow
red. Sir D. Brewster is disp
that four of these colours are rea
and that three, namely, blue, ye
alone deserve the name of pri
colours of natural objects are
result from the power possessed
faces of absorbing some of the
of light, while they reflect or tr
case may be, the remainder of th
an object appears red because
causes to disappear the yellow
composing the white light by
illuminated. Black and white a
strictly speaking.

A body is said to be black w
or quenches a large proportion o
of white light falling upon it.
to be white when it receives th
and reflects all the rays with mod
Gray may be regarded as a lu
or dark white. The names gi
are far from being satisfactory,
many thousand shades may be
by a practised eye, it is a que
there are fifty names which wo
same idea of shade to any ten
the world. The names taken
coloured objects, as indigo, violet
amber, emerald, &c., are the least
M. Chevreul has devised an ing
of naming and classifying colo
ploys only 6 fundamental nam
those of the three elementary
yellow, and blue; and of the th
colours, orange, green, and vi
direct union of the elementary
colours, 6 tertiary colours are
arranges the twelve colours

ɪeel, commencing with the
he right, thus:—Red, red-
low-orange, yellow, yellow-
reen, blue, blue-violet, violet,
ɪromatic circle is completed
between the red and red-
:he red-orange and orange;
ɪ each of the other couples.
rcle of 72 colours is not
tually exists, composed of
ɪhades are distinguished by
re are red, 1 red, 2 red, 3
red, &c. Each of the 72
er, 20 different degrees of
htest that can be discerned
o the most intense depth,
ɔwn and black. These de-
called tones or tints. The
ɪnes to the chromatic circle
ɪber of tints to 1440. To
these tints, we have merely
r of the shade, and after it
tone, as, for example, 3
. By mixing each of the
ɪy or black, so as to darken
es, a total of 14,440 colours
This part of the system is
ɪs unnecessary. Mr. O'Neill,
ctionary of Calico Printing
rhich work we refer the
ɔount of Chevreul's classifi-
ng list of colours and co-
h are pretty well defined in
with the names of the
to this ingenious system.
is list the following exam-

2 orange, 12 tone.
ue-violet, from 3 to 16

l, 13 and 14 tones.
orange, 2 to 3 tone.
7 tone.
e=5 orange, 18 tone.
en, 11 tone.
yellow-green, 8 tone.
w-orange.
, 8 tone.
w-orange, 20 tone.
one.
=1 yellow, 6 tone.
YES, PIGMENTS, &c., refer to
rs.
ent'ary. *Syn.* ACCIDENT'AL
rs are said to be comple-
other which, by blending
the perception of whiteness.
er, all colours are produced
of red, yellow, and blue
proportions; and by inter-
or more of these coloured
f light, those which meet
t of the remaining coloured
m. Thus, by intercepting
a beam *of white light, the*
d blue rays will produce a green colour; by intercepting the blue rays, the remaining yellow and red will give an orange; and so on of other cases; so that red and green, blue and orange, are COMPLEMENTARY COLOURS. If we look for some time, with one eye, on a bright-coloured object, as a wafer, placed on a piece of paper, and subsequently turn the same eye to another part of the paper, a similarly shaped spot or mark will be seen, but the colour will vary, though it will be always the same under like circumstances. Thus, if the original spot or wafer be of a red colour, the imaginary one will be green; if black, it will be white; the imaginary colour being always complementary of that first gazed upon. The colour so perceived is often called an ACCIDENTAL COLOUR, to distinguish it from the real colour. It is a general maxim in design that "colours look brightest when near their complementary colours."

Colours, Drug'gists' Show. See SHOW BOTTLES.

Colours, Flame. See FIRES (Coloured).

COLTS'FOOT. This popular herb is the *Tussilago farfara* of Linnæus. It is a demulcent bitter, and is slightly stomachic and tonic. It is much esteemed by the lower classes in coughs, shortness of breath, and other affections of the chest. The leaves form the basis of most of the British herb tobaccos, and have been recommended to be smoked in asthma and difficulty of breathing.—*Dose.* One or two wine-glassfuls of the tea or decoction (1 oz. to the pint) *ad libitum.*

COLUM'BIC ACID. See TANTALIC ACID.

COLUM'BIUM. See TANTALUM.

COMBINA'TION. In *chemistry*, the union of dissimilar substances. The great general laws which regulate all chemical combinations admit of being laid down in a manner at once simple and concise. The laws of COMBINATION BY WEIGHT are as follows:—

"1. All chemical compounds are definite in their nature, the ratio of their elements being constant.

"2. When any body is capable of uniting with a second in several proportions, these proportions bear a simple relation to each other.

"3. If a body, A, unite with other bodies, B, C, D, the quantities of B, C, D, which unite with A, represent the relations in which they unite among themselves, in the event of union taking place.

"4. The combining quantity of a compound is the sum of the combining quantities of its components." (Fownes.)

There is a remarkable relation between the specific gravity of a body in the gaseous state and its chemical equivalent or combining proportion—a relation of such a kind that quantities by weight of the various gases, expressed by their equivalents, or, in other words, *quantities by weight* which combine occupy, under *similar circumstances* of pressure and temperature, either equal volumes or volumes bearing a simple proportion to each other. This relation accounts for the law of COMBINATION BY VOLUME discovered by Gay-Lussac, and thus expressed:—

When gases combine, chemical union invariably takes place, either between equal volumes or between volumes which bear a simple relation to each other.

Gerhardt assumes that equal volumes of the elementary gases and vapours, when compared under similar conditions of pressure and temperature, contain the same number of atoms. See AFFINITY, ATOMIC THEORY, EQUIVALENTS, &c.

CONCENTRA'TION. The volatilisation of part of a liquid in order to increase the strength of the remainder. The operation can only be performed on solutions of substances of greater fixity than the menstrua in which they are dissolved. Many of the liquid acids, solutions of the alkalies, &c., are concentrated by distilling off their water.

In *pharmacy*, the term CONCENTRATED is commonly applied to any liquid preparation possessing more than the usual strength. Thus, we have concentrated infusions, decoctions, liquors, solutions, tinctures, and essences, most of which are made of 8 times the common strength. This is generally effected by using 8 times the usual quantity of the ingredients, with a given portion of the menstruum, and operating by digestion or percolation; the latter being generally adopted when the articles are bulky. When the menstruum is water, a little spirit is added, to make the product keep. See DECOCTION, INFUSION, &c.

CON'CRETE. A compact mass or cement, composed of pebbles, lime, and sand, employed in the foundations of buildings. The best proportions have been said to be—60 parts of coarse pebbles, 25 of rough sand, and 15 of lime; but Semple recommends 80 parts of pebbles, 40 parts of river sand, and only 10 parts of lime. The pebbles for concrete should not exceed about ½ lb. each in weight.

CON'DIMENTS. Substances taken with the food, to season or improve its flavour, or to render it more wholesome or digestible. The principal condiments are COMMON SALT, VINEGAR, LEMON-JUICE, SPICES, AROMATIC HERBS, OIL, BUTTER, SUGAR, HONEY, and SAUCES. Most of these, in moderation, promote the appetite and digestion, but their excessive use tends to vitiate the gastric juice, and injure the stomach.

CONFEC'TION. *Syn.* CONFECTIO, L. Anything prepared with sugar; a sweetmeat, or candy. In *medicine*, the name is commonly applied to substances, usually pulverulent, mixed up to the consistence of a soft electuary, with powdered sugar, syrup, or honey. In the 'London Pharmacopœia' (1836 and 1851) both CONSERVES and ELECTUARIES are included under this head, though there appears to be some little distinction them.

In the *preparation* of confections dry ingredients should be reduced to powder, and passed through a coarser than 80 holes to the inch; pulps and syrups used to mix them up be perfectly homogeneous, and of a consistence. The mixture should be and complete, in order that the che constituents may be equally dis throughout the mass. The consistenc newly made confection should be suf solid to prevent a separation of the dients, and yet soft enough to allo being easily swallowed without previ tication.

Confections should be *preserved* i jars covered with writing paper, and p a cool and not too dry a situation. W this precaution, they are apt to mould. top. If at any time the mass ferme swells up, the fermentative process may rested by placing the jar in a bath of water, for an hour or two, or until the becomes pretty hot; when it should moved from the heat, and stirred occas until cold. Should the sugar crystalli of the confection, or 'candy,' as it is the same method may be followed. O mass may be well rubbed in a mortar hard lumps of sugar are broken down, uniform consistence again produced. O large scale it may be passed throug mill.

As *remedial agents*, the officinal conf possess little value, and are chiefly vehicles for the administration of more medicines. See CONSERVES and E ARIES.

Confection of A'corns. *Syn.* CON SEM'INUM QUER'CUS, L. *Prep.* (B Powdered acorns, 3 oz.; red coral and c of each, 1½ oz.; confection of dog-rose. syrup of red roses, q. s. to make a conf —*Dose.* 1 dr., every 4 hours; in c diarrhœa, &c.

Confection of Al'monds. *Syn.* A PASTE, CONSERVE OF ALMONDS; CONF AMYG'DALÆ (Ph. L.), CONSER'VA AMYG RUM (Ph. E.), CONFEC'TIO AMYGDAL (Ph. D. 1826), L. *Prep.* (Ph. L.) almonds, 8 oz.; white sugar, 4 oz.; po gum arabic, 1 oz.; macerate the alm cold water, then remove the skins, them with the other ingredients until to a smooth confection. The Ph. E. similar.

Uses, &c. To prepare EMULSION OF ALMONDS. A little of this paste or triturated with a sufficient portion o and strained through a piece of calico emulsion of almonds. "This confect keep longer sound, if the almonds, fir ticated (blanched), dried, and rubbed i finest powder, be mixed with the

tely powdered, and the mixed in-
kept in a well-stoppered bottle."
e same effect may be arrived at
ell drying the blanched almonds
g them with the gum and sugar.
of even a small quantity of
rup causes the confection "to
mouldy, or rancid, or both."

of **Al'um.** *Syn.* CONFECTIO
. *Prep.* 1. (St. B. H.) Alum
der), 1 dr.; conserve of roses,

Alum, 1 dr.; conserve of roses, 1
1 dr., 2 or 3 times a day; in lead
an astringent in diarrhœa and
ns.

Aromat'ic. *Syn.* AROMATIC
CONFEC'TIO AROMAT'ICA (Ph. L.
UA''RIUM AROMAT'ICUM (Ph. E.),
L. (Ph. L.) Nutmegs, cinnamon,
on, of each, 2 oz.; cloves, 1 oz.;
½ oz.; prepared chalk, 16 oz.;
2 lbs.; reduce the whole to a
rder, and keep it in a closed vessel.
d for use, mix it with water to the
f a confection.
.) Aromatic powder (Ph. E.), 1
of orange peel, 2 parts; mix.
.) Aromatic powder and simple
ch, 5 oz.; clarified honey, 2 oz.;
ffron, ½ oz.; mix, and add, oil of
rops.
ercial.)—*a.* Hay-saffron, cassia,
ie, of each, 4 oz.; cardamoms,
h, 8 oz.; precipitated chalk, 2 lbs.;
r, 4 lbs.; oil of nutmeg, 2 drs.; oil
drs.; reduce the dry ingredients to
r, and pass it through a sieve (80
en add the oils, and after well
em in, pass the whole through a
e (about 40 holes to the inch), to
fect admixture.
affron, 4 oz.; turmeric, 3 oz.; pow-
h, 8 oz.; precipitated chalk, 2 lbs.;
r, 4 lbs.; oil of cloves and cassia, of
.; oil of nutmeg, 2 drs.; essence of
, 1 oz.; boil the saffron turmeric in
f water, placed in a bright copper
) minutes, then, without straining,
halk, starch, and sugar; mix well,
me stirring until the mixture be-
te stiff, then break it up, dry it
by the heat of a steam or water
d reduce it to fine powder, which
ssed through a fine sieve, as before;
d tincture are now to be added, and
well mixed, and passed through a
e, it should be placed in a jar or
l bunged up close. Very bright

the wholesale trade this article is
r two forms—one, in powder, as
the College, and commonly called
[illegible] PULV'IS *CONFECTIO'NIS*
y the other, mixed up ready for

use. In preparing the latter, it is a common plan to make a strong infusion or decoction of the saffron, and to use it to mix up the other ingredients, adding the aromatics last. (See 4, *b.*) When the price of precipitated chalk is an objection to its use, prepared chalk may be used instead. There is much anxiety evinced by the wholesale druggists to prepare this confection of a rich colour, without an undue expenditure of saffron, which is generally economised on account of its costliness. This confection is cordial, stimulant, antacid, and carminative.—*Dose.* 10 to 60 grs., either as a bolus or stirred up with a glass of water; in diarrhœa, acidity of stomach, heartburn, and any like affection, if accompanied by looseness of the bowels. In diarrhœa, English cholera, and flatulent colic, ¼ gr. of powdered opium may be added to each dose.

Confection of Bark. *Syn.* CONFEC'TIO CINCHO'NÆ, L. *Prep.* 1. Yellow bark and white sugar, of each, 1 oz.; capsicum, 1 dr.; simple syrup, 4 oz.

2. (St. B. Hosp.) Yellow bark, 6 drs.; ginger, ½ dr.; treacle, 3½ oz.—*Dose.* 1 to 6 drs., where the use of bark is indicated.

Confection of Cas'sia. *Syn.* CONFEC'TIO CAS'SIÆ (Ph. L.), L. *Prep.* (Ph. L.) Prepared cassia, ½ lb.; manna, 2 oz.; prepared tamarinds, 1 oz.; syrup of roses, 8 fl. oz.; mix with heat, and evaporate to a proper consistence.—*Dose.* 2 drs. to 6 drs.; or more, as a laxative.

Confection of Cat'echu. *Syn.* CONFEC'TIO CAT'ECHU COMPOS'ITA (Ph. D.), L. *Prep.* (Ph. D.) Compound powder of catechu, 5 oz.; simple syrup, 5 fl. oz.—*Dose.* 10 grs. to 20 grs.; as an astringent, in diarrhœa, &c.; either alone or combined with chalk.

Confection of Copai'ba. *Syn.* CONFEC'TIO COPAI'BÆ, L. *Prep.* 1. (Berton.) Copaiba and powdered cubebs, of each, 2 oz.; alum, 1 oz.; opium, 5 grs.; mix well.

2. (Swediaur.) Turpentine, 1 oz.; copaiba, ½ oz.; mix; add mucilage of gum arabic, 1 oz.; triturate to an emulsion, and further add, conserve of roses, 4 oz.

3. (Traill.) Copaiba, 2 oz.; oatmeal, q. s. to form an electuary; then add, conserve of roses, 1 oz.

4. (Voght.) Copaiba and powdered cubebs, of each, 4½ drs.; yolk of 1 egg; conserve of roses, ½ oz. All the above are excellent medicines in gonorrhœa.—*Dose.* 1 to 3 drs., three or four times a day, made into boluses, and covered with the fresh emptied skin of a prune before being swallowed; in gonorrhœa, gleet &c.

Confection of Cream of Tar'tar. *Syn.* CONFECTION OF BITAR'TRATE OF POTAS'SA; CONFEC'TIO POTAS'SÆ BITARTRA'TIS, L. *Prep.* 1. Cream of tartar and powdered sugar, of each, 1 oz.; simple syrup, 2 oz.; 1 nutmeg, grated. —*Dose.* 2 drs. to 6 drs.

2. (St. B. Hosp.) Bitartrate of potassa *and simple syrup, of each,* 3 oz.; ginger, 1 dr.

—*Dose.* 1½ dr. to 5 drs. Both are laxatives well adapted for women and children.

Confection of Hem'lock. *Syn.* CONFEC'TIO CO'NII, L. *Prep.* (Marshall Hall.) Fresh hemlock leaves beaten up with an equal weight of sugar.—*Dose.* 10 to 20 grs., as a bolus, 2 or 3 times daily, where the use of hemlock is indicated. The confection of other narcotic plants may be made in the same way.

Confection of Hips. *Syn.* CON'SERVE OF HIPS, CONFECTION OF DOG-ROSE, CONSERVE OF D.-R.; CONFEC'TIO RO'SÆ CANI'NÆ (Ph. L.), CONSER'VA RO'SÆ FRUC'TÛS (Ph. E.), L. *Prep.* 1. (B. P.) Hips, 1 part; refined sugar, 2 parts; heat the hips in a stone mortar, rub the pulp through a sieve, add the sugar, and mix thoroughly.—*Dose.* 60 grains or more.

2. (Ph. L.) Fruit of the dog-rose, without the seeds (carpels), 1 lb.; pound it to a pulp, add, gradually, powdered white sugar, 20 oz.; and beat them together until thoroughly incorporated.

3. (Ph. E.) Pulp of hips, 1 part; white sugar, 3 parts; as No. 1.

4. (Wholesale.) Pulped hips, 2 cwt.; fine white sugar, 3 cwt.; incorporate them without applying heat.

Obs. Both this and the confection of red roses have a brighter colour, if made without heat, or touching metallic vessels. On the small scale, it is generally made by beating the ingredients together in a marble mortar, but in large quantities by grinding in a mill. Great care must be taken to remove the seeds (carpels) with the hair surrounding them, before pulping the fruit, as they are apt, like the hairs of cowhage, when swallowed, to produce vomiting, itching about the anus, &c. This conserve is slightly laxative, and is principally used for forming pills. It is very apt to candy by keeping.

Confection of Ipecacuan'ha. *Syn.* CONFEC'TIO IPECACUAN'HÆ, L. *Prep.* (Bories.) Ipecacuanha, 12 grs.; sulphur, 20 grs.; orris root, 1 dr.; syrup of mallows and manna, of each, 2 oz.—*Dose.* A teaspoonful, 2 or 3 times daily; in hooping-cough, dyspepsia, &c.

Confection of Jal'ap. *Syn.* CONFEC'TIO JAL'APÆ, C. J. COMPOS'ITA, L. *Prep.* (St. B. Hosp.) Jalap, 4 drs.; ginger, 1 dr.; bitartrate of potassa, 3 oz.; treacle, 5 oz.—*Dose.* 1 to 3 drs., as a purgative.

Confection of Mer'cury. *Syn.* CONFEC'TIO HYDRAR'GYRI, C. MERCURIA'LIS, L. *Prep* 1. Stronger mercurial ointment (Ph. L.), 1 part; conserve of roses, 3 parts.

2. (Dr. D. Davis.) Mercury and manna, equal parts; treacle, q. s.; triturate until the globules of mercury disappear.

Dose, &c. The same as those of mercurial pill.

Confection of Ni'tre. *Syn.* CONFEC'TIO POTAS'SÆ NITRA'TIS, L. *Prep.* 1. Nitre, 1 part; confection of roses, 6 parts; oil of juniper, a few drops.

2. (St. B. Hosp.) As the last, without the *juniper.* Both are used in gonorrhœa.

Confection of O'pium. *Sym.* C
O'PII (B. P.), ELECTUA''RIUM O'PI
L. *Prep.* 1. (B. P.) Compound
opium, 192 grs.; syrup, 1 oz.

2. (Ph. L.) Powdered opium, 6
pepper, 1 oz.; ginger, 2 oz.; caraw
tragacanth, 2 drs.; reduce to fine p
keep it in a closed vessel; for use,
degrees, hot syrup, 16 fl. oz. (*i. e.,*
the powder to each fl. oz. of syrup
tains 1 gr. of opium in every 36 gr

3. (Ph. E.) Aromatic powder, 6 o
3 oz.; opium, diffused in a little sh
syrup of ginger, 1 lb. Contains 1 g
in every 43 grs.

Uses, &c. This confection is int
substitute for the once celebrated
philonium, and theriaca of the old
pœias. It is stimulant, anodyne, a
—*Dose.* 5 to 30 grs.; in flatulent
diarrhœa unaccompanied by fever.

Confection of Or'ange Flow'ers.
FEC'TIO FLOR'UM AURAN'TII, L.
Orange flowers, 1 part; white sug
beat together to a confection.

2. (Tadei.) Orange flowers, 1 p
syrup, 3 parts; evaporate to a p
sistence. Both are used as agreeab
or vehicles for other medicines. T
the best article.

Confection of Or'ange Peel. *Sy*
TION OF ORANGE, CONSERVE OF ORA
CONFEC'TIO AURAN'TII (Ph. L.),
AURAN'TII (Ph. E.), CONSER'VA
TIO''RUM (Ph. L. 1824), L. *Pre*
and E.) External rind of the fre
separated by rasping, 1 lb.; beat it
mortar with a wooden pestle to a
add, white sugar, 3 lbs.; and beat the
until incorporated.

Uses, &c. This confection is an
tonic and stomachic; it is much u
adjunct to bitter and purgative po
as a vehicle for the sesquioxide of ir

Confection of Pep'per. *Syn.* CONF
BLACK PEPPER, CONSERVE OF B. P.;
PASTE; CONFEC'TIO PIP'ERIS (B.
NI'GRI (Ph. D. & Ph. L. 1836),
A''RIUM PIP'ERIS (Ph. E.), L. *Prep.*
Black pepper, in fine powder, 2 pa
way, in fine powder, 3 parts; clarifi
15 parts; triturate.—*Dose.* 60 to 1

2. (Ph. L.) Black pepper and elec
each, 1 lb.; fennel, 3 lbs.; white sug
reduce to a very fine powder, and k
covered vessel; for *use,* add it, gra
honey, 2 lbs.; and beat the whole
(*i. e.,* 2 oz. of honey to each 7 oz. of

3. (Ph. E.) As the last, but usin
powder instead of elecampane, and
making a confection.

4. (Ph. D.) Black pepper and
root, of each, ½ oz.; refined sugar,
of fennel, ½ fl. oz.; honey, 2 oz.; mi
of each of the above, 1 to 8 drs., tw
times daily, for 3 or 4 months;

ccompanied with inflammatory
, it may be used as a sup-
intended as a substitute for
ated nostrum, 'Ward's Paste

Pep'permint. *Syn.* CONFECTIO
RI'TÆ, L. Green peppermint,
igar, 12 oz. Anti-emetic and
in colic, diarrhœa, &c.; in the
, or made into a mixture.

Res'in. *Syn.* CONFEC'TIO
rep. (Dr. Watson.) Powdered
lsam of copaiba, ½ oz.; honey,
to 3 drs.; in piles and gleet.
ned with a little confection of
iich effectually covers the taste

Ro'ses. *Syn.* CONFECTION OF
ONFEC'TIO RO'SÆ (Ph. L. & D.),
SÆ (Ph. E.), CONFECTIO RO'SÆ
P.), CONSERVA R. G. (Ph. L.
ep. 1. (B. P.) Fresh red-rose
vhite sugar, 3 lbs.; mix as con-

Fresh petals, 1 part; sugar,

-*a.* Fresh petals, 3 oz.; sugar,

als, 1 oz.; water, 2 fl. oz.; mace-
rs; then add refined sugar, 8 oz.;
mass, as before.
astringent and tonic, but is
ed as an elegant vehicle for more
ses. It keeps well, and does not
nfection of hips.—*Dose.* 1 to 2
a spoon, either alone or combined
n slight cases of diarrhœa, vomit-
ncy, &c. See CONSERVE.

of Rue. *Syn.* CONFECTIO RU'TÆ
Prep. (Ph. L.) Fresh rue (bruised),
d laurel berries, of each, 1½ oz.;
gapenum, ½ oz.; black pepper,
y, 16 oz.; water, q. s.; rub the
nts to a fine powder, then add,
e sagapenum, previously dissolved
r and honey over a slow fire, and
in the Ph. L. 1836, dried rue was
rminative and antispasmodic. In
ic, and in the convulsions of chil-
there is no inflammation.—*Dose.*
rs.; either by the mouth, or made
a with gruel.

of Scam'mony. *Syn.* CONFEC'TIO
I (B. P.), ELECTUA"RIUM SCAM-
L. D.). *Prep.* (B. P.) Scammony,
der, 24 parts; ginger, in fine pow-
ts; oil of caraway, 1 part; oil of
rt; syrup, 24 parts; clarified honey,
rub the powders with the syrup and
into a uniform mass, then add the
ix.—*Dose.* 10 grs. to 30 grs.; as a
rtic, and in worms, &c.

of Sen'na. *Syn.* LEN'ITIVE ELEC'-
EC'TUARY OF SENNA; CONFEC'TIO
h. L. & D.), ELECTUA"RIUM SEN'-
), L. *Prep.* 1. Senna, 8 oz.; cori-anders, 4 oz.; rub them together, and by a sieve separate 10 oz. of the mixed powder; also boil figs, 1 lb., and fresh liquorice, bruised, 3 oz., in water, 3 pints, until reduced to one half; press, strain, and evaporate the strained liquor in a water bath to 24 fl. oz.; then add sugar, 2½ lbs.; dissolve, and further add, prepared tamarinds, cassia, and prunes, of each, ½ lb.; remove from the heat, and when the whole has considerably cooled, add the sifted powder, by degrees, and stir until the whole is thoroughly incorporated.

2. (Ph. E.) Senna, 8 oz.; corianders, 4 oz.; liquorice root, 3 oz.; figs and pulp of prunes, of each, 1 lb.; white sugar, 2½ lbs.; water, 3½ pints.

3. (Ph. D.) Senna leaves, in fine powder, 2 oz.; corianders (in fine powder), 1 oz.; oil of caraway, ½ dr.; mix, and add them to pulp of prunes, 5 oz.; pulp of tamarinds, 2 oz.; brown sugar, 8 oz.; water, 2 fl. oz.; previously brought to a smooth paste by the heat of a water bath.

Uses, &c. Confection of senna is a gentle and pleasant purgative, and well adapted for persons suffering from piles, and as a laxative during pregnancy. The dose is 1 dr. to ½ oz., taken at bedtime or early in the morning.

Obs. There is no one pharmacopœial preparation which it is more difficult to obtain of good quality than confection of senna. The absolute cost of an article prepared according to the directions of the Colleges, is greater than the price at which many wholesale houses are vending the drug. Dr. Paris very truly remarks that, "the directions of the Pharmacopœia are very rarely followed." Considerable quantities are manufactured, into which unsound and spoilt apples enter as a principal ingredient; whilst the substitution of jalap for the whole, or a portion of the senna, is a very common practice. We have seen the following forms employed in the trade.

4. Powdered senna, pulp of tamarinds, cassia, and prunes, of each, 1½ lb.; powdered corianders, ¾ lb.; Spanish juice, ½ lb.; simple syrup, 12 lbs.

5. As the above, but omitting the cassia pulp, and adding 2 lbs. more tamarind pulp. Both these articles are labelled "P. L." and sent out as genuine, and that when no competition as to price exists. The cheaper article is made as follows:—

6. Common prunes and tamarinds, of each, 16 lbs.; treacle, ¾ cwt.; species (a compound of senna dust and small senna, mixed with 3 lbs. of coriander seeds, and strengthened with jalap; all ground to a fine powder), 18¼ lbs. To this is frequently added, of rotten or inferior apples, ¼ cwt., which are pulped with the prunes and tamarinds. This article is commonly labelled "CONF. SENNÆ VER." by its manufacturer.

Confection of Sponge. *Syn.* ELEC'TUARY OF BURNT SPONGE; CONFEC'TIO SPONGII, C. S. US'TÆ, L. *Prep.* 1. Burnt sponge, 3 parts; *confection of orange peel and hips, of each, 1 part; simple syrup,* q. s.

2. (St. B. Hosp.) Burnt sponge, made into a confection with syrup of orange peel. The first form produces the most agreeable confection.—*Dose*, of either, ½ dr. to 2 drs., twice or thrice daily; in scrofula, &c.

Confection of Steel. *Prep.* 1. CONFEC'TIO FER'RI SESQUIOX'IDI, L.—*a.* From confection of orange and sesquioxide of iron (Ph. L.), of each, 2 oz.; white sugar, 3 oz.; syrup, 1½ oz.; mix.—*Dose.* 1 dr. to 3 drs.

b. (St. B. Hosp.) Sesquioxide of iron, 1 oz.; treacle, q. s.—*Dose.* ½ dr. to 1 dr. Both are given in the usual cases wherein iron is indicated; especially in anæmia, chlorosis, and amenorrhœa.

2. (CONFEC'TIO FER'RI TARTARIZA'TI,—St. B. Hosp.) Cream of tartar, 1½ oz.; tartrate of iron, 2 drs.; ginger, 1 dr.; treacle, 2½ oz., or q. s.—*Dose.* 1 dr. to 2 drs., 2 or 3 times daily.

Confection of Sul'phur. *Syn.* BRIMSTONE AND TREACLE; CONFEC'TIO SULPHU'RIS, L. *Prep.* 1. Sublimed sulphur, 2 oz.; treacle, 4 oz.—*Dose.* A spoonful night and morning for a week or longer, as an alterative or purifier of the blood; in skin diseases, &c.

2. (St. B. Hosp.) Precipitated sulphur, 1 oz.; cream of tartar, 2 drs.; honey or treacle, 2 oz. As the last.

3. (B. P.) Sublimed sulphur, 4 oz.; cream of tartar, 1 oz.; syrup of orange peel, 4 fl. oz.—*Dose.* 1 to 2 drs.; as a laxative, in piles, gonorrhœa, &c.

Confection of Tin. *Syn.* CONFEC'TIO STAN'NI, L. *Prep.* (Hosp. Form.) Powdered tin, 1 oz.; confection of roses, 2 oz.; mix.—*Dose.* 2 to 4 drs., every morning; in worms.

Confection of Turpentine. *Syn.* CONFEC'TIO TEREBINTH'INÆ, L. *Prep.* (B. P.) Oil of turpentine, 1 fl. oz.; liquorice powder, 1 oz.; triturate together, then add clarified honey, 2 oz.—*Dose* and *use*, as the last.

Confection of Worm-seed. *Syn.* CONFEC'TIO CIN'Æ, C. S. CINÆ, L. *Prep.* 1. (Ph. Slesvico-Holsat. 1831, and Ph. Suec. 1845.) Worm-seed, 2 oz.; heat it in a pan over a gentle fire, add white sugar, boiled to a low candy height, 4 oz.; and stir together until they become dry; then pick out those seeds which are covered with sugar, and repeat the process with the others.

2. Powdered worm-seed and syrup of orange peel, equal parts.—*Dose.* 1 to 2 drs., night and morning, followed by a brisk purge; in worms.

CONFEC'TIONERY. See CANDIES, DROPS, LOZENGES, SUGAR, &c.

CONGELA'TION. The conversion of a substance from the fluid to the solid state by the abstraction of heat. See ICE and REFRIGERATION.

CONGLU'TINUM (Bracy Clarke's). Sulphate of zinc (white vitriol), 4 oz.; dissolved in water, 1 pint. *Used* as an astringent lotion in veterinary practice, and, much diluted with water (a dessert-spoonful to ¼ pint or more of water), as a collyrium in chronic inflammation of the eyes.

CO'NIA. $C_8H_{15}O$. *Syn.* Co
CINE. An alkaloid, discovered
hemlock. It exists in every
plant, but is present in the larg
the seed.

Prep. (Gieger.) The seeds o
their alcoholic extract, is distil
and potassa. The conia passes
receiver, and floats on the top
which also contains a little coni
It is purified in the way directe
tile bases. (See ALKALOID.)
holic extract is employed, about
of potassa should be used.

Prop., &c. Pure conia is a
liquid, smelling intensely of hem
of a combination of the odours o
mice; volatile at common temp
dens turmeric; boils at about
readily distils over with water a
·89; with the acids it forms
which are crystallisable. 6 lbs
9 lbs. of dried seeds yielded 1
(Gieger.) 40 lbs. of the ripe b
yielded 2½ oz. of hydrated conia.

Conia is remarkably poison
placed in the eye of a rabbit,
minutes; 5 drops, poured into t
dog, killed it in less than a mi
been employed in some convuls
modic diseases, but is now seldo
cinally. "The plaintive cries, th
and the rigidity of the limbs
always preceded death (caused b
no doubt as to the cruel pains w
of poisoning brings on." (Bo
and Henry.) The *treatment* m
commended under ACONITE and

CON'SERVE. *Syn.* CONSER'V
vegetable matter, as flowers, herb
and seed, beaten with powdered
consistence of a stiff paste, so a
them, as nearly as possible, in
freshness. Conserves are made
confectioner and the druggist; b
SWEETMEATS; by the other, ch
cles for more active medicines.
College of Physicians now includ
serves and electuaries under the
of CONFECTIONS. The term a
ever, in some cases, scarcely appr
word confection has a more ge
tion, and implies any sweatmeat
tion in which sugar is the princip
See CONFECTION and ELECTUAR

Conserve of Ac'etate of Potas's
SER'VA POTAS'SÆ ACETA'TIS, L.
Acetate of potassa, ½ oz.; sulp
1 dr.; juices of scurvy grass,
dandelion, of each, 2 oz. (reduc
by gentle evaporation?); sugar,
a conserve. A teaspoonful, 2 or
as a diuretic aperient; in obstr
bowels, &c.

Conserve of Al'monds. See Co

Conserve of Angel'ica. Sy

Prep. (Giordano.) Fresh an-
parts; water, 16 parts; mace-
hours, clarify the liquor, add
; cook the root in the syrup, and
his state (confection), or dry it
Used as an agreeable tonic, sto-
rminative.

ntiscorbu'tic. *Syn.* CONSER'VA
CA, L. *Prep.* (Selle.) Horse-
ress, and water-trefoil, orange-
sh-juice, equal parts; powdered
q. s. to make a conserve. In

A''rum. *Syn.* CONSER'VA A''RI,
RI, L. *Prep.* From fresh arum
w-pint or wake-robin), ¼ lb.;
As a diuretic and attenuant in
a expectorant in chronic coughs.
spoonful, gradually increased.

Broom. *Syn.* CONSER'VA SCO-
rep. (Van Mons.) Broom flowers,
r, 2 parts.—*Dose.* ½ to 2 tea-
r 3 times a day; in dropsy, gout,
kc.

Hips. See CONFECTION.

f Lavender. *Syn.* CONSER'VA
, L. Lavender flowers, 1 part;
mp sugar, 3 parts; beaten to-
smooth paste. *Used* to sweeten
In a similar way conserves are
various other leaves and flowers;
with only twice their weight of
they are not very odorous or

f Lem'on Peel. *Syn.* CONSERVA
L. CORT'ICIS, L. As CONFECTION
PEEL.

f Mal'lows. *Syn.* CONSER'VA
From the flowers, as CONSERVE
OR.

f Or'ange Peel. See CONFECTION.

f Pep'permint. See CONFECTION.

f Rose'mary. *Syn.* CONSER'VA
, L. As CONSERVE OF LAVENDER.

f Roses. 1. See CONFECTION.
ULA'TED CONSERVE OF ROSES.
SÆ AC'IDA, L.) *Prep.* (Hosp. F.)
f roses and powdered gum, of each,
ric acid, 1 dr. to 1½ dr.; (diluted
, 2 drs. An excellent substitute for

f Sav'in. *Syn.* CONSER'VA SA-
Prep. (Ph. Han.) Fresh savin,
r, 2 parts. As an emmenagogue,
hœa, &c. Three parts of sugar
ter conserve.

f Scurvy Grass. *Syn.* CONSER'VA
E, C. C. HORTEN'SIS, L. *Prep.*
1836.) Fresh scurvy grass, 1 lb.;
Stimulant and antiscorbutic.

f Sea Worm'wood. *Syn.* CON-
H'II MARIT'IMI, L. *Prep.* (Ph.
From sea wormwood, as the last.
ble bitter and vermifuge; in dys-

[illegible] *Syn.* CONSER'VA PRU'NI SYLVES'TRI, L. *Prep.* (Ph. L. 1788.) From the pulp of the fruit, 1 part; sugar, 3 parts. Astringent. Useful in simple diarrhœa, &c.; either alone or combined with chalk.

Conserve of Squills. *Syn.* CONSER'VA SCIL'LÆ, L. *Prep.* (Ph. L. 1788.) Fresh squills, 1 oz.; sugar, 5 oz. Diuretic, attenuant, and expectorant; in dropsy, chronic coughs, &c.—*Dose.* 10 to 20 grs.

Conserve of Tam'arinds. *Syn.* CONSER'VA TAMARIND'ORUM, L. *Prep.* (P. Cod.) Tamarind pulp, 2 oz.; white sugar, 3 oz.; evaporate by the heat of a water bath to the consistence of honey.

Conserve of Vi'olets. *Syn.* CONSER'VA VIO'LÆ, C. V. ODORA'TÆ, L. *Prep.* (Soubeiran.) Flowers, 1 part; sugar, 3 parts; beat to a paste. Demulcent and laxative; used as a purge for infants, and by ladies to perfume the breath.

Conserve of Wa'ter-cress. *Syn.* CONSER'VA NASTUR''TII, L. *Prep.* (Ph. Græca, 1837.) From fresh water-cresses, as the last. In scurvy; taken *ad libitum.*

Conserve of Worm'wood. See CONSERVE OF SEA WORMWOOD.

CONSTIPA'TION. *Syn.* CONSTIPA'TIO, OBSTIPA'TIO, L. Surgeons distinguish between costiveness and constipation. The first applies to that condition of the body in which the bowels act tardily, and in which the fæces are abnormally and inconveniently indurated; the last implies the absence of the proper alvine evacuations. The one rapidly undermines the health; the other destroys life in a period varying from a few days to 3 or 4 weeks. In popular language, however, the words are frequently used synonymously. The use of bread containing alum, and water containing much lime (very hard water), and the want of sufficient exercise, are common causes of constipation.

Treatment. When the affection is merely accidental or occasional, a dose of some aperient or cathartic is the only treatment necessary; but when it is habitual it calls for further attention. Great benefit may generally be secured by adopting a diet free from astringents, and consisting of a large portion of green vegetables and ripe fruit; particularly avoiding the use of over-cooked, salted, or dried animal food. Brown bread may be eaten, as it acts as a gentle laxative, from the bran it contains. The occasional use of aperient and emollient enemata may be had recourse to; but their habitual administration, as well as that of purgative medicines generally, by the mouth, is not to be recommended. The bowels, accustomed to the continual use of stimulants, act but languidly or scarcely at all without their application. In females, especially of the higher classes, the want of proper exercise is commonly the chief cause of this affection. With such persons, a short walk, two or three times *daily, will often do* wonders, particularly if a *little ripe fruit,* a few raisins or tamarinds, or, still better, 2 or 3 drum figs, be occasionally eaten. In some cases of obstinate constipation a cold-water dressing, placed over the pit of the stomach or the abdomen, will cause the bowels to act in the course of an hour or two. When the inactivity of the bowels arises from a deficiency of bile (one of the most common causes), no remedy is more natural, or more effective, than inspissated ox-gall. In cases complicated with nervous, hypochondriacal, or hysterical affections, in chlorosis, dyspepsia, depraved appetite, and numerous other ailments, this remedy frequently succeeds, after the most active articles of the materia medica have been tried in vain.

In the treatment of the constipation of infants, castor-oil (½ teaspoonful occasionally), or manna (¼ to ½ oz., sucked at will), may be given. The introduction (very gently) of a little slip of writing paper, parsley stalk, or suet, is a method sometimes adopted successfully by nurses. Friction on the stomach and bowels with the warm hand, or a piece of soft flannel, should also be employed. See GALL, PURGATIVE, &c.

CONSUMP'TION. See PHTHISIS.

CONTA'GION. See DISINFECTANT.

CONTU'SION. A hurt, or injury to the flesh, such as might be caused by a blunt instrument or by a fall, without breach or apparent wound. For *treatment*, see BRUISE.

COPAI'BA. *Syn.* COPAI'VA, COPAIVA BALSAM, CAPIV'I, BALSAM OF CAPIV'I; COPAI'BA (Ph. L. E. & D.), L.; BAUME DE COPAHU, Fr.; COBAIVA BALSAM, Ger. "The oleo-resin, of a brown colour, obtained by incision from the trunk of *Copaifera multijuga.*" (B.P.) Most of the balsam of commerce is obtained from Para and Maranhao. It is packed in casks containing from 1 to 1¼ cwt. each, or in large bottles, or in cylindrical tin boxes.

Prop., Purific., &c. Copaiba, though usually called a 'balsam,' is not correctly so named, as it contains no benzoic or cinnamic acid. It is correctly described in the B. P. as an 'oleo-resin.' Considerable variation exists in the colour, odour, consistence, and transparency, as well as in the proportion of oil and resin yielded by different samples, scarcely any two of which exactly agree. The sp. gr. varies from ·950 to ·996. Brazilian copaiba is thin, clear, and pale; whilst the West Indian variety is thick, golden yellow, less transparent, and has a less agreeable and somewhat terebinthinate smell. Some varieties are opaque, and continue so unless filtered. This is often a most troublesome operation. The opacity generally arises from the presence of water, which it retains with great tenacity. The following is the plan we have found to answer on the large scale:—Place the casks upon their ends in a warm situation, and leave them so for 10 days or a fortnight, or longer, if convenient. They may then be tapped a little above the bottom, when the contents of some of them will generally be found quite transparent, and may be drawn off a
being taken to avoid shaking
The copaiva that remains foul n
through one or more long Canto
sunk in the bottom of a tin
over a suitable receiver, in a
that adopted for oils; a few pou
powdered charcoal being mixe
first 5 or 6 gallons thrown
rapidly fill up the pores of the
the balsam soon flow clear a
"bottoms" of the casks, contai
and impurities, may be poure
can or jar, and allowed to settle
when the copaiba may be pour
and filtered. A sudden change
will frequently turn a transpar
this article opaque or milky; it
fore, deemed fit to send out
sale trade, unless it stands t
ascertain this point, a common
fill a small bottle with the c
leave it out of doors all night
situation.

Pur., Tests, &c. This substan
adulterated; indeed, fully one
for copaiba does not contain 10
balsam. This is particularly
that sold in capsules, at low
shops. Pure balsam of copaiba
nised by the following character

1. (Ph. E.) It is transpa
turpentine odour when heate
2 parts of alcohol; and dissolv
of its weight of carbonate of
the aid of a gentle heat, and co
lucent.

2. (Chevallier.) A drop of the
on a piece of unsized paper, an
all the essential oil is expelled,
transparent, well-defined spot; bu
has been adulterated with a fatt
rounded by an oily areola.

3. (Planche.) 2½ parts of b
with 1 part of solution of am
·965, forms a mixture which
and transparent in a few mome
be heated to 212° Fahr. with
opaque.

4. (Vigne.) Boiled with 50 ti
of water for 1 hour, it should lo
its weight.

5. (Adder.) By agitating
sample with a lye of caustic so
the mixture aside to repose, th
a time rises to the surface,
oil present (if any) forms a soa
below.

6. ('Journ. de Pharm.,' 1842.)
may be adulterated with 50 per
oil (nut, almond, or castor oil
ceasing to give a clear solutio
of alcohol; but it combines ba
nesia and ammonia. Excess of
ever, separates the oil in all ca
test for detecting the fat oi

rhich some caustic potash has

sam of copaiba is considered
.ry, diuretic, and astringent;
ss a sort of specific power
he mucous membranes of the
;ans. It is hence a favorite
rhœa, as soon as the first in-
ptoms have subsided, anti-
oothing measures being pre-
—*Dose.* 20 to 60 drops on
water, or made into an emul-
of egg or gum arabic, 3 or 4
e stomach will bear it. The
drops of sweet spirits of nitre
have been recommended, to
. By adding 1 dr. of oil of
tii) to each oz. of the balsam,
es far from disagreeable, and
the stomach. Copaiba is also
es and pills. See CAPSULES,
PILLS, &c.

us preparations of this article
such names as 'soluble co-
solution,' 'salt of copaiba,'
ese appear to possess equal
rtainty of operation to the
. As the whole virtue of
licine depends on the essential
he value of any of these pre-
e estimated by the quantity of
ch is found in them. In the
two articles above named, the
small indeed, and in the last
cient.

forms are current in the trade
on (adulteration) of balsam of

copaiba, 4 lbs.; castor oil, 3 lbs.;

lbs.; castor oil, 4 lbs.; yellow

rts of balsam of copaiba and

t add, Venice turpentine, 1 lb.
f Canada and copaiba, and nut
ual parts.
lbs.; nut oil, 3 lbs.; yellow resin,
balsam, 1 lb. *Used* to fill the
; and to sell in the lower parts
in the manufacturing districts.
TIOUS COPAIBA (*below*).
ti''tious. *Syn.* COPAI'BA FAC-
IUM COPAI'BÆ FACTI''TIUM, L.
or oil (warm), 7 quarts; copaiba
art; mix, and filter through

l, 1 gal.; yellow resin, 3 lbs.;
, 2 lbs.; oil of juniper, 2 oz.;
l oz.; essences of orange and
h, ½ oz.; powdered benzoin,
the resin with the castor oil
nd when nearly cold add the

lsam, 9 lbs.; *castor oil, 7 lbs.;*
lb.; Venice turpentine, 2 lbs.; oils of rosemary, juniper, and savin, of each, 1 dr.; essential oil of almonds, 20 drops.

4. Canada balsam, 3 lbs.; Venice turpentine, 1 lb.; oils of fennel, juniper, and savin, of each, q. s.

Used chiefly to fill capsules. It is readily distinguished from balsam of copaiba by the proper tests. (See *above.*) Train oil or nut oil is frequently substituted for the castor oil.

Copaiba and Ka'li. *Syn.* COPAIBA CUM POTASSÂ, L. *Prep.* Carbonate of potassa and water, of each, equal parts; dissolve, and add, gradually, transparent balsam of copaiba, until the fluid, at first milky, turns quite clear. Resembles miscible copaiba (see *below*).

Copaiba, Mis'cible. *Prep.* From balsam of copaiba (pure and transparent), mixed with half its volume of solution of potassa made of double the strength ordered in the B. P.

Obs. As different samples of copaiba often require slightly different quantities of the solution of potassa, it is best to mix the two gradually and cautiously together. Should the mixture be opaque, a little more of one or other of the ingredients, as the case may be, will render it clear. No heat must be used. This article is miscible with water, with which it forms a kind of milk; and from containing all the volatile oil of the copaiba, is a very valuable preparation. Its activity is considered equal to that of the balsam itself, and it is given in similar doses.

Copaiba, Sol'uble. *Syn.* COPAI'BA SOLUBIL'IS, L. *Prep.* 1. Heat miscible copaiba in an earthen, glass, or bright-tinned copper vessel, to nearly the boiling-point, pour it while still hot into a separator, cover it up, and allow it to cool very slowly. After a few days, draw off the clear portion from a cock or hole placed at or near the bottom of the vessel, observing to reject the first few drops which pass through, and to stop the stream before any of the floating oil (*oleum copaibæ*) reaches the orifice. A very little concentrated liquor of potassa, added before applying the heat, renders it more soluble. Thick, transparent, soluble in pure water, and resembles the natural balsam in appearance.

2. Balsam of copaiba and solution of potassa (B. P.), equal parts, by volume; mix, boil for a few minutes, and then proceed as before. Thinner than the last.

Prop. Less powerful than miscible copaiba, but it sits better on the stomach, and is about four times as strong as specific solution of copaiba. See SOLUTION.

Copaiba, Res'in of. *Syn.* COPAI'BÆ RESI'NA, L. The residuum of the process of distilling the oil of copaiba from the balsam. It consists principally of copaibic acid. It has been recommended for gonorrhœa, but is nearly inert, even in ¼ oz. or ¾ oz. doses. See OIL.

Copaiba, Salt of. *Syn.* SAL COPAI'BÆ, L. *There are two preparations* sold under this *name; the one, crude* copaibic acid; the other, dens litmus paper, and forms salts with the bases, called copaibates.

COPAL. *Syn.* Copal′, Gum copal. A resinous substance, which exudes spontaneously from various trees belonging to the genera *Hymenæa*, *Guibourtia*, and *Trachylobium*. The varieties commonly met with in commerce are East Indian copal, or anime, which is the produce of *Hymenæa Courbaril*, and West Indian copal, obtained from numerous species.

Prop. When of good quality, it is too hard to be scratched by the nail, has a conchoidal fracture, and a sp. gr. ranging from 1·059 to 1·072. Unlike other resins, it is dissolved with difficulty by alcohol and essential oils; and this property, combined with its extreme hardness, renders it very valuable for making varnishes. See Varnish.

COP′PER. Cu. *Syn.* Cu″prum, L.; Cuivre, Fr.; Kupfer, Ger.

Sources. Metallic copper (native copper) is found in many parts of the globe, diffused in isolated particles in the form of thin laminæ, in loose grains intermixed with quartz (copper sand, copper barilla), in dendritic pieces, and in solid blocks, occasionally of many tons weight. The richest deposits of native copper are those of Lake Superior, in North America. More frequently and more abundantly it occurs as an ore, *e. g.* red oxide, black oxide, green carbonate of copper or mal′achite, blue carbonate of copper, vitreous sulphide of copper, purple copper, copper pyrites, or yellow copper ore, with sulphur, antimony, or arsenic, and other metals (true gray copper ore or fahl′erz), as an impure hydrated silicate

of air in a calciner, and a consid
of sulphur is expelled. 4. The ca
lated, coarse metal is melted, wit
of matters rich in oxides of co
'roaster' and 'refinery slags' (
remaining operations, Nos. 5 a
ively), and native carbonates of c
containing oxide of copper. The
a regulus, termed 'metal,' wh
about 75% of copper, and metal sla
The metal should be in the st
metal,' compact and brittle, wi
metallic lustre and a dark bluish
It is tapped off into sand moulds.
of regulus obtained by the last
roasted in a furnace through whi
The temperature is so regula
regulus may be melted in from 6
The slag is skimmed off, and afte
heat is lowered, to allow the regul
It is again melted and tapped into
the product being called 'bli
6. This, the last operation, is term
From 6 to 8 tons of blister coppe
melted in a furnace, and kept expo
15 hours to the oxidising influenc
The slag is skimmed off through
ing. When the oxidation has bee
prolonged, anthracite or free-burn
pure as possible, is thrown upon t
the metal, and after a short time t
of a long birch or oak pole is plun
molten mass. This part of the
termed 'poling.' The wood in c
the copper is rapidly decomposed;
evolved, which causes the metal to
about and every part of it to be

d by decomposing sulphate of
electrotype apparatus. It does
ead, whereas most varieties of
pper do contain that metal.

R-SHOT COPPER, GRANULATED C.
lading the refined copper from
to cold water. In small pieces,
ed edge. *Used* to make calamine,
of copper, &c.

IN PLATES OR FOIL. Those of
st, annealed) are generally em-

IN POWDER.—*a.* A solution of
opper is heated to the boiling-
cipitated with distilled zinc; the
opper is then separated from the
by dilute sulphuric acid, washed
nd dried by exposure to a mode-
ure.

Copper has a brilliant yellowish-
nauseous, styptic taste, and emits
e odour when rubbed; is very
ductile; unchanged in dry air;
it soon becomes covered with a
(carbonate of copper); slightly
lute sulphuric and hydrochloric
luble in boiling oil of vitriol (sul-
ydride being evolved); dilute
issolves it readily with copious
nitric oxide; heated to redness
it rapidly becomes covered with
(oxide); it fuses at a full red
ystals are either octahedra or
sp. gr. 8·8 to 8·96; it forms
mpounds (alloys and salts) with
all of which are more or less poi-
alts are either blue or green, and
s (when neutral) are soluble in

tallic copper may be recognised
properties; its oxides, salts, &c.,
wing characters and reactions:—
s of copper possess a blue or green
h they retain even when consider-
with water:—With caustic potassa
light-blue, bulky precipitate, turn-
-brown or black on boiling the
monia and carbonate of ammonium
lish-white precipitate, soluble in
ing a rich deep-blue solution:—
tes of potassium give a like preci-
luble in excess:—Ferrocyanide of
ives a reddish-brown precipitate:—
d hydrogen and sulphydrate of am-
e blackish-brown or black ones:—A
of iron, on immersion in an acidu-
on, quickly becomes coated with
per.

Copper is generally WEIGHED
rm of black oxide, but sometimes
l:—By throwing it down from its
pure potassa, after which it must
collected, washed, dried, ignited
n crucible, and weighed therein as
cold. Every 5 parts of the *ignited*
(oxide) *represents 4 parts of copper* (nearly); or, more accurately, every 39·7 parts are equal to 31·7 of pure metallic copper:—By immersing a piece of polished steel in the solution, and weighing the resulting precipitate of the copper (see *above*). Less delicate than the preceding.

Copper can be separated from the other metals by means of the following processes:—

From lead. By adding sulphuric acid to the nitric solution, and evaporating to dryness, when water digested on the residuum will dissolve out the sulphate of copper, but leave the sulphate of lead behind. From this solution the oxide of copper may be thrown down as before.

From tin. By digestion with hot nitric acid, which dissolves out the tin.

From zinc. By sulphuretted hydrogen, which throws down the sulphide of copper from an acid solution.

From silver. By digesting it in the state of filings or powder in a solution of chloride of zinc, which dissolves the first, but leaves the last unchanged.

Copper may be separated, in a state of great purity, from ANTIMONY, ARSENIC, BISMUTH, LEAD, IRON, TIN, ZINC, &c., as it exists in bell-metal, brass, bronze, gun-metal, mosaic gold, and other commercial alloys, by fusing it in a crucible for about half an hour, along with copper scales (black oxide) and ground bottle-glass, or other like flux. The pure metal is found at the bottom of the crucible, whilst the impurities are either volatilised or dissolved in the flux. The proportions for refining commercial copper are, metal, 10 parts; copper scales and bottle-glass, of each, 1 part. The Society of Arts conceived this process to be so valuable, that they presented one of their gold medals to its inventor, Mr. Lewis Thompson.

Uses, &c. The ordinary uses of copper are well known. In *medicine*, 3 or 4 grs. of the filings or powder were formerly given in rheumatism, and to prevent hydrophobia. Some of its salts are still used as astringents, emetics, and caustics. Its alloys are of great value. With zinc it forms BRASS; with tin, BRONZE, BELL-METAL, GUN-METAL, and SPECULUM-METAL. WHITE COPPER is formed by the addition of metallic arsenic, and GERMAN SILVER is a mixture of nickel, zinc, and copper.

Ant. Copper in the metallic state is almost inert, but all its compounds are poisonous. The antidotes are—the white of egg, milk, or flour, mixed with water. The hydrated sulphides of iron, iron filings, and ferrocyanide of potassium have also been strongly recommended, and are exhibited in the same way. Sugar is likewise highly spoken of as an antidote. In all cases a strong emetic should be first given.

Obs. Culinary and pharmaceutical vessels are very commonly made of copper, but too *much caution cannot* be exercised in their *employment.* Acid syrups, vegetable juices, aqueous extracts, soups, stews, &c., prepared in copper saucepans, or boilers, receive a metallic contamination proportional to the length of time they are exposed to the action of the metal. Such vessels are frequently tinned, for the purpose of protecting the copper from contact with their contents, but this film of tin is necessarily very thin, and soon becomes imperfect by constant use. When copper vessels are allowed to remain wet or dirty, or, more especially, greasy, a poisonous green rust forms upon the surface, somewhat similar to verdigris. If articles are prepared in them in this state, serious consequences may ensue. Cases of poisoning from this cause are frequently met with, and instances of vomiting following the use of such articles are almost of daily occurrence, without the reason being suspected. We have occasionally seen confections and extracts, prepared in copper pans, deposit a coating of that metal upon the knives used to stir them. The ashes of the inspissated juices of fresh vegetables, and especially the pulps of fruit, prepared in vessels of this metal, have exhibited the presence of copper on the application of chemical tests. Ketchup is frequently rendered poisonous in this way. The most wholesome material for culinary utensils is thin sheet iron, or tinned iron-plate (TIN), which is very durable if kept clean and dry when not in use. Copper vessels of every kind should be cleaned out, immediately before use, even though they may not appear to require it, and on no account should they be employed for any fluids that are the least acidulous, or that may have to remain long in them.

Copper, Neu′tral Acetate of. $Cu(C_2H_3O_2)_2$. *Syn.* NOR′MAL CU′PRIC ACETATE, ACETATE OF COPPER, CRYS′TALLISED VER′DIGRIS. *Prep.* Dissolve common verdigris or cupric hydrate in hot acetic acid, so as to form a highly concentrated solution; filter, and place in a cool situation to crystallise.

Prop. Beautiful dark, bluish-green prisms, which dissolve in 14 parts of cold and 5 parts of boiling water.

Copper, Ba′sic Acetates of. *Syn.* BA′SIC CU′PRIC ACETATES, SUB-AC′ETATES OF COPPER. Common verdigris is a mixture of several basic acetates which have a green or blue colour. One of these (SESQUIBASIC ACETATE) is obtained by digesting powdered verdigris in tepid water, filtering, and leaving the soluble part to spontaneous evaporation. It may also be obtained in a state of purity by adding liquor of ammonia in small portions to a boiling concentrated solution of the neutral acetate till the precipitate is just redissolved, and leaving the solution to cool. It forms a blue, crystalline mass, but little soluble in cold water. The green, insoluble residue of the verdigris, after treatment with tepid water, contains another acetate (TRIBASIC ACETATE); this may be formed by digesting neutral acetate of copper with the hydrated oxide. A third salt (DIBASIC ACETATE, BLUE VERDIGRIS) is prepared
on a large scale in France by ex
to the air in contact with ferm
lees.

Copper, Ammo″nio-sul′phate o
PHATE OF CUPRAMMONIUM, CU′P
OF AMMO″NIA; CU′PRI AMMO″NIC
CUIVRE AMMONIACAL, Fr.; KUP
Ger. *Prep.* Sulphate of coppe
quicarbonate of ammonium, 1½
ther until carbonic acid ceases
then wrap it in bibulous paper,
the air.

Pur. Pulverulent; dark bl
tense heat it is changed into ox
at first sesquicarbonate of ammo
wards, sulphate of ammonia, bei
It is soluble in water to a splend
solution, from which the salt i
by alcohol in blue crystals. Thi
the peculiar property of dissolvi
(cotton, paper, &c.). The cellu
precipitated from the solution
flakes by the addition of acids.

Uses, &c. It is occasionally
pyrotechny. In *medicine*, it has
chorea, epilepsy, hysteria, &c.,
principally used as an injection,
foul ulcers, and as a collyrium,
the cornea.—*Dose.* ¼ gr., graduall
5 grs., twice a day. Great care
in drying, as it is apt not only
portion of its weight, but to
inferior colour. Both the ingre
be separately reduced to powder
them.

Copper, Ar′senite of. $Cu(AsO_2)$
PIGMENTS (Scheele's Green).

Copper, Car′bonate of. $CuCO_3$.
CARBONATE OF COPPER, DICARBO
CUPRI CARBONAS, L. *Prep.* Add
soda in excess to a solution of sul
per, and warm the mixture till
flocculent precipitate becomes
sumes a green tint. *Used* as a p
GREEN PIGMENTS and VERDITER

Obs. As prepared above, the c
tains 2 equivalents of water.
green mineral, MAL′ACHITE, has
position, but contains only 1 equ
Another carbonate (TRIBASIC
occurs as a natural ore in large
crystals, of the most intense blu
yet been artificially imitated.

Cuprous Chloride. CuCl. *Syn.*
OF COPPER, SUBCHLORIDE OF CO
By exposing the neutral chloride
the action of heat.

Prop. White; fusible; slight
water; and decomposed by exp
air.

Copper, Chloride of. $CuCl_2$.
CHLORIDE OF COPPER. *Prep.*
scales or black oxide of copper
hydrochloric acid, and the soluti
and crystallised.

Prop., &c. Green, acicular

ble in alcohol, the flame of
green. When gently heated,
nd assumes the form of a yel-
powder (ANHYDROUS CUPRIC
LORIDE OF COPPER); at a high
loses half its chlorine, and
ted into cuprous chloride.

Cu_2I. *Syn.* IODIDE OF COP-
E OF COPPER; CU'PRI IODI'DUM,
adding iodide of potassium to a
phate of copper, and washing
l the free iodine from the pre-
A greenish-white precipitate.
) To a solution of sulphate
t, and protosulphate of iron, 3
lution of iodide of potassium,
ry the precipitate. This is the
mmonly known in trade by the
of copper.'

$Cu(NO_3)_2$. *Syn.* NITRATE
'PRI NI'TRAS, L. *Prep.* By
copper in dilute nitric acid to
orating to dryness; redissolving
ter; filtering, evaporating, and
tallise; or from black oxide of
ic acid in the same manner.

&c. Deep-blue prismatic crys-
le in water and deliquescent,
hol. Generally used in medi-
, in injections, or as a caustic,
given internally, dissolved in
iquids.—*Dose.* ⅛ to ¼ gr.

Cu_2O. *Syn.* RED OXIDE OF
'IDE, SUBOXIDE; CUPRI SUB-
Prep. Add grape sugar to a
hate or acetate of copper, then
stic potassa, in excess; the blue
to ebullition deposits the sub-
ust then be collected, washed,

f cane sugar, 27 parts, in water,
oured over hydrated oxide of
d in the compressed and still
parts; a solution of caustic po-
a, in water, 60 parts, is then
e whole mass well agitated
he ordinary temperature, and
h linen. If the dark-blue fil-
ated (continually stirring), over
hydrous cuprous oxide is disen-
liquor becomes nearly colourless.

, *&c.* A superb red powder,
ic lustre. It often occurs in
parent, ruby-red crystals, asso-
er ores of copper, and can be
is state by artificial means. It
igment and a bronze, and as a
and enamels, to which it gives
ur. By heat it is converted into
le. With ammonia it forms a
ion, which rapidly becomes blue
of the air.

CuO. *Syn.* OX'IDE OF COPPER,
PROTOXIDE; CU'PRI PROTOX'Y-
By heating *the nitrate or car-*
r to redness. When it ceases

to lose weight the conversion is completed, and the oxide appears as a heavy, black powder.

By heating in the air the hydrated oxide thrown down from solutions of copper by pure potassa.

By adding caustic potassa, in excess, to a solution of a cupric salt, and heating the whole to a boiling-point; the precipitate is then collected, washed and dried. A heavy, dark-brown powder.

Uses, &c. Protoxide of copper is unchanged by heat, unless combustible matter is present, when it readily parts with its oxygen; hence its general use in ORGANIC ANALYSIS as a source of that element. It communicates a beautiful green colour to glass and enamels. With the acids it produces the ordinary salts of copper.

Cupric Sulphate. $CuSO_4 . 5Aq$. *Syn.* SULPHATE OF COPPER, BLUE COP'PERAS, B. VIT'RIOL; CU'PRI SUL'PHAS, L.; SULFATE DE CUIVRE, Fr.; KUPFER VITRIOL, Ger.; NEELA TOOTIA, Hind. *Prep.* (Commercial.) The sulphate of copper of commerce is obtained by the oxidation of native sulphide of copper (COPPER PYRITES); by the joint action of air, heat, and moisture, the copper is converted into an oxide, and the sulphur into sulphuric acid. The resulting salt is washed out, and the solution evaporated and crystallised. The water found in and issuing from copper mines often furnishes such a solution ready to the hands of the manufacturers. A large quantity of sulphate of copper is also obtained as a secondary product in the refining of silver, and is occasionally prepared by dissolving in sulphuric acid an oxychloride of copper, made for the purpose, by exposing sheets of copper to the joint action of air and hydrochloric acid.

(Pure.) By the direct solution of the metal, or preferably, of its oxide or carbonate, in sulphuric acid, or by purifying the commercial salt by recrystallisation, &c.

Prop., Uses, &c. Fine blue crystals, slightly efflorescent, having an intensely styptic and metallic taste. By heat the blue salt loses its water of crystallisation, and becomes a white, anhydrous powder. It dissolves in 4 parts of water at 60° Fahr., and in 2 parts at 212°; is insoluble in alcohol and ether; and is decomposed at an intense heat into protoxide of copper, sulphurous acid, and oxygen. It has been used to prevent the dry rot in timber, and in dyeing. It is largely employed as a source of metallic copper in the ELECTROTYPE. Grain is steeped in a weak solution of it by the farmer, to prevent the 'smut.' As a medicine, it is employed chiefly as a styptic (in solution) and caustic (in substance) to destroy 'proud flesh;' and, less frequently, as an astringent or tonic (from ¼ gr. to 2 grs.), and an emetic (3 or 4 grs. to 10 or 12 grs.). It is exceedingly *poisonous.*

COP'PERAS. *This is a* generic name for the *CRUDE METALLIC SULPHATES.* When used without a qualifying adjective, it generally means sulphate of iron.

Copperas, Blue. Crude sulphate of copper. See Copper (*above*).

Copperas, Calcined′. From green copperas, heated in an unglazed earthen pot until it becomes white and dry. *Used* as an astringent and 'drier,' and in making ink and dyeing.

Copperas, Green. *Syn.* Copperas. Crude sulphate of iron. See Iron.

Copperas, White. Crude sulphate of zinc. See Zinc.

COP′PERING. Iron may be covered with a thin film of copper by merely immersing it (previously scoured clean) in an acidulated solution of sulphate of copper, after which it must be rinsed in clean water. This film soon rubs off, but still it lasts long enough to deceive the travelling tinker's customers, who imagine that their copper kettles are properly repaired. Metals may be conveniently coated with compact copper to any desired thickness by means of voltaic electricity. See Electrotype.

COP′ROLITE. *Syn.* Dung′stone, Fossil manure. This mineral is the petrified dung of carnivorous reptiles. (Buckland.) Coprolites are found in all the secondary and tertiary strata. They contain a considerable proportion of phosphate of lime, for which reason they are largely employed in the manufacture of artificial manures. They form the bases of Lawes' superphosphate of coprolite manure. The nodules, after being washed, are ground to powder in a mill, and mixed with an equal weight of oil of vitriol.

COPTIS TEETA. (Ind. Ph.) *Syn.* Coptis, or Mishmi tita. *Hab.* Mishmel mountains, east of Assam. *Officinal part.* The dried root (*Coptidis Radix*), imported into Bengal from Assam, in small rattan baskets, each containing from 1 to 2 ounces of the drug. This consists of pieces of a woody rhizome, of the thickness of a small goose-quill and from 1 to 2 inches in length, often contracted at one extremity into a short woody stem; the surface is usually rough, irregular, more or less annulated, and marked with the remains of rootlets in the shape of short spiny points. Externally, yellowish-brown; internally, much brighter, frequently of a golden-yellow colour, exhibiting on fracture a radiated structure. Taste, persistently bitter, and when chewed tinges the saliva yellow. Contains neither tannic nor gallic acid, but abounds with a yellow, bitter principle, soluble in water and alcohol.—*Prop.* Pure bitter tonic.—*Therapeutic uses.* In debility, convalescence after fevers, and other debilitating diseases, atonic dyspepsia, and in mild forms of intermittent fevers.—*Dose.* 10 to 15 grs. of the powdered root, thrice daily.

Tincture of Coptis (*Tinctura Coptidis*). Take of coptis root, in coarse powder, 2½ oz.; proof spirits, 2 pints. Macerate for 7 days in a closed vessel, with occasional agitation; strain, press, filter, and add sufficient p
make 1 pint.—*Dose.* ½ to 2 fl.

Infusion of Coptis (*Infus*
Take of coptis root, in coarse p
boiling water, 1 pint. Infuse
vessel for 2 hours, and strain.—
fl. oz., thrice daily.

COR′AL. *Syn.* Coral′lium,
prehensive term for all calcar
structures secreted by the ma
polypes, or zoophytes. The
commerce, which is so largely
beads, ear-rings, and other orna
described as the internal skeleton
rubrum.

Coral, Red (Facti″tious). *Syn*
ru′brum facti″tium, L. Pr
coloured with a little sesquioxi
rose pink, and passed through
by the druggists for powdered c

Coral, Prepared′ Red. *Syn.*
ru′brum prepara′tum. Levig
formerly used in medicine as
absorbent, and is still occasion
as a dentifrice. It consists alm
carbonate of lime, coloured with
iron, and possesses no advanta
chalk. It is prepared in a simil
chalk.

CORD′IALS. *Syn.* Cardi′aca
stimulating, restorative medicin
to raise the spirits and promot
tion. The principal cordial med
ticed under the heads Tincture
See also Patent Medicines.

Cordials. Aromatised and swe
used as beverages. See Liqueu

CORIAN′DER. *Syn.* (Coria
Coriandri fructus, B. P.);
C. seed; Coriandrum (Ph. L.
"The ripe fruit of the *Coriand*
dried." (B. P.) Coriander is c
confectioners and distillers as a
gredient. In the East it is muc
a condiment, being an ingredie
powder. It is aromatic, carm
stimulant; and more effectuall
taste of senna than any other
Dose. 20 to 60 grs.; chiefly u
rective or adjuvant in compound

CORK. The outer bark of
Suber or *cork oak,* a tree commo
France, Italy and Spain. The
from the younger branches of th
employed for tanning. See Alc

Cork. A stopple or plug for
cut from the above substance.
practice of employing inferior
purpose of stopping the mouths
often productive of considerable
air being only partially exclu
contents suffering in consequen
large bin of valuable wine has
this cause, in less than a year,
than sour 'Cape.' Chemical
often suffer from a similar ca

lled 'velvet corks,' and of
ualities are imported from
should be spared to obtain
rk for connecting the com-
ing-tubes used in organic

ts have been made to in-
ing by machinery, but they
d to supersede hand labour.
A thin brass tube, filed to a
l for piercing holes through
ubes of different sizes, which
er, are generally sold toge-
le and convenient instrument
into the laboratory by Dr.

CLA'VUS, L. A horny indu-
kin, with a central nucleus,
t the base. The common
is continued pressure over
f the bones, from tight or
oes. They are of two kinds,
The first grow on the ex-
f the joints; the last, between

s consists in keeping the feet
ant ablution with warm water,
of easy, soft boots and shoes.
tter precaution, corns will gene-
ven after they appear to have
removed.

After soaking the feet in warm
few minutes, pare the corns as
ble with a sharp knife, taking
ke them bleed. They may now
er with a little lunar caustic, or
a little concentrated acetic acid
vinegar. The last two do not
in. The first is used by merely
n the corns, previously slightly
ith water; the others, by moisten-
with them, by means of a small
d, or, preferably, a rod of glass;
ng taken not to allow the liquid
e neighbouring parts. This treat-
ted every 3 or 4 days for 10 days
t, accompanied by the use of soft,
will generally effect a cure. It
commended to remove large corns
of silk, applied as close to their
sible, and tightened daily until
ff; but this plan is tedious, and
venient, and is not always suc-
nother mode of extirpation is, the
of a small blister, which will fre-
e them with the skin out of their
this case the exposed surface must
with a little simple ointment. Soft
be removed by applying ivy leaf,
soaked in strong vinegar, changing
every morning; or by placing a
soap cerate, spread on a bit of lint
between the toes. One of the
d best remedies for hard corns, and
received the sanction *of high medi-*
is to wear upon the toe or part affected a small, circular piece of soft leather, or, still better, a piece of amadou, spread with diachylon, or some other emollient plaster, and having a hole cut in the centre, corresponding to the size of the corn. (Sir B. Brodie.) By this means the pressure of the boot or shoe is equalised, and the apex of the corn protected from injury. The following are among the most useful of the POPULAR REMEDIES FOR CORNS:—

Corns, Caus'tic for. *Prep.* From tincture of iodine and chloride of antimony, of each, 1 dr.; iodide of iron, 3 grs.; mix. It is applied with a camel-hair brush, after paring the corn. 2 to 4 applications are said to effect a cure.

Obs. Most of the remedies noticed below really act as caustics.

Corns, Lo'tion for. *Prep.* 1. A solution of sal-ammoniac, 1 part; in proof spirit, 4 parts.

2. A concentrated aqueous solution of sulphate of copper. To be applied night and morning.

Corn Plasters. *Prep.* 1. From white diachylon, 3 parts; yellow resin, 2 parts; verdigris, 1 part; melted together, and spread on leather.

2. From galbanum plaster, 1 oz.; verdigris, 1 dr.; as the last.

3. From resin plaster, 2 oz.; black pitch, 1 oz.; verdigris and sal-ammoniac, of each, ½ dr.

4. To the last add powdered opium, 1 dr. Recommended to allay pain, &c.

5. (W. Cooley.) A piece of spread adhesive plaster is placed upon a table, and a piece of card paper having a round hole cut in it the size of the central portion of the corn is laid upon it; the exposed part is then softened by holding a piece of heated iron for a second or two near it; the card paper is then instantly removed, and nitrate of silver, in fine powder, is sprinkled over the part which has been warmed. As soon as the whole is cold, the loose powder is shaken off, and the plaster is ready for use. Very cleanly and convenient. Two or three applications seldom fail to effect a cure.

6. (MECHANICAL CORN PLASTERS.) From common adhesive plaster spread on buckskin, amadou, or vulcanised India rubber, cut into pieces, and a circular hole corresponding to the size of the corn punched in each.

Corn Sol'vent. *Prep.* 1. Carbonate of potassa or pearlash, contained in an open jar or bottle, set in a damp place, until it deliquesces into an oil-like liquid (oil of tartar). Applied by means of a feather, or a small piece of rag dipped in it is bound on the corn.

2. Hydrate of potassa, 1 dr.; rectified spirit, 1 oz.; dissolve. As No. 1.

3. Carbonate of potassa, with smalts, ochre, or bole, q. s. to give it the required colour. It must be kept dry, in a well-corked bottle. A pinch is placed on the corn, and confined by *means of adhesive plaster* or rag.

4. *Carbonate of* soda, 1 oz., finely powdered

and mixed with lard, ½ oz. Applied on linen rag every night.

5. (Sir H. Davy's.) Carbonate of potassa, 2 parts; salt of sorrel, 1 part; each in fine powder; mix, and place a small quantity on the corn for four or five successive nights, binding it on with a rag.

Obs. Care must be taken, in all cases, to pare the corn moderately close before applying the remedy; but in *no case should any of the above be applied to a raw surface.*

Corns, Pommade' for. *Prep.* 1. Powdered verdigris, 1 dr.; savine ointment, 7 drs.

2. Dried carbonate of soda, 3 drs.; lard, 5 drs.; verdigris or smalts, q. s. to give a slight tinge of green or blue. Applied on a piece of rag.

CORRO'SIVE SUBLIMATE. See MERCURY.

CORUN'DUM. See EMERY.

COSMET'ICS. *Syn.* COSMET'ICA, L.; COSMETIQUES, Fr. External applications employed for the purpose of preserving or restoring personal beauty. The term is generally understood to refer to substances applied to the cuticle, to improve the colour and clearness of the complexion; but some writers have included under this head every topical application used with the like intention. Hence cosmetics may be divided into—CUTANEOUS COSMETICS, or those applied to the skin; HAIR COSMETICS, or such as are employed to promote the growth and beauty of the hair; and TEETH COSMETICS, or such as are used to cleanse and beautify the teeth. See BALDNESS, COSMETIQUE, DENTIFRICE, DEPILATORY, HAIR-DYE, POMMADE, TOOTH POWDER, &c.

COSMETIQUE. [Fr.] Hard pomatum, formed into a cake or stick for the toilet. It is sometimes coloured black or brown, the pigments being added in the state of an impalpable powder.

1. (BLACK—COSMETIQUE NOIR.) From good lard, 5 parts; wax, 2 parts; (or, hard pomatum, 7 parts;) melt, stir in levigated ivory black, 2 parts; and pour it into moulds of tinfoil; which are afterwards to be placed in paper sheaths.

2. (BROWN—COSMETIQUE BRUN.) As the last, but using levigated umber for 'plain brown,' and levigated terra di Sienna for 'auburn' and 'chestnut.'

3. (WHITE, OR PLAIN—COSMETIQUE BLANC.) The same, without colouring matter.

Obs. They are generally scented with musk, ambergris, or cassia.

Use. The above are used to colour moustaches, eyebrows, whiskers, &c., as well as to keep the hair in its place. The labels on the packets before us have—"pour fixer et lisser les cheveux." The application must be renewed daily, as the cosmetique is gradually removed by friction, and perfectly so by soap-and-water.

COTAR'NINE. A crystallisable substance obtained from the mother-liquors of opianic acid. It is basic, very solubl
Hydrochlorate of cotarnine is sol
talline.

COT'TON. *Syn.* GOSSYPIUM, I
of which textile fabrics are m
hairs covering the seeds of cert
longing to the natural order *Ma*
Mallow family. Our commerci
pears to be derived from four di
viz.:—

Gossypium arboreum. The
an Indian species. Unlike the
plants, it has the dimensions o
The cotton-hairs are remarka
silky, and are woven by the nati
fine muslin, used for turbans by
classes only.

Gossypium Barbadense. The
or 'Bourbon cotton plant.' This
which yields all our best cotton.
American islands which fringe t
Charlestown to Savannah, this p
duced the celebrated 'sea-island
is unrivalled for the length of it
strength, and silkiness.

Gossypium herbaceum. The co
plant of India. It produces the
of commerce.

Gossypium Peruvianum or acu
species supposed to be indigeno
It furnishes the South America
cotton, as Pernambuco, Peruvian
and Brazilian.

Identif. See LINEN.

Dyeing. The fibres of cotton
the same affinity for mordants an
ing matter of dyed stuffs as lin
be treated in the same manner.
LINEN, &c.

COTTON, GUN-. See PYROXY

COUGH. *Syn.* TUS'SIS, L. Th
violent expulsion of air from the
generally symptomatic of othe
but is sometimes idiopathic, o
disease. Many cases of cough
the extension of catarrh to the
bronchiæ, which thus become
mucus or phlegm, which they
throw off by the convulsive
coughing. In some cases it is
vitiation and inspissation of th
arising from the imperfect actio
sorbents; this is the common c
dry cough of old people. Idiopat
not considered dangerous in its
running its regular course, but it
ductive of most serious consequen
inducing the inflammation of so
laying the foundation of phthisis.

Cough is sometimes attended
expectoration, and at other times
out any; it has hence been distin
moist or mucous cough, and dry c

Treatment. That of common cat
consists in allaying the irritatio
possible, by demulcents and ex

inks and lozenges, which act
s, and sympathetically upon
l bronchiæ. Among the first
d, almond milk, barley water,
uice, gum arabic, and a mixture
nade into lozenges; among the
t innocent and convenient is
the shape of lozenges, 2 or 3
sucked whenever the cough is
light diet should be adopted,
slightly relaxed by the use of
and a mild and equable tem-
as much as possible. When
ot succeed, recourse may be
c, followed by small doses of
, and extract or tincture of
ill pill. When a cough is
night, and unattended with
se of laudanum, or tincture of
n going to rest, will generally
In the treatment of dry cough,
ating expectorants are useful,
niacum, styrax, and benzoin,
narcotics and sedatives, as
k, and opium. A diaphoretic
very useful, especially in the
ple. See DRAUGHT, EMULSION,
, &c.

kōō-). *Syn.* CU'MARIN. The
le of the fruit or bean of
a (tonquin bean). It exists in
lants, as *Melilotus officinalis,*
ta, and *Anthoxanthum odo-*

the sliced tonquin beans, by
ot alcohol; straining through
ling off the greater part of the
upy residue deposits, on stand-
f COUMARIN, which must be
fat oil by pressure, and then
n hot water.

r, brilliant, colourless needles;
Fahr., and distilling at a higher
thout decomposition. It has a
and burning taste; it is very
in cold water, more freely in
also in alcohol.

RITANTS. In medicine and
stances applied to the surface
establish a secondary morbid
e view of relieving one already
ainful and spasmodic affections,
pasms, and cramp; in rheuma-
swelled and painful joints; in
throat, sprains, languid glandu-
d many other cases, this class
ten proves extremely valuable.
ritants which are best known
stard poultices, hartshorn-and-
t of ammonia.

TER. See PLASTER.

This substance was formerly
rge quantities by the calico
tly, a mixture of sulphate,
hosphate of lime and soda, with
, has been successfully tested as a substitute for it, and has the advantage of cleanliness and economy.

COW'HAGE. *Syn.* COW'ITCH; MUCU'NA (Ph. L. E. & D.), L. "The hairs of the fruit *Mucuna pruriens*" (Ph. L.). "The hairs from the pods" (Ph. E.). "The hairy down" (Ph. D.). It occasions violent itching when it comes in contact with the skin, which can only be allayed by a solution of green vitriol, or by oil. It is frequently administered as a vermifuge, made into a confection, by scraping the hair off a pod into treacle, syrup, or honey, for a morning dose, which is repeated for 3 or 4 successive days, followed by a brisk purge. It acts more effectually if its administration has been preceded by a gentle emetic.

COWS. See DAIRY.

CRAB. See SHELL-FISH.

CRACK'NELS. Small, brittle cakes or biscuits, made by first boiling and then baking paste. *Prep.* To flour, 1 pint, add a little grated nutmeg, the yolks of 2 eggs, 2 or 3 spoonfuls of rose-water, and cold water, q. s. to make a paste; then roll in butter, ½ lb., and make it into shapes. In one hour put them into a kettle of boiling water, and boil them until they swim, then throw them into cold water; take them out, and when dry, bake them on tins. Those of the shops contain less butter, and the rose-water is omitted.

CRACK'NUTS. Thin and sweet cakes or wafers. *Prep.* 1. Flour, 1 lb.; sugar, ¾ lb.; melted butter, ½ lb.; 6 or 7 eggs, well beaten; make a paste with a glassful of raisin wine and a little water; add caraways, roll it out as thin as paper, cut it into shapes with a tumbler, wash the pieces with the white of egg, and dust them over with powdered sugar.

2. As the last, but using ½ lb. more flour.

CRAMP. See SPASMS.

CRAPE is cleaned by rinsing it in ox-gall and water, to remove the dirt; afterwards in pure water, to remove the gall; and lastly, in a little gum-water, to stiffen and crisp it. It is then clapped between the hands until dry.

CRAY-FISH. See SHELL-FISH.

CRAY'ONS. Colouring substances made up into small cylinders or any other convenient form for use in writing or drawing.

Crayons, Draw'ing. *Prep.* 1. Spermaceti, 3 oz.; boiling water, 1 pint; agitate together till they form a species of emulsion; add bone ash, 1 lb. (or more, previously reduced to an impalpable powder), and colouring matter, q. s. to give the proper tint; reduce the whole to a perfectly homogeneous paste, and form it into crayons.

2. Pipeclay and the finest prepared chalk, equal parts; or pipeclay alone, q. s.; colouring, a sufficient quantity; make them into a paste with pale mild ale.

3. White curd or Castile soap, cut into thin shavings, 1 oz.; boiling water 1 pint; dissolve, *and when cold, add* gradually, as much recti*fied spirit of* wine as will render the liquid

barely transparent. With this fluid make equal parts of the finest elutriated clay and chalk into a stiff paste, adding colouring matter, q. s., as before. For common qualities, the spirit of wine may be omitted, but the mass will then dry more slowly.

4. Curd soap, 1½ oz.; gum arabic, ½ oz.; boiling water, 1½ pint; dissolve, and use it as the last. General Lomet uses a similar mixture to work up the softest varieties of hematite, with which he thus forms superior red crayon.

5. (Process of the Brothers Joel, of Paris.) Shell-lac, 3 parts; spirit of wine, 4 parts; oil of turpentine, 2 parts; dissolve; add pure clay, 6 parts; colouring matter, q. s.; form the mass into crayons, and dry them by a stove heat.

6. Pale shell-lac, 5 parts; wood naphtha, 12 parts; dissolve, and with this fluid mix up the colouring powder, previously stirred up with an equal weight of fine pale-blue clay; dry by a stove heat, as before. When this process is well managed, it produces crayons equal to those of the best Parisian houses.

Obs. The composition may be formed into crayons by simply rolling it on a slab; but to ensure their solidity the manufacturers generally employ a metallic cylinder of 2 or 3 inches in diameter, with one end open and the other firmly secured to a perforated plate, having holes of the same size as the intended crayons. The crayon composition, in the state of a stiff paste or dough, is introduced into the open end, and is forced down and through the holes, by means of a small plug or piston, that exactly fits the inside of the cylinder, and which is driven by the equable motion of a small screw. The pieces that pass through the holes are then cut into lengths and dried.

The substances employed as colouring matters for crayons are very numerous, and their choice offers a wide field for the skill and fancy of the artist. The pigment having been selected, it may be reduced to any shade or tint by admixture with other pigments, and by 'dilution' with a proper quantity of elutriated or prepared chalk. As, however, crayon colours do not admit of being mixed together at the time of using them, like liquid colours, it is usual to make 3 to 6 different shades of each colour, so as to enable the artist at once to produce any effect he chooses.

Crayons, Black. From prepared black-lead, ivory-black, lamp-black, &c. Black chalk and charcoal are frequently made into crayons by simply sawing them into suitably sized pieces. They may then be put into a pipkin of melted wax, and allowed to macerate for an hour; after which they should be taken out, drained, and laid on a piece of blotting-paper to dry. Drawings made with these crayons are very permanent, and if warmed slightly on the wrong side, the lines will adhere, and become almost as durable as ink.

Crayons, Blue. From indigo, smalts, Prussian blue, verditer, &c.

Crayons, Brown. From umber
burnt), terra di Sienna (raw and
len's earth, brown ochre, &c.; and
liar shades, from a mixture of black
and either of the above colours.

Crayons, Green. From a mixture
yellow, or yellow ochre, with blues.

Crayons, Purple. From any of
brilliant blues, mixed with carmine
vermilion.

Crayons, Red. From carmine,
lakes, vermilion, hematite, and
earthy or mineral colours commonly
pigments. Crayons of red chalk
pared in the manner pointed out
of black chalk.

Crayons, White. From pure
chalk.

Crayons, Yellow. From king'
Naples yellow, orpiment, yellow ochr

Crayons, Lithograph'ic. *Prep.* 1.
soap, 7 parts; white wax, 6 parts;
gentle heat, and add lamp-black, 1 p
it melted, with constant stirring, for
minutes, then let it cool a little, a
into moulds.

2. White wax, 4 parts; shell-lac
tallow soap, of each, 2 parts; lamp
part; as last.

3. Spermaceti, white wax, and har
soap, of each, equal parts; lamp-black
colour.

Obs. Some makers melt the soap,
lamp-black, in an iron-ladle, over a
and allow the mixture to blaze f
seconds before adding the shell-lac,
no sooner thoroughly incorporated
heat is increased until the mass agai
when it is at once removed from the
stirred until it is cool enough to b
into the moulds. This method leads
and loss, without any corresponding
These crayons are used to draw d
lithographic stones.

Crayons for Writing on Glass.
From French chalk cut into suitab
Marks made with these crayons,
scured or rubbed out, may be seve
revived by simply breathing on the g

2. (Brunquelle.) Spermaceti, 4 par
3 parts, wax, 2 parts, are melted to
a cup; and red lead, 6 parts, and car
potassa (in fine powder), 1 part,
the mass is kept melted and stirred
half an hour longer, then poured i
moulds (tubes) of the thickness of a
pencil, and cooled as rapidly as possi
mass may be screwed up and dow
tube, and cut to a point with a
crayon is thus obtained which wil
write upon clean, dry glass.

CREAM. *Syn.* Crem'or, C. lac
lac'tis, L. The oleaginous portion
which collects in a thin stratum upo
face, when that fluid is left undist
some time. By violent agitation,

ing, the fatty globules unite
ig butter; whilst the liquid
ng of caseum, serum, and a
nstituting the residuum, is
k. This separation is effected
when the cream has become
d coagulated by being kept a
inge which occurs in conse-
nversion of some of the sugar
ito lactic acid, which precipi-
us matter contained in the
f the milk with which the

On these simple facts chiefly
essful manufacture of butter.
ded for churning should there-
itil it turns slightly sour, and
ndition above referred to, as
er will readily 'come.' If
uite sweet, the operation will
l will frequently fail. When
e dairy maids declare the milk
: 'bewitched,' and reluctantly
e operation. The addition of
r vinegar, is the proper remedy
d will cause the almost imme-
i of the butter.

is suspended in a linen bag, and
in, it gradually becomes drier
y the separation of the liquid
en forms what is known by the
m cheese. By the application
ure, the separation of the whey
etely effected, and the product is
r, but will keep longer.

am, in a dietetic point of view,
ded in the same light as butter,
rted into butter in the process of
this account much cream should
n at once by persons of delicate
n eating cream with fruit, per-
dly aware of the large quantity
e, until they find it disagree with
, when the condiment is blamed
ration of those who take it. See
ER, &c.

mond. *Prep.* From sweet almonds,
r almonds, 4 in no.; blanched and
mortar to a smooth paste, adding a
of water to prevent oiling; and,
a pint of cream, and enough pow-
sugar to sweeten; the whole is
to a froth, the glasses filled with
and some of the froth placed on
ach. Some persons add the juice

an'dy. *Prep.* To the last, add the
ggs; heat it gently over the fire
ickens, keeping it well stirred,
r add 2 or 3 glassfuls of brandy,
it into small cups or shallow

mt. *Prep.* Cream, 1 quart; cassia,
; peel of half a lemon; boil for 5
l a little, take out the spice, and
ks of 9 eggs, and sugar, *q. s. to*
ir until cold, put it into a dish, strew pounded sugar over it, and bake it until brown.

Cream, Choc'olate. *Prep.* Chocolate, scraped fine, 1 oz.; thick cream, 1 quart; sugar (best), 6 oz.; heat it nearly to boiling, then remove it from the fire, and mix it well; when cold, add the whites of 8 or 10 eggs; whisk rapidly, and take up the froth on a sieve; serve the cream in glasses, and pile up the froth on the top of them.

Cream, Cof'fee. *Prep.* 1. As the last, omitting the chocolate, and using a pint of the strongest made coffee.

2. Add a teacupful of very clear, concentrated, made coffee to 1 pint each of clarified calf's feet jelly and good cream; sweeten with lump sugar, give it one boil up, and pour it into shapes or glasses when nearly cold.

Cream, Cold. See COSMETIC CERATE and GRANULATED CREAM (*below*).

Cream, Costorph'in. After a village near Edinburgh, where it is commonly made. *Prep.* The milk of 3 or 4 consecutive days, together with the cream, are allowed to remain until sour and coagulated; the whey is then drawn off, and fresh cream added. It is eaten with sugar and fruit, especially with strawberries and raspberries.

Cream, Dev'onshire. *Prep.* 1. (DEVONSHIRE RAW CREAM.) From sour cream mixed with an equal quantity of fresh cream, and sweetened with sugar. Eaten with fruit.

2. (DEVONSHIRE SCALDED CREAM, D. CLOUTED C.) The milk of yesterday is set in a polished, shallow, brass pan, over a clear fire free from smoke, and gradually heated until very hot, care being taken not to let it boil; when the undulations on the surface look thick, and form a ring round the top of the fluid, the size of the bottom of the pan, it is removed from the fire and allowed to cool; the next day it is skimmed off for sale. *Used* with either tea or coffee, and excellent with both; it is also eaten with sugar and fruit, and is made into butter. See CREAM (*above*).

Cream, D'Illotte's. *Syn.* CRYSTALLISED CREAM, VEGETABLE C. The ingenious manufacturer whose anagrammatic powers have converted his patronym of Elliott into one less familiar to vulgar English ears, prepares this really elegant hair cosmetic as follows:—Oil of almonds, 3 oz., and spermaceti, ½ oz., are melted together; and bergamot, neroli, and verbena, of each, 5 drops, and huile au jasmin, 10 drops, are then stirred in, and the mixture is at once poured into small, wide-mouthed bottles, to crystallise. If preferred harder, ½ dr. more spermaceti may be used, but the precise quantity to produce the best crystalline appearance depends greatly on the season of the year, more being required in winter than in summer.

Cream, Facti''tious. *Syn.* MOCK CREAM. *Prep.* 1. Beat 3 eggs, with 2 oz. of sugar, *and a small piece of butter,* until the combi*nation is complete;* then add, warm milk, 1 pint; put the vessel into another containing hot water, and stir it one way until it acquires the consistence of cream.

2. Arrow-root, 1 spoonful; wet it with a little cold milk, then add, gradually, boiling milk, ¼ pint; mix well, and further add, of fresh butter, 1 oz.; sugar, 1¼ oz.; cold milk, ¾ pint; and continue stirring until the whole is quite cold.

Cream, Ice. See ICE.

Cream, Fruit. *Prep.* From pulped or preserved fruit, 1 lb.; cream, or good raw milk, 1 quart; sugar, q. s.; boil for 1 minute; cool, and add a glassful of brandy. A froth is raised on these creams with a chocolate mill. It is taken off, and placed on a hair sieve, and some of it, after the glasses are filled with the cream, placed on the top of each. The expressed juice of raspberries, of currants, and several other kinds of fruit, also make delicious creams. In winter, raspberry jelly, jam, or syrup, may be used. A glass of good brandy improves these creams.

Cream, Fur'niture. See POLISH.

Cream, Gran'ulated. *Syn.* GRANULATED COLD CREAM. *Prep.* (Owen.) Almond oil, 6 oz., white wax and spermaceti, of each, 2 oz., are melted together, and a little otto of roses added; the liquor is then poured into a large Wedgwood-ware or marble mortar, previously warmed, and containing 1½ to 2 pints of warm water; brisk agitation with the pestle is then had recourse to, until the oleaginous portion is well divided, when the whole is suddenly thrown into a vessel containing a gallon or two of clean cold water; lastly, the granulated cream is thrown on a muslin filter; and as much water as possible is shaken (gently) out of it; after which it is put up for use.

Cream, Lem'on. *Prep.* From cream, 1 pint; yolks of 3 eggs; powdered sugar, 6 oz.; the yellow rind of 1 lemon (grated), with the juice; mix, apply a gentle heat, and stir until cold. If desired white, the whites of the eggs should be used instead of the yolks.

Cream, Or'ange. Similar to lemon cream, but using oranges.

Cream, Pista''chio. From the kernels of pistachio nuts, as almond cream.

Cream, Rasp'berry. See FRUIT CREAM.

Cream, Sat'urnine. *Syn.* CREM'OR PLUM'BI ACETA'TIS, L. *Prep.* (Dr. Kirkland.) Cream, 1 oz.; solution of diacetate of lead, 1 dr.; mix. Cooling, sedative, and astringent; a useful application in certain cases to irritable ulcers, sore nipples, &c. It is poisonous.

Cream, Scotch Sour. *Prep.* (Gray.) Skimmed milk is put over night into a wooden tub, with a spigot at the bottom, and this tub is put into another filled with hot water; in the morning the small tub is taken out and the thin part of the milk ('wigg') drawn off until the thick, sour cream begins to come. This process requires practice as to the heat of the water; when it succeeds, skimmed milk yields *nearly one half* of this cream, which is eaten with sugar as a delicacy; it is u
guishable from cream by its tast
for double the price of fresh milk.

Cream, Stone. *Syn.* CREAM
Prep. From isinglass, ½ oz.,
boiling water, a teacupful, addin
pint, and sugar, 4 oz.; stirred
cold, and then poured over fruit
placed on the bottom of glass dish

Cream, Tarax'acum. *Syn.* CREM'
ACI, L. *Prep.* (Dr. Collier.) Fr
dandelion roots (sliced), sprinkled
of juniper, and then pressed for
—*Dose.* A table-spoonful twice or
as a stomachic and tonic, in dyspep

Cream, Vanil'la. *Prep.* 1. Boi
vanilla (grated), and isinglass, ½ o
1 pint, until the latter is dissolv
add sugar, 6 oz., and cream, 1 pi
nearly cold, then pour it into
blancmange.

2. Cream and strong isinglass jel
1 pint; sugar, 6 oz.; essence of va
mix as before.

Cream, Vel'vet. *Prep.* As the
stead of vanilla, flavour with the
juice of a lemon, and about a teacup
wine.

Cream, Whipped'. *Prep.* From
of 12 eggs; cream, 1 quart; pale
pint; essence of musk and ambergr
10 drops; essences of lemon and ora
each, 3 or 4 drops; whisk to a fro
the latter on to a sieve, fill the g
the cream, and then pile the froth
of them.

CRE'ASOTE. See KREASOTE.

CRE'ATINE. See KREATINE.

CREAT'ININE. See KREATININ

CRÊME. [Fr.] *Syn.* CREAM.
is applied to several compound
cordial liquors, especially by th
liqueuristes, who pride themselves
perior quality and cream-like smo
their manufactures. Like the cor
English, they are mostly dilute spi
tised, and sweetened. See LIQUEU

CREN'IC ACID. A brown sub
covered by Berzelius in certain min
It is a modification of HUMUS, and i
by the decay of vegetable matter.

CRICK'ETS. These insects m
stroyed by putting Scotch snuff
holes, or by placing some piece
wafers for them to eat.

CRINUM ASIATICUM. (Ind.
bitat. Low humid localities in E
Concans, and other parts of India
tivated in gardens; Ceylon, the Mo
Cochin China.—*Officinal part.*
root (*Crini Radix*); bulbous, with
stoloniferous fusiform portion issui
crown of the bulb; emits an unpl
cotic odour; readily dried in a
reducible to powder after desicca
perties. Emetic; in small doses

rustic uses. Analogous to

(*Succus Crini; Infusum*
Take of the fresh root of
; cold water, 2 ounces.
stone mortar, gradually
Strain, with pressure,
ase. From 2 to 4 fluid
nty minutes, until the
ıced.
(*Syrupus Crini*). Take
crinum, sliced, 8 ounces;
; refined sugar, 1 pound.
the water for two hours,
press through calico, add
ve with the aid of gentle
2 fluid drachms, repeated
ıs a nauseant and emetic

Syn. Oleum croto'nis
(Ph. L. & D.), L. The
m the seeds of *Croton*
ıg croton. This oil is
and a powerful local irri-
ıt. Rubbed on the skin,
ır eruption, and frequently
y (diluted with thrice its
it is occasionally used as a
lose (as a purge). 1 to 2
constipation, lead colic,

rnan'che laryn"gea, C.
trachea'lis, L. An in-
affecting the larynx and

nently laborious and suf-
accompanied by wheezing,
hrillness of the voice, and
ration of purulent matter,
ıreatens suffocation. There
acute croup and chronic
s very rare.
by leeches or cupping,
' the trachea, should be
course to, when the symp-
r violent local irritants, as
d in strong acetic acid, or
pplied to the same part.
of irritable constitution,
avoided. Dr. Larroque
ed vomiting, in the croup
I. Marotte and M. Boudet
plan with great success.
ists in making the patient
p vomit a great number of
day, so as to detach the
from the larynx nearly as
d. For this purpose, M.
e or other of the following

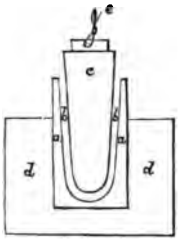
1½ gr.; syrup of ipecacu-
2 oz.
ıe, 8 grs.; syrup of ipeca-
of each, 1½ oz.
re administered by *spoon-*
ıes, until there has been a sufficient number of vomitings. In this manner he says he has been always able to make the patient expectorate a certain quantity of false membrane. This treatment is accompanied by the use of small doses of calomel, leeches to the throat, and blisters to the nape of the neck; but it is the opinion of M. Marotte that the vomitings alone effect the cure. Out of 25 cases that occurred at the Hôpital des Enfans, the only authenticated case of cure among all these was effected by emetics. (M. Boudet.)

The croup is a very dangerous disease, and medical aid should be immediately sought wherever it can be procured. It is principally confined to infancy, or to children under 9 years of age; but occasionally attacks adults. One of our early friends, a young medical practitioner of great promise, died of it, prematurely, after only about 20 hours' illness.

CRU'CIBLE. *Syn.* Melting pot; Crucibulum, L.; Creuset, Fr. A vessel used by metallurgists and chemists for holding substances whilst they are exposed to a high temperature. The crucibles commonly used for fusing metals are formed of clay, or a mixture of plumbago and clay. For certain purposes, crucibles of platinum, gold, silver, iron, porcelain, and lime, are employed.

Crucibles, Earth'en. *Syn.* Clay crucibles. From fire-clay, mixed with silica, coke, burnt clay, or other infusible matter.

Manuf. The materials, having been ground and kneaded, are generally moulded by hand upon a wooden block of the shape of the cavity of the crucible. Another method of shaping a crucible consists in ramming the ingredients into a suitable mould, formed of steel or gun-metal. (See *engr.*)



a a, External steel mould.

b b, Clay or composition for forming the crucible.

c, Internal steel mould.

d d, Wooden stand.

e, Cord or chain to withdraw the internal mould or plug.

Small crucibles are sometimes formed by pouring 'slip,' that is, clay mixed with sufficient water to give it the consistence of cream, into porous moulds, made of a species of stucco. A series of these moulds are placed upon a table and filled with the semifluid composition. By the time the whole (say 50 or 60) are filled, the 'slip' may be poured out of the one first filled, leaving only a very small quantity behind to give the requisite thickness to the bottom. The second and third *may then be treated* in the same way, until *the whole number have* been attended to. In each mould a perfect crucible is formed, by the abstraction of the water of that portion of the 'slip' in immediate contact with the stucco, and the crucible is either thicker or thinner in proportion to the time this absorbent action has been allowed to go on. 70 or 80 crucibles may thus be easily made in less than 15 minutes. The moulds and their contents are next placed in a stove or slow oven. In a short time, from the contraction of the clay in drying, the crucibles may be removed, and the moulds, as soon as they have become dry, may be again filled; by care they will last for years.

Earthen crucibles are used both in the burnt and unburnt state. Small crucibles are generally kiln-burnt before they are used, but the large Stourbridge clay 'casting-pots,' which are extensively employed in brass foundries, are never previously burnt.

The following kinds of earthen crucibles are much used in the arts:—

Crucibles, Cornish. From Teignmouth clay, 1 part; Poole clay, 1 part; sand from St. Agnes's Beacon, Cornwall, 2 parts. When smaller and less refractory crucibles are needed, the same mixture is employed, with the addition of an eighth part of China clay, or Kaolinite from St. Austell. These crucibles are generally made round, and of two sizes, of which one fits into the other; the larger being 3 inches in diameter at the top, and 3½ inches high outside measure. They are coarse in grain, and of a grayish-white colour, spotted with dark specks. They are always kiln-burnt. Of all crucibles, none are more generally useful for metallurgical experiments.

Crucibles, Hessian. From a mixture of equal weights of Almerode clay and sand. They are generally triangular in shape, so that the melted metal may be conveniently poured out from each corner. They are usually sold in 'nests' of six crucibles, fitting one in another. In the character of their body, and in composition and qualities, they closely resemble the Cornish.

Crucibles, London. From a very refractory clay. They have a reddish-brown colour, and are close in grain. They are exceedingly useful in assaying, as they resist the action of fused oxide of lead much better than most clay crucibles. Being very liable to crack, they require to be used with care.

WHITE FLUXING-POTS. From a peculiar kind of foreign clay. They are manufactured by the Patent Plumbago Crucible Company, and are much esteemed by metallurgists, being well moulded and very refractory. They have a smooth surface, and withstand the action of fluxes satisfactorily.

Crucibles, Stourbridge-clay. From Stourbridge clay, 4 parts; burnt clay, obtained by pounding and grinding old glass pots, 2 parts; pipeclay and coke-powder, of each, *1 part.*

Anstey's Patent. From Sto
2 parts; hard gas-coke (previ
and sifted through a sieve of
1 part.

Obs. These crucibles of Sto
are made large enough to hold
or more of melted brass. They
and not baked. For use, they
placed on the furnace, bottom
burning coke gradually heaped
and the firing continued until
full red heat. They are then
out of the furnace, and put in
mouth upwards. If placed in th
the mouth upwards at first, th
crack. After they have been c
allowed to become cold, they are

Crucibles, Plat'inum. These
sable instruments in the labo
analytical chemist. They are ch
in the ignition of precipitates
fusion of silicates with carbonat
render them soluble, a prelim
their analysis. The most ordina
platinum crucible is that of a c
bottom. They are always provi
which are sometimes so constru
may be used, when separated fr
bles, as capsules for ignitions and
Platinum crucibles are not act
bonated alkalies at a high tem
they are liable to be seriously da
caustic alkalies. Precipitates of
ducible metals must never be ig
crucibles, as the reduction of the
infallibly destroy the vessels.

Crucibles, Gold, are exceeding
many operations, on account of t
they stand caustic and carbonate
nitric acid, which destroy plati
crucibles respectively. Their d
their great expense and ready fu

Crucibles, Silver. These ar
for fusions of alkalies, being mu
on than platinum crucibles, and
analyses, from their cheapne
weight. They are easily destro
by acids.

Crucibles, Plumba'go. *Syn.*
BLACKLEAD C., BLUE POTS. F
ground and sifted, mixed with
fractory clay to render it plast
shaped by hand on an ordinary
or by moulds of metal like that
under the head of EARTHEN CR

Prop., &c. Good blacklead c
when of the largest size, suppor
and most sudden alternations c
without cracking, and may be
peated heating and cooling.
within as well as without, may
smooth, so that particles of me
not hang about the sides.
almost universally used for me
cious metals.

Crucibles, Por'celain. These

de in Germany and France of
ises. They are formed of the
y white, thin, and hard por-
es not crack when heated, and
little acted on by the most
al reagents. For some opera-
rsede platinum crucibles, par-
e ignition of the precipitates
fucible metals. They do not
g matter, and are not porous.
e excellently adapted for deli-
testing, the whiteness of the
ng the changes of colour in a
iquid most distinctly.

a. Used chiefly for preparing
ts, as sulphide of iron, calcic
and also for preparing pure
from the nitrate.

A sort of muffin or tea-cake,
spongy. *Prep.* From flour, 2
a dough with warm milk-and-
little salt, 3 eggs (well beaten),
uls of yeast, mixed to the con-
k batter; after standing before
short time, to rise, it is poured
ins, and baked slowly to a fine
he table, crumpets are toasted
sides, buttered, piled on a hot
nto halves.

e paste with which pies, tarts,
or covered.

From flour, 1 lb.; sugar ¼ lb.;
, ½ lb.; 3 eggs; milk, q. s.
baking.

CRUST, FOR MEAT PIES, &c.)
but using 6 oz. of lard for the
instead of 3 eggs.

From flour, 1 lb.; butter and
h, 2 oz.; eggs, 2 in no.; made
ste.

quality is improved if the whole
of the butter is employed in the
under PUFF PASTE. For further
ereon, consult the cookery books
ton, Rundell, and Soyer.

US. See REFRIGERATION.

. A solid body, having a regular
form. The plane surfaces by
al is bounded are termed faces;
t in straight lines or edges; and
eet in points, and form angles.
a crystal is an imaginary line
gh its centre, and terminating
middle of two faces or of two
wo angles; and axes terminating
ts of a crystal are named similar
n the axes of a crystal are pro-
and placed in a right position,
ces are observed to group them-
regular and beautiful manner
axes, and to be all so related to
mpose a connected series, pro-
ng to definite laws. The multi-
of crystals have been distri-
and chemists *into six*
distinguishable from one another by the relative positions and lengths of the three axes about which the planes or faces are arranged; while the different figures of any particular system are distinguishable by the arrangement of the planes in respect to the axes. Thus, the cube or hexahedron, the rhombic dodecahedron, and the octahedron, all belong to the regular system, which is characterised by 3 equal axes cutting one another at right angles. But in the cube each plane cuts 1 axis, and is parallel to 2 axes; in the dodecahedron each plane cuts 2 axes, and is parallel to a third; while in the octahedron each plane cuts the 3 axes. The names and definitions of the six crystalline systems are given below:—

1. REGULAR SYSTEM.	The 3 axes equal and rectangular.
2. SQUARE PRISMATIC S. 2 equal axes.	The 3 axes unequal and rectangular.
3. RIGHT PRISMATIC S. All unequal.	
4. RHOMBOHEDRAL S.	The 3 axes equal, but not rectangular.
5. OBLIQUE PRISMATIC S. 1 axis rectangular to 2.	The 3 axes not equal, and not rectangular.
6. DOUBLY O. P. S. None rectangular.	

CRYSTALLISATION. The act or process by which crystals are formed. The frequent reference to this subject in the pages of this work, and the constant employment of the process of crystallisation in the manufacture of salts, &c., in the laboratory, seem to point out the necessity of a few explanatory remarks thereon under this head. When fluid substances are suffered to pass with adequate slowness to the solid state, or when solutions of solids are slowly concentrated by evaporation, or the solvent powers of the menstruum, gradually lessened by cooling, the ultimate particles of matter frequently so arrange themselves as to form regular geometrical bodies, familiarly known by the name of crystals. This wonderful property, which is possessed by a great variety of substances in the mineral kingdom, and by nearly all saline bodies, is resorted to for many useful and important purposes in the chemical arts. It is by means of crystallisation that the majority of salts are obtained in a state of purity; for in the act of passing into the crystalline state, the foreign substances with which they are united are left behind in the mother-liquor.

Salts are crystallised, either by allowing their hot and saturated solutions to cool slowly, or by simply evaporating the menstrua as long as crystals form. In the first case, the liquid is commonly evaporated until a pellicle appears on the surface, when the vessel is set aside in some sheltered situation until cold, at which *time the crystals* are collected, and the process *repeated for fresh* crystals. In the second case, the crystals are usually removed from the liquid as soon as they are deposited. The first method is adopted for those salts that are considerably more soluble in hot than in cold water, as carbonate of soda, Epsom salts, &c.; the last method, for those that possess nearly equal solubility in both cases, and also for many salts which are not required in handsome crystals; thus common salt and chromate of potash are crystallised in this way. Many of the alkaloids, and their salts, are obtained in crystals, by allowing their solutions (generally alcoholic or ethereal) to evaporate spontaneously. By repeating the processes of solution and crystallisation two or three times with the same body, the crystals obtained by the last operation will usually be found to be quite pure.

Many solids may be readily obtained in a crystalline state by melting them, and allowing them to cool very slowly. Thus, iodide of sulphur is crystallised by melting it in a flask placed in a salt-water bath, and allowing it to remain in the water until the whole becomes cold. Sulphur and many metals are crystallised by pouring them, in a state of fusion, into a hot vessel, having a plug in the bottom, which is withdrawn as soon as the surface becomes cool, when the liquid portion runs out, and leaves the under surface in the form of a mass of agglomerated crystals. Perfectly pure wax, stearine, and spermaceti, have a very pleasing appearance when treated in this way.

CRYS'TALLOID. See Dialysis.

CU'BEBIN. A peculiar substance obtained from cubebs.

Prep. From cubebs (from which the oil has been expelled by distillation), by digestion in alcohol, evaporating the resulting tincture to one fourth, filtering, and then evaporating the remaining fluid almost to dryness. The residuum is left in a cold place until it assumes a semi-crystalline appearance, when it is thrown on a filter, and the fluid portion (the 'cubebine' of M. Cassola) allowed to drain off. In 24 hours, the substance left on the filter is dissolved in 4 times its weight of boiling alcohol (sp. gr. ·90), the solution allowed to deposit its undissolved resin (still maintaining it near the boiling temperature), after which the clear portion is decanted. The crystals deposited as the liquid cools are cubebin. It is purified by redissolving it in boiling concentrated alcohol, and the addition of a little boiling water and animal charcoal, when long, white needles will be deposited, if the solution is allowed to cool very slowly.

Prop., &c. It is insoluble in water, and nearly so in cold alcohol, but very soluble in boiling alcohol. It strikes a fine crimson colour with sulphuric acid, which remains unaltered for some hours; a property which distinguishes it from piperin. Its physiological action has been but little studied. According to Dr. Görres, this for the most part resembles that of cubebs.

CU'BEBS. *Syn.* Cubeb pep
(B. P. & U. S.), Cubebæ
The immature and stalked f
cubeba or *Cubeba officinalis.*
stimulant, stomachic, and arom
other peppers; they are also
appear to possess a specific i
the urino-genital organs.—*Dose*
in affections of the bladder and
and in gleet and leucorrhœa;
the early and inflammatory sta
rhœa, in piles, &c. They may
water, milk, or bitter ale.

CU'CUMBER. The fruit of
sativus (Linn.). *Used* as a s
It is somewhat indigestible, but
dressed, with plenty of oil, it
without the slightest fear of evil
The practice of pouring off the
extracted from the cucumber
not be too strongly condemned.
rium.

CUD'BEAR. *Syn.* Persio. A
tained from *Lecanora tartar*
lichens, by a process nearly si
used in making archil. The lic
with stale urine or other ammo
and suffered to ferment for 3 or
which the whole is poured into
and exposed to the air until the
has disappeared, and it has ass
colour. It is then ground to pow
is confined to a few cases of silk
it is employed to yield shades
maroon; upon wool it gives dee
The colours produced by it are
Like archil, there are two vari
dye-stuff—blue cudbear and
See Archil.

CULM. In *mineralogy*, a slaty
thracite, occurring in Wales
Devon. The term is also appli
pure, shaly kind of coal.

CU'MARIN. See Coumarin.

CU'MIN. *Syn.* Cymini semin
L. The fruit (seed) of *Cumin*
It is carminative and aromatic, l
way and anise. See Plaster.

CU'MINOL. A colourless, tran
powerful odour. It exists with
of cumin. See Cumic Acid and

CU'MOL. See Cumic Acid.

CU'PELLATION. The process
gold and silver and their alloys
the cupel. See Assaying.

CUP'PING. This method of to
is performed as follows:—

The skin being softened by
sponge and warm water, and the
extraneous substances being pr
moved, one of the small bell-like
ping-glasses; cucurbitu'læ),
air contained in it rarified by
over the flame of a spirit-lamp, is
applied to the part. From the fo
partial vacuum beneath the cup,

the surrounding surface causes
immediately under the cup to
ressels to become turgid. When
place, the cup is removed, and
s are instantly made by means
or, an instrument containing
ts, which, by means of a spring,
r of incisions at the same mo-
h of these incisions being regu-
of a screw which protrudes or
lancets, according to the vascu-
art, or the quantity of blood to
The cupping-glass is now again
n a sufficient quantity of blood
ted in the cup, it is removed by
ing the nail of one of the fin-
upper edge, by which means,
ved to enter, the cup becomes
part being washed with warm
ve any clots of blood, another
as before, and the operation
l a sufficient quantity of blood
Sometimes, especially when
scalp, the cups fill so rapidly
o become detached almost im-
eing applied. This method of
is frequently called 'CUPPING
ATIONS.'

ng-glasses are applied without
lancet or scarificator, the ope-
l 'DRY CUPPING,' and is much
a speedy irritation of the skin
for the relief of oppressive
l pains, &c. To obtain the full
is operation, the cups should be
main upon the part until they
dation of a small quantity of
nsiderable amount of irritation
ry cupping has been found ex-
cial in poisoned wounds; as it
by abstracting the poison, but
sure the glasses exercise on and
rt, in preventing the absorption

e operation of cupping, a basin
sponges, and clean, soft towels,
vided. In clumsy hands, cup-
nally a severe and painful opera-
is not the case with the skilful
good cupper does not exhaust
ir in the cup before applying it,
ses its mouth rapidly over the
mp. When it is held over the
a few seconds, the compression
f the cup upon the skin is so
checks the flow of the blood to
art. A good cupper also removes
hout spilling the contents, and
whole operation quickly and
e are, however, few persons, who
sional cuppers, who are suffi-
to exhaust the air in the cup by
common lamp; although it is by
A good plan is to rarify the air
means of a small cone of paper,
bit of wine, or strong brandy; this is ignited and thrown in the cup, which is instantly to be applied to the proper spot. Where cupping-glasses and the scarificator are not to be had, wine-glasses, or any very small tumblers, may be substituted for the first; and small incisions by means of a thumb lancet will answer the purpose of the other.

The cicatrices of the scarifications leave permanent marks on the skin; on which account, when blood is to be drawn from the head or neck, the glasses should be applied behind the ears, and a portion of hair removed in such a manner that the part may be covered by what remains.

A most convenient cupping apparatus is manufactured by Mr. Bigg, the eminent surgical-instrument maker of Leicester Square, consisting of cups and an exhausting syringe, so arranged that the use of the spirit-lamp is rendered unnecessary, and the operation of cupping may be performed nearly as expertly by an inexperienced nurse as by the most accomplished professional operator. It is invaluable in places remote from town.

CURAR'INE. The vegeto-alkaline base of curara, urari, woorara, woorali, or wourali, the arrow-poison of Central America.

CURCU'MIN. The yellow colouring matter of turmeric, obtained by digesting the alcoholic extract of the powder in ether, and evaporating the clear ethereal solution to dryness. A brownish-yellow mass, yielding a bright-yellow powder. It is scarcely soluble in water, but very soluble in both alcohol and ether. Boracic and hydrochloric acids redden it; alkalies turn it reddish brown.

CURD. Coagulated casein. See CHEESE.

CUR'RANTS. The currants of our garden are varieties of the *Ribes rubrum* and *Ribes nigrum*. (Linn.) The first includes RED CURRANTS and WHITE CURRANTS; the fruit of both of which are gently acidulous, cooling, and wholesome. The juice makes excellent wine. The fruit of the last (BLACK CURRANTS, QUINSY-BERRIES) is aperitive, and has been used in calculous affections; the juice is made into wine, jellies, jams, lozenges, &c. The young leaves are used as a substitute for tea; one or two buds, or half a small leaf, impart to black tea the flavour and fragrance of green. The currants of the grocers (ZANTE CURRANTS) are a small variety of dried grapes.

CUR'RY. *Syn.* CURRIE. A noted dish in Indian cookery, much esteemed throughout the East. Curries are simply stews, of which rice usually forms a characteristic ingredient, highly flavoured with fried onions and curry powder, to which sliced apples and lemon juice are sometimes added. They are made from every variety of fish, meat, poultry, game, &c., according to the fancy of the parties.

Cur'ry Powder. *Prep.* (Kitchener.) From coriander-seed, ¼ lb.; turmeric, ¼ lb.; cinnamon-seed, 2 oz.; cayenne, ½ oz.; mustard, 1 oz.; ground ginger, 1 oz.; allspice, ½ oz.; fenugreek-seed, 2 oz.; all dried thoroughly, pounded in a mortar, rubbed through a sieve, and mixed together.

Obs. The above must be regarded as merely a substitute for Indian curry powder, which contains many ingredients not to be obtained in England. It should be kept in a bottle closely corked or stoppered. The curry powder sold at the present time consists of coriander seed, turmeric, cayenne, fenugreek-seed, and a large proportion of sago-flour.

CUS'CONINE. See ARICINE.

CUSPA''RIA. *Syn.* CUSPARIA BARK (B.P.), ANGOSTU''RA B.; COR'TEX ANGOSTU''RÆ, C. CUSPA''RIÆ, CUSPARIA (Ph. L. & E.), L. "The bark of *Galipea cusparia*" (Ph. L.), or *Galipea officinalis* (Ph. E.). A valuable drug, imported directly or indirectly from South America.—*Dose.* 10 grs. to 30 grs., as a tonic, stomachic, and febrifuge, in similar cases to those in which CASCARILLA, CALUMBA, and CINCHONA, are commonly given.

Angostura or cusparia bark has fallen into comparative disuse, in consequence of nux vomica or false angostura bark having formerly, in several instances, been mistaken for it, and administered with fatal results. The leading characteristics of these two barks have been pointed out by M. Gibourt, and are as follows:—

Characters.	False Angostura.	True Angostura.
Form . . .	Thick, rugous, rolled upon itself. Edges cut perpendicularly.	Flat or rolled up, little wrinkled, edges beveled.
Colour . .	Brown, or greenish-yellow, presenting protuberances or excrescences, produced by the great development of the corky layer, which has a still more yellow colour.	Grayish-yellow.
Taste . . .	Very bitter	Bitter.
Reaction with Nitric Acid.	Red colour when dropped upon the bark..	Yellow colour.

CUSPAR'IN. *Syn.* ANGOSTU''RIN, ANGOSTU''RA. The bitter principle of Cusparia bark. It is neutral; crystallises in tetrahedrons; is easily fusible; soluble in rectified spirits, in acids, and in alkaline solutions. It is precipitated of a whitish colour by tincture of galls.

CUS'TARD. A composition of milk, or cream, and eggs, sweetened with sugar, and variously flavoured. Custards may be cooked either in the oven or stew-pan.

Prep. 1. (Soyer.) Milk (boiling), 1 pint; sugar, 2 oz.; thin yellow peel of half a lemon; mix, and set it aside for a short time; then take eggs, 4 in no., beat them add, gradually, the milk (not the mixture through a coland fill the custard cups with it; to be placed over the fire in a taining about one inch of hot there for 12 minutes, or till The above is for PLAIN CUS forms a good basis to receive flavouring ingredients, as fresh peels, essences, orange-flower-w other spirits, &c.

2. (Rundell.) As the last, b instead of milk, or equal par with 2 additional eggs. Very last, any suitable flavouring added to it.

3. (ALMOND CUSTARDS,— either of the above, adding almonds, 4 oz.; bitter do., 6 in a smooth paste.

4. (BAKED CUSTARDS,—R cream, 1 pint, with 4 eggs; flav nutmeg, and cinnamon, and ad wine, rose-water, and sugar; b

5. (COFFEE CUSTARDS,—Soy and strong-made coffee, of each, 2 oz.; dissolve, and add it, g eggs (well beaten), and procee Chocolate custards and cocoa made in the same way.

6. (COLD CUSTARD, *for inval* 1 egg; sugar, a table-spoonful; gether; and add, gradually, c ring, cold water, ½ pint; rose spoonfuls; and a little grated agreeable and nutritious demulc glassful every 2 or 3 hours, or *a*

7. (LEMON CUSTARDS,—Ru No. 1 (nearly), using a little mo In the same way orange custa but using orange peel.

b. From candied lemon peel a of each, 2 oz., beaten in a mo and added to either No. 1 or N and citron custards may be ma manner. A little orange-flower- sala, or sherry, may be also add They are best baked.

8. (ORANGE CUSTARDS.) As *a* and *b*.

9. (RICE CUSTARDS,—Rund cupful of the best ground ric milk until dissolved, then mix i of cream; flavour with nutmeg little brandy, and put it into dish.

CUTCH. See CATECHU.

CUTTLE-FISH. The bone *officinalis* of Linnæus, or comn (CUTTLE-FISH BONE; OS SE'PI the law-stationers to erase in paper and parchment, an appli to most schoolboys of the prese Reduced to powder (PUL'VIS SE' a valuable dentifrice and poli

ir forming the moulds for small
a.
ese are incised wounds of greater
it, and must be treated accord-
divided parts should be drawn
r, and held so with small pieces of
adhesive plaster stretched across
If the part is covered with blood,
first wiped with a damp sponge.
and is large, and it is much ex-
method is to sew the parts up.
n of a little creasote or a spirit-
of creasote, will generally stop
g, provided it is applied to the
ties of the wounded vessels. A
o place a piece of lint, moistened
, on the wound, previously wiped
our a drop or two of that liquid
xcellent method is to cover the
lm of collodion. Friar's balsam,
copal varnish, tincture of galls,
er, black ink, &c., are popular
lied in the same way. A bit of
ed from a black beaver hat is an
edy to stop the bleeding from
ced by the razor in shaving.
s said to possess the same pro-

E. *Syn.* Cy'anas, L. A salt in
ydrogen of cyanic acid is replaced
r other basic radical.

ACID. HCNO. *Syn.* Acidum
L. *Prep.* 1. Cyanuric acid, de-
ts water of crystallisation, is dis-
tort, and the product collected in
d receiver.

g.) A current of sulphuretted
s is passed through water in which
ilver is diffused, the process being
before all the cyanate of silver is
.

c. Cyanic acid is a limpid, colour-
it reddens litmus; is sour to the
sses a modified sulphurous odour,
hat which is always perceived when
salts are decomposed by an acid;
ts with the bases, called cyanates;
ntact with water, it suffers decom-
a few hours, and is converted into
of ammonia; it cannot be pre-
any time, as shortly after its pre-
spontaneously passes into a white,
lid mass, to which the name cy-
has been given. By distillation,
ubstance is reconverted into cyanic

DE. *Syn.* Cyan'uret; Cyan'idum,
rum, L. The compound formed by
of cyanogen with a metal or other
See Cyanogen, Hydrocyanic Acid,
spective bases.

, Al'kaline. *Syn.* Crude cyanide
um and sodium. *Prep.* (R. Wag-
y ferrocyanide of potassium, 4 parts,
ate of soda, 1 part, are *melted to-*
crucible at a red heat, and continually stirred until the iron rod comes out covered with a white crust, when the heat is withdrawn, and after a few moments' repose the supernatant liquid portion is poured out on a clean iron slab. This crude mixed cyanide is quite as useful as the more expensive one of Liebig, and is equally fit for technical applications, as electrotyping, gilding, silvering, &c. See Cyanide of Potassium.

CY'ANINE. A base discovered by Mr. G. Williams in chinoline blue. See *below.*

Cyanine, I'odide of. *Syn.* Chin'oline blue. The action of iodide of amyl upon chinoline gives rise to iodide of amylchinoline. Addition of excess of soda to an aqueous solution of this iodide produces a black resinous precipitate, which dissolves in alcohol with a magnificent blue colour. This precipitate is the iodide of cyanine, or chinoline blue. Many attempts have been made to use it in dyeing; they have, however, failed on account of the instability of the colour.

CYAN'OGEN. CN or Cy. A highly important compound radical or quasi element, discovered by M. Gay Lussac in 1815.

Best obtained by carefully igniting dry cyanide of mercury in a small retort, and collecting the gas over mercury.

Prop., &c. A colourless gas, possessing a pungent and peculiar odour, resembling that of peach-kernels or prussic acid; under a pressure of about 4 atmospheres, at a temperature of 45°, it assumes the liquid form (Faraday), and this fluid again becomes gaseous on withdrawal of the pressure; water absorbs nearly 5 times its bulk of cyanogen at 60° Fahr., and alcohol about 23 times its volume; with hydrogen it forms hydrocyanic acid, and with the metals a most interesting and important class of bodies called cyanides or cyanurets; when kindled, it burns with a beautiful purple flame, carbonic acid and nitrogen being evolved. Sp. gr. 1·806. See Hydrocyanic Acid, &c.

Forms a bromide and iodide when the cyanide of mercury is distilled with bromine or iodine, and which are colourless, volatile, highly poisonous solids; and two isomeric chlorides, one a very volatile liquid, prepared by passing chlorine over moist cyanide of mercury, and the other in white volatile needles, prepared by exposing aqueous hydrocyanic acid to chlorine in sunshine.

CYANU''RIC ACID. $H_3C_3N_3O_3$. *Syn.* Pyro-u''ric açid†. A peculiar acid, discovered by Scheele. It is a product of the decomposition of the soluble cyanates by dilute acids, or of urea by heat, &c.

CY'DER. See Cider.

CY'DONINE. The peculiar gum of quince seed. It resembles bassorin in most of its properties.

CY'MIDINE. An oily base, homologous *with aniline, obtained* by the action of iron *filings and acetic acid* on nitro-cymol.

CY'MOL. A peculiar hydrocarbon found in oil of cumin, in admixture with cuminol. The two bodies are separable in a great measure by distillation, cymol being the most volatile portion of the oil.

CY'NAPINE. An alkaloid obtained from *Æthusa cynapium*, or *fool's parsley*. It possesses no practical interest.

CYST'INE. $C_3NH_7SO_2$. *Syn.* CYST'IC OXIDE. Obtained from cystic oxide calculi (in powder) by digestion in solution of ammonia. By spontaneous evaporation the ammoniacal solution deposits small, colourless crystals of cystic oxide. It forms a saline compound with hydrochloric acid, and is decomposed by the strong alkalies.

CY'TISINE. A purgative bitter principle, extracted from the *Cytisus Laburnum* (Linn.), or *common laburnum*, and some other plants.

DAGUERRE'OTYPE. See PHOTOGRAPHY.

DA''HLIA DYE (dāle'-y'ă). The shade of colour which is commonly termed 'dahlia' is a reddish lilac. It is produced by combining a blue or purple with red when a compound colour is used. Upon wool and silk it can be obtained directly by means of archil or cudbear, either alone or 'blued' by a small quantity of sulphate of indigo. Upon cotton indifferent shades of dahlia are obtained by macerating in sumac liquor, working in tin solution, and dyeing in logwood mixed with some red wood.

DA''HLINE. A species of fecula obtained from the tubers of the dahlia. It is identical with inuline. It is not employed in the arts.

DAIR'Y. The place where milk is kept, and cheese and butter made. The best situation for a dairy is on the north side of the dwelling-house, in order that it may be sheltered from the sun during the heat of the day. Ample means should be provided to ensure ventilation, and at the same time to exclude flies and other insects. The temperature should be preserved, as much as possible, in an equable state, ranging from 45° to 55° Fahr. To lessen the influence of external variations of temperature, the walls should be double, or of considerable thickness, and the windows provided with shutters or doors. In summer the heat may be lessened by sprinkling water on the floor, which will produce considerable cold by its evaporation. Dairies built of mud or 'cob' are preferred in the West of England; and this preference arises from the uniform temperature they maintain, on account of the great thickness of the walls, and their being very bad conductors of heat. In large dairy-farms, where butter and cheese are made, the dairy is generally a separate building, and divided into 3 or 4 apartments; one of which is called the 'milk-room;' a second, the 'churning-room;' a third, the 'cheese-room,' containing the cheese-press, &c.; and a fourth, the 'drying-room,' where the chees
dry and harden. To these m
scullery, furnished with boiler,
scalding and cleaning the dairy

Cleanliness is very essential
rations of the dairy, and in no
in the milking of the cows.
arms of the milkmaid should b
lously clean, and should be we
soap and water after touching
sick cow, as without this preca
may be conveyed to the heal
milk-cans should be scalded ou
well as all the other dairy ute
kept clean and dry. Before p
on the shelves of the dairy, it sh
through a hair sieve or a sear
clean cheese-cloth, as by this
stray hairs that may have falle
pail will be taken out.

The average produce of a
plied with good pasturage, is
daily from Lady-day to Michae
that time to February about
Cows of good breed will be pro
to 14 or 15 years of age, if
BUTTER, CHEESE, CREAM, &c.

DAMAS'CUS BLADES. See

DAMP, under any form, shou
A humid atmosphere or situatio
commonest causes of agues, ast
tism, and numerous other disea

Damp Linen is very injurious,
especially avoided. In travelli
expected that the bed has not
aired, a good plan is to slee
blankets. To ascertain this poi
be warmed, and a cold, dry,
immediately afterwards introd
the sheets, in an inverted posi
has remained a few seconds,
examined, when, if it is found
dimmed by steam, it may be f
that the bed is well aired; but
should be the case, it should be a
it is impossible to prevent the
linen, as articles of dress, the
obviate any ill effects is to kee
motion, and avoid remaining n
in a warm apartment, or in a d
air, until sufficient time has el
of the escape of the moisture.
evaporation is the reduction of t
of the body; hence the depres
damp linen.

Damp Walls. Ivy planted aga
wall of a house is said to excl
If a wall is already damp, ivy p
it will, when grown up, cause it
provided the brickwork is sound,
ness does not arise from mois
upwards from the foundation.
when ivy is propagated from flow
it will not adhere to a wall at a
get over this difficulty is to cut i
the surface of the ground. Th

orm will take hold and cling
most anything.

species of small black plum,
ıe preparation of tarts, &c.
her apt to disagree with deli-
ıd also to affect the bowels.

he practice of dancing as an
ercise must be almost as old
e itself. Yet, notwithstand-
and prevalence amongst all
barous and refined, the pro-
tages of its cultivation are of
le character. In a hygienic
an claim no preference, as an
more simple ones of walking
ilst, from the associations it
es, and the heated and con-
in which its votaries com-
to indulge in it, it becomes
nt of immorality and con-
lebrated cyclopædist has, per-
at truthfully, defined dancing
amusement for the idle and

. *Syn.* PISS-A-BED; TARAX'A-
& D.), L. A common British
tural order *Compositæ*. It is
otanists by the names *Taraxa-*
T. dens leonis, and *Leontodon*
m.). Its root (*Taraxaci Radix*,
yed in medicine, being diuretic
is roasted and used as coffee,
ed with an equal weight of
constitutes the article once so
nder the name of 'dandelion
lar mixture prepared with cho-
e 'dandelion chocolate' of the
nched leaves are used in salads,
ated juice, extract, and decoc-
yed in medicine, and are con-
tergent, aperitive, and deob-
nd roasted dandelion root can-
d under the name of 'dandelion
d with coffee unless it has pre-
he chicory duty. See DECOC-
r, &c.

BATTERY. See VOLTAIC ELEC-

A peculiar bitter principle,
Vauquelin in the *Daphne meze-*
reon. It is procured by sepa-
in from the alcoholic tincture of
vaporation; afterwards, diluting
ith water, filtering, and adding
ad. A yellow substance falls
when decomposed by sulphuretted
lds daphnin, under the form of
s, transparent, radiated needles.
volatile; sparingly soluble in cold
y soluble in hot water, and in
ther. It possesses basic proper-
[illegible].

Syn. THORN-APPLE; STRAMO'-
E & D.), L. *A genus of plants*
the nightshade order, or 'Atropacea.' The species *Datura Stramonium* is an important medicinal plant, the leaves and seeds being officinal in B. P. It is anodyne and sedative, but not hypnotic, though it will often induce sleep by relieving pain. It affects the constitution in much the same way as belladonna.—*Dose.* 1 to 4 or 5 grs., in asthma, gout, headache, neuralgic and rheumatic pains, &c. In spasmodic asthma smoking the leaf often gives instantaneous relief, but must be exhibited with care, as the whole plant is intensely poisonous. No antidote is known. Another species, namely, *Datura tatula*, is now preferred for cigars or cigarettes. Cigars are made from *Datura Stramonium* more frequently than from *Datura tatula*. They are recommended for asthma. See ASTHMA, CIGARS (Stramonium), DATURIA (*below*).

DATU'RIA. *Syn.* DATU'RINE, DATURIN'A, HYOSCY'AMINE. An organic alkali, discovered by Geiger and Hesse in *Datura Stramonium* or thorn apple. It occurs also in *Hyoscyamus niger* or henbane. It is best obtained from the seeds. Daturia dissolves in 280 parts of cold and 72 parts of boiling water; it is very soluble in alcohol, less so in ether. It tastes bitter, dilates the pupil strongly, and is very poisonous. It may be sublimed unaltered, and may be obtained in prismatic crystals by the addition of water to its alcoholic solution. With the acids it forms salts, which are mostly crystallisable.

DEAF'NESS. An imperfection or absence of the sense of hearing. When deafness is present in infancy and childhood, it is accompanied with dumbness, or imperfect articulation, in consequence of the impossibility of conveying a knowledge of the sounds necessary for the exercise of the imitative faculty of speech. Deafness frequently arises from some imperfection or obstruction of the passage leading to the membrane of the tympanum or drum of the ear. In some cases this passage is totally occluded by a membrane, or some malformation of the tube, which may frequently be removed by a surgical operation. Even instances of partial obliteration of this passage have occurred, which have been successfully treated. The researches of Mr. Yearsley have established the fact, that enlarged tonsils are a very common cause of deafness; and when such is the case, their excision will generally effect a cure. To this form of the affection Mr. Yearsley applies the term 'throat deafness.' Another cause of deafness is the presence of foreign bodies in the aural passages, or the accumulation of hardened wax. In these cases the best treatment is to inject warm water into the ear by means of a proper syringe. When deafness arises from imperfection of the tympanum or drum of the ear, the effects of the application of the artificial membrana tympani invented by Mr. Yearsley (*moistened cotton wool*) are generally immediate and truly wonderful. By its aid persons previously so deaf as to be incapable of bearing their share in conversation have been enabled to hear an ordinary whisper. Insects may be destroyed by pouring a spoonful of warm olive oil, or camphorated oil, into the ear over night, retaining it there until the next morning by means of a piece of cotton wool, when it may be washed out with a little mild soap and warm water. When there is a deficiency of the natural secretion of wax, or a dryness of the aural passage, mild oleaginous stimulants may be employed. For this purpose a little olive or almond oil, to which a few drops of oil of turpentine, oil of juniper, or camphor liniment, have been added, may be used with advantage. A piece of cotton wool moistened with glycerine is an excellent application in such cases. When deafness is accompanied with continued acute pain, or a discharge of purulent matter, inflammation of the tympanum, or some other portion of the internal ear, probably exists, and medical advice should be sought as soon as possible. The deafness that frequently accompanies a violent cold is generally caused by obstructions in the Eustachian tubes, and goes off as soon as the secretions return to a healthy state. In some forms of deafness blisters behind the ears are useful. A clove of garlic wrapped in cotton or gauze, or a few drops of the juice introduced into the ear, is extremely efficacious in nervous deafness. When imperfect hearing depends upon obtundity of the auditory nerve, or an extensive obliteration or malformation of the internal ear, it scarcely admits of cure.

Deafness, Taylor's Remedy for. *Prep.* From oil of almonds, 1 lb.; garlic, bruised, 2 oz.; alkanet root, ½ oz.; digest for a week, and strain. A little is poured into the ear in deafness.

DEATH. In cases of sudden death interment should be deferred till signs of putrefaction begin to appear, especially when no gradation of disease has preceded, as in cases of apoplexy, hysterics, external injuries, drowning, suffocation, &c. No sooner has breathing apparently ceased, and the visage assumed a ghastly or a death-like hue, than the patient, after his eyes are closed, is too often hurried into a coffin, and the body, scarcely yet cold, is precipitated into the grave. So extremely fallacious are the signs of death, that the semblance has been frequently mistaken for the reality. By prompt means and judicious treatment, many persons, when in such a condition, have been happily restored to their families and friends. The effects of sound upon animal life is astonishing. The beat of a drum, for instance, has had a very beneficial effect upon persons in a state of suspended animation. At one time, a scream, extorted by grief, proved the means of resuscitating a person who was supposed to be dead, and who had exhibited the usual recent marks of the extinction of life. In cases of catalepsy or trance, having the semblance of death, the action of t
heart continues, though in a n
ceptible degree. By placing a c
piece of highly polished metal
over the mouth of the patient,
moisture will appear upon the s
most feeble respiration takes plac

DEBIL'ITY. *Syn.* DEBIL'ITAS
ness; languor; feebleness. Wh
from a diseased action of the
occasional use of mild aperients,
bitters and tonics, may be had
When from a general laxity of t
there are no symptoms of fever, n
of blood to the head, a course o
generally proves advantageous.
ATROPHY, &c.

DECANTA'TION. The operati
or drawing off the clear portio
from the impurities or grosser m
subsided. It is commonly perf
by gently inclining the vessel, o
of a syphon or pump. In the la
much resorted to in the purific
cipitates, or other similar opera
repeated edulcoration or washin
for which purpose it is preferable
from being less troublesome and
mical. In these cases, after a s
having been allowed for the subsi
precipitate or powder, or for th
the supernatant fluid, the latter
and its place supplied by a fres
water, which, after sufficient agit
larly treated, and the whole operat
as often as necessary.

DECANT'ERS. There is often
culty experienced in cleaning de
cially after port wine has stood
some time. The best way is to
out with a little pearlash and
adding a spoonful or two of fresh-
if necessary. To facilitate the a
fluid against the sides of the glass
cinders or pieces of raw potato
A spoonful of strong oil of vitr
rapidly remove any kind of dirt
bottles. Decanters which have b
by holding hard water may be cle
spoonful of hydrochloric acid ('spi
diluted with 3 or 4 times its weig
See STOPPERS.

DECARBONISA'TION. This c
performed on cast iron, to con
soft iron. The articles to be
are packed in finely powdered h
native oxide of iron, to which iro
often added, and exposed for so
strong red heat, by which the exc
is abstracted or burnt out. The p
what resembles annealing or ceme

DECAY'. See EREMACAUSIS.

DEC'IMALS. *Syn.* DECIMAL
Fractions which have for their
10, or some power of ten; as 10
the number of ciphers in the

ual to the number of figures
tor. Thus, ·2, ·25, ·125, re-
ent $\frac{2}{10}$, $\frac{25}{100}$, $\frac{125}{1000}$. The denomi-
ls is never written, the dot
e first figure of the numerator
value. Ciphers placed on the
decimal fraction do not alter
5, ·50, ·500, are each equal to
placed on the left hand of a
h its value in a tenfold pro-
3, ·03, ·003, respectively answer
fractions $\frac{3}{10}$, $\frac{3}{100}$, and $\frac{3}{1000}$.
the left hand side of the dot
is a whole number.

d SUBTRACTION OF DECIMALS
in the same manner as with
ers, care being taken to place
nder each other according to
values; as, tens under tens,
r hundreds, &c.

TION OF DECIMALS is performed
e same manner as with whole
ly pointing off as many figures
t as there are decimals in the
multiplicand put together.

F DECIMALS. As the last, but
s many figures in the quotient
d places in the dividend exceed
livisor. If there are not figures
quotient, the deficiency must be
fixing left-hand ciphers. Ciphers
to the right hand of the dividend,
der, when there are more figures
than in the dividend, by which
may be carried on to any extent.
action is reduced to a decimal
the numerator (increased suffi-
ciphers) by the denominator.
=·125, &c.

f a decimal, of any denomination,
multiplying it by the number of
next less denomination, and
many places to the right hand
decimals, and so on until the
hausted. Thus, ·634 oz. is =

·634
8
———
5·072 drachms.
60
———
4·320 grains.
———

grs. (nearly).

ant use of decimals in the labo-
he surveys of the Excise, and in
emical calculations, induces us to
ject on the attention of operatives
neglected education. An atten-
of the above, and a few hours'
will make the matter familiar

Syn. **DECOC′TUM**, L. An
of the active principles of any
tained by boiling; ***also the pro-***
ing such solutions.

The effect of decoction in water differs greatly from that of infusion. At the temperature of 212° Fahr., the essential oils and aromatic principles of vegetables are dissipated or decomposed; while by infusion in hot water, in covered vessels, they remain for the most part uninjured. The solvent powers of boiling water are, however, much greater than those of hot water; and many vegetable principles scarcely acted on by the one are freely soluble in the other. This is the case with many of the alkaloids, on which the medicinal virtues of several vegetables depend. On the other hand, the solutions of many substances, though more readily made by boiling, are speedily weakened or rendered inert by ebullition, in consequence of the active principles being either volatilised along with the steam, or oxidised or decomposed by exposure to the atmosphere. This is particularly the case with substances abounding in extractive or astringent matter. When the medicinal properties of vegetables are volatile, or are injured by a strong heat, infusion should be had recourse to, in preference to boiling; but when a solution of the fixed constituents is alone sought, decoction is preferable.

The substances employed for making decoctions should be well bruised, or reduced to a very coarse powder, or, if fresh and soft, they should be sliced small. In the former case, any very fine powder or adhering dust should be removed with a sieve, as its presence tends to make the product thick and disagreeable, and also more troublesome to strain. The vessel in which the ebullition is conducted should be furnished with an accurately fitting cover, the better to exclude the air; and the application of the heat should be so conducted that the fluid may be kept simmering, or only gently boiling, as violent boiling is not only quite unnecessary, but absolutely injurious to the quality of the product. In every case the liquor should be strained whilst hot, but not boiling, and the best method of doing this is to employ a fine hair sieve, or a coarse flannel bag. In general, it is found that, as decoctions cool, a sediment is formed, in consequence of the boiling water dissolving a larger portion of vegetable matter than it can retain in solution when cold. This deposit for the most part consists of the active principles of the solution, and, unless when otherwise ordered, should be mingled with the clear liquid by agitation, when the decoction enters into extemporaneous compositions, or when the dose is taken.

The length of time occupied by the ebullition is another point demanding some attention. Long boiling is in no case necessary, and should be avoided, especially in decoctions prepared from aromatic vegetables, or those abounding in extractive. The Colleges, in such cases, direct the ingredients "to be boiled for a *short time*," or "*for 10 minutes*;" or they *limit the period of* the ebullition by stating the quantity that must be volatilised, as—"boil to a pint, and strain." The last method is generally employed for those substances that do not suffer by lengthened boiling.

In preparing compound decoctions, those ingredients should be boiled first which least readily give up their active principles to the menstruum, and those which most readily part with them should be added afterwards. In many cases it is proper simply to infuse the more aromatic substances in the hot decoction of the other ingredients, by which means their volatile principles will be the better preserved.

Distilled water, or perfectly clean rain water, should alone be used for decoctions, extracts, and infusions. Spring and river water, from containing lime, have much less solvent power.

The aqueous solutions of organic matter, from the nature of their constituents, rapidly ferment or putrefy, at the ordinary temperature of the atmosphere. Neither decoctions nor infusions are fit to be used in dispensing, unless made the same day. They should, consequently, be only prepared in small quantities at a time, and any unconsumed portion should be rejected, as it would be imprudent for the dispenser to risk his own reputation, and the welfare of the patient, by employing an article of dubious quality.

It has of late years become a general practice for the wholesale houses to vend preparations under the name of 'Concentrated Decoctions,' which, with the exception of the compound decoction of aloes, are stated to be of 8 times the pharmacopœial strength; so that one drachm of these liquids added to seven drachms of water, forms extemporaneous decoctions, professedly resembling those of the pharmacopœia. The decoction of aloes is made of only four times the usual strength, as the nature of its composition would not permit of further concentration. Such preparations are, however, very imperfect substitutes for the freshly made decoctions. The extreme difficulty of forming concentrated solutions of vegetable matter with bulky ingredients, too often leads to the omission of a portion of the materials, or to the practice of concentrating the liquid by long evaporation. In the first case, the strength is, of course, less than it should be; and in the second, the quality is injured, and perhaps the preparation is rendered nearly inert by the lengthened exposure to heat, and the consequent volatilisation or decomposition of its active constituents. The common practice of adding a considerable portion of spirit to these preparations, which is absolutely necessary to preserve them, is also objectionable, as, in many of the cases in which decoctions are prescribed, this article, even in small quantities, exerts a prejudicial action. Some concentrated decoctions have been recently offered for sale which do not contain alcohol, being preserved by the addition of sulphurous acid, or sulphite of

Decoction of Al'oes. *Syn.* Co
A., BALSAM OF LIFE; BAUME
DECOCTUM AL'OËS (Ph. E.), D.
TUM (B. P. & Ph. D.), L. *Pr*
Extract of liquorice, 1 oz.; extr
aloes, powdered myrrh, and sa
1½ dr.; carbonate of potassa, 1
cardamoms, 8 ozs.; water, a suffic
powder the extract of aloes a
put them, together with the ca
ash and extract of liquorice,
vessel, with a pint of distille
gently for five minutes, then ad
let the vessel with contents coo
tincture of cardamoms, and, cove
closely, allow the ingredients t
hours, finally strain through f
as much distilled water over
the strainer as will make the p
30 oz.

2. (Ph. E.) Aloes, myrrh,
each, 1 dr.; extract of liquori
bonate of potassa, 40 grs.; w
boil to 12 fl. oz.; strain, and ad
tincture of cardamoms, 4 fl. oz,

3. (Ph. D.) As No. 1 (nea
hepatic aloes.

A warm cathartic.—*Dose.*
habitual costiveness, dyspepsia,

Obs. By boiling the saffron
the Dublin and Edinburgh Coll
whole of its fragrance is dissip
plan is to macerate it in the tin
days, previously to adding the
coction of the other ingredien
tincture has been strained off f
the latter may be washed with a
remove any adhering colour and
may be added to the decoction.
of the tincture produces a dep
ginous and feculent matter,
dissolved out of the liquorice, f
some houses omit the latter altog
ply its place with an equal quan
treacle, and a little colouring.
the liquid, after being once obt
continue so for any length of ti

4. (Wholesale.) Solazzi juic
(carbonate of potassa), 4 oz.;
5½ oz.; myrrh (small), 5 oz.;
boil to 3 galls., strain throug
and add, of compound tincture
10 pints; previously digested
saffron, 2½ oz.; mix well, and
oil of nutmeg, 15 drops; oils of
way, of each, 10 drops; and oi
pimento, of each, 5 drops; i
the clear portion from the sed
serve it in a cool place.

5. (Concentrated; D. A. C
L.)—*a.* Lump sugar, 8 oz.; co
carbonate of potash, 2 oz.;
myrrh and saffron, of each, 2½
tincture of cardamoms, ½ a
pints; boil the first five in t
reduced to nearly one half;

ualy digested for a week, on the
oceed as above. 14 oz. of ex-
:e may be used instead of the
ring.

rh, liquorice, and potassa (all
l saffron, as last; compound
damoms, 5¾ pints; digest a
filter. In this way a very
utiful preparation is produced,
. much admired. The above
s four times the strength of
aration.

aticol'ic. *Syn.* ANTICOLIC
AND'S COLIC MIXTURE; APOZ'-
UM, L. *Prep.* Senna leaves,
ater, 1 pint; simmer gently
ss out the liquor, add sulphate
yrup of buckthorn, 2 oz., and
lannel. *Used* by glassfuls in
er poisoning by lead.

ntidar'trous. Decoction of
e *below*).

Ar'nica. *Syn.* DECOCTUM
rep. 1. (Swediaur.) Flowers
tana, 1 oz.; water, 3 pints;
.; filter, and add of syrup of
Dose. 1 to 2 fl. oz., every two
; in aphonia, paralysis of the
les, rheumatism, &c.; and as a
ark, in putrid fever, agues, &c.
: Aust., 1841.) Arnica root,
9 oz.; boil to 6 oz., and strain.
, as the last.

Astrin'gent. *Syn.* DECOCTUM
L. *Prep.* (Swediaur.) Oak-
nate peel, and tormentil root, of
water and milk, of each, 1 lb.;
s, add of cinnamon, 2 drs.; boil
s longer, and strain.—*Dose.* A

f Bark. *Syn.* DECOCTION OF
DECOCTUM CINCHO'NÆ, L. *Prep.*
a. (D. OF YELLOW B.; D. CIN-
.) Yellow cinchona or calisaya
), 1¼ oz.; distilled water, 1 pint;
inutes in a lightly covered vessel;
train and pour on the marc suffi-
to make up 1 pint.

PALE B.; D. C. PALLIDÆ, Ph. L.)
nchona or loxa bark, as above (*a.*).

RED B.; D. C. RUBRÆ, Ph. L.)
rk, as above (*a.*).

.) Brown, gray, yellow, or red
ruised), 1 oz.; water, 24 fl. oz.;
minutes; when cold, filter the
evaporate it to 16 fl. oz.

) From pale or loxa bark, similar
ectum cinchonæ pallidæ' of Ph.
ore).

1 to 2 fl. oz., 3 or 4 times daily,
omachic, and febrifuge, when the
l not bear the administration of
der; in fevers, dyspepsia, conva-
. The plan recommended by the
College, *of filtering the decoction*
aloud. According to Soubeiran,
146 grs. of the deposit thus removed contained 86 grs. soluble in alcohol, and rich in the cinchona alkaloids. This liquid should, therefore, be well shaken before pouring it out for use, instead of being filtered. The addition of a few drops of either sulphuric or hydrochloric acid to the water greatly increases its solvent power, and also, consequently, the medicinal value of this preparation. (See *below.*)

Decoction of Bark (Acid'ulated). *Syn.* DECOCTUM CINCHONÆ ACIDULA'TUM, L. *Prep.* 1. To the water for any one of the above, add dilute sulphuric acid, 1¼ fl. dr.; boil 10 minutes, and strain whilst hot.

2. (Sir J. Wylie.) Cinchona bark, 1 oz.; water, 16 fl. oz.; diluted sulphuric acid, 1 dr.; as last.

Decoction of Bark (Facti"tious). *Syn.* DECOCTUM CINCHONÆ FACTITIUM, L. *Prep.* (Ph. Bor.) Willow bark and horse-chestnut bark, of each, ½ oz.; calamus root and cloves, of each, ¼ oz.; water, 16 fl. oz.; boil to one half. *Used* as a substitute for decoction of cinchona bark, but is vastly inferior.

Decoction of Bark and Ser'pentary. *Syn.* DECOCTUM CINCHONÆ CUM SERPENTA'RIÂ, L. *Prep.* (Sir J. Pringle.) Peruvian bark, 3 drs.; water, 1 pint; boil to one half, and infuse in the hot decoction, serpentaria root, 3 drs. As a diaphoretic stimulant, and tonic, in fevers, and as a gargle in sore throat.

Decoction of Bar'ley. *Syn.* BARLEY-WATER; DECOCTUM HOR'DEI (B. P.), L. *Prep.* 1. (B. P.) Pearl barley, 1 oz. (washed clean); boil for twenty minutes in 15 oz. of water, and strain.

2. (Ph. D.) Similar to above. (See *Obs. below.*)

Decoction of Barley (Compound). *Syn.* PEC'TORAL DECOCTION, FE'VER DRINK; DECOCTUM PECTORA'LE, PTISAN'A COMMU'NIS, DEC. HOR'DEI COMPOS'ITUM (Ph. L.), MISTU'RA HOR'DEI (Ph. E.), L. *Prep.* 1. (Ph. L.) Decoction of barley (simple), 1 quart; figs (sliced) and raisins (stoned), of each, 2½ oz.; fresh liquorice (sliced), 5 drs.; water, 1 pint; boil to a quart, and strain.

2. (Ph. E.) Pearl barley, 2½ oz.; water, 4½ pints; boil to 3 pints; add figs and raisins, of each, 2½ oz.; liquorice root, 5 drs.; water, 1 pint; and boil to 2 pints, as before.

Obs. The above are used as demulcents in fevers, phthisis, strangury, &c., taken *ad libitum.* They are slightly laxative, and when this would be an objection to their use, a few drops of laudanum may be added. Mixed with an equal quantity of decoction of bark, barley-water forms an excellent gargle in cynanche maligna (ulcerated sore throat), and, with a like quantity of milk and a little sugar, a good substitute for the breast in dry nursing infants. It is, also, often acidulated with lemon juice or sulphuric acid, and sweetened (Decoctum hordei *acidulatum*). Gum arabic, 4 drs., *and nitre, 1 dr., to* each pint, is a common *addition in gonorrhœa.* Cream of tartar, 1 dr., is occasionally added to render it more aperient.

Decoction, Bit'ter. *Syn.* DECOCTUM AMA'RUM, L. *Prep.* 1. Dried tops of lesser centaury and wormwood, and leaves of germander, of each, 3 drs.; water, 1½ pint; boil to a pint.

2. Gentian root, ½ oz.; water 1½ pint; boil 10 minutes, take out the root, slice it, and add it again to the decoction with dried orange peel, ¼ oz.; boil to 1 pint, and strain.

Decoction of Bitter Sweet. *Syn.* ANTIDAR'TROUS AP'OZEM; APOZ'EMA DULCAMA''RÆ, L. *Prep.* (Trousseau and Reveille.) Dulcamara, 1 dr.; water, 16 oz.; boil to 9 oz., and strain. To be taken in three doses during the day. Every other day the quantity is to be increased until 12 drs. or even 2 oz. are taken daily, "so that the patient may begin to feel dryness of the throat, and some disorder of vision and digestion;" and "continue at this quantity for several weeks in succession." In obstinate skin diseases. See DECOCTION OF DULCAMARA.

Decoction of Blue Cardinal Flowers. *Syn.* DECOCTUM LOBEL'IÆ, D. L. SYPHILIT'ICÆ, L. *Prep.* 1. (P. Cod.) Root of *Lobelia syphilitica*, 1 handful; water, 12 lbs.; boil to 7 lbs., and strain.

2. (Swediaur.) Dried root, 5 oz.; water, 12 lbs.; as last. Alterative, purgative, and diuretic.

Obs. This decoction was strongly recommended by Swediaur in certain complaints. He gave half a pint, at first, twice daily, and afterwards 4 times a day, unless it acted too strongly on the bowels, when the frequency of the dose was diminished, or it was discontinued for 3 or 4 days, and then had recourse to again, until the cure was effected.

Decoction of Bran. *Syn.* DECOCTUM FURFURIS, L. *Prep.* 1. From bran, ¼ lb.; water, 1¼ pint; boil to a pint. In diabetes; and sweetened with sugar, as a demulcent and laxative in cough and sore throat.

2. Bran, 1 quart; water, 1½ gal.; boil 5 minutes, and add, cold water, q. s. to bring it to the proper temperature. As an emollient foot-bath.

Decoction of Broom. *Syn.* DECOCTUM SPAR'TII CACUMIN'IUM; D. SCOPA''RII (Ph. D.), L. *Prep.* (Ph. D.) Broom-tops (dried), ½ oz.; water, ½ pint; boil 10 minutes, and strain. (See *below*.)

Decoction of Broom (Compound). *Syn.* DECOCTUM SPAR'TII CACUMINIUM C., D. SCOPA''RII (Ph. E.), D. S. COMPOS'ITUM (Ph. L.), L. *Prep.* 1. (Ph. L.) Tops of broom (recent and dried), juniper berries (bruised), dandelion root (bruised), of each, ½ oz.; distilled water, 1½ pint; boil to a pint, and strain.

2. (Ph. E.) Tops of broom and juniper, of each, ½ oz.; cream of tartar, 2½ drs.; water, 1½ pint; boil to a pint, as last. The above are diuretic and laxative.—*Dose.* ½ to 1 wine-*glassful*, 3 or 4 times a day; in dropsy, espe-
f the belly (ASCITES).

Decoction of Bur'dock. *Syn.*
ARC'TII, D. BARDA'NÆ, L. *Prep.*
root, 6 oz.; water, 5 pints; boil
and strain.

2. (Wood.) Dried root, 2 oz.;
pints; boil to 2 pints, and
alterative; a pint, or more, daily,
cases in which sarsaparilla is reco

Decoction of Cabbage-tree Bark.
TUM GEOFFROYÆ (Ph. E. 1817),
MIS (Ph. D. 1826). *Prep.* (Ph.
of the cabbage tree (bruised), 1 oz.;
quart; boil to a pint, and strain.
narcotic, and anthelmintic.—*Dose.*
table-spoonfuls, for an adult; 1 to
fuls, for a child, followed by
castor oil; in worms, &c.

Decoction of Calumba (Compound
DECOCTUM CALUM'BÆ COMPOS'ITUM,
(Ph. U. S. 1831.) Calumba and
each, 2 drs.; orange peel, 1 dr.;
grs.; carbonate of potassa, 30 grs.;
fl. oz.; boil to 16 fl. oz., strain, and,
add of compound tincture of lavender,
Bitter, tonic, and stomachic.—*Dose.*
table-spoonfuls, 3 or 4 times daily.

Decoction of Cey'lon Moss. *Syn.*
FU''CI AMYLA'CEI, D. PLOCA''RIÆ
Prep. From Ceylon moss, 2 drs.;
or whey, 1 pint; boil to 16 fl. oz.,
It may be sweetened and flavoured.
tation of the mucous membranes
phthisis.

Decoction of Cham'omile. *Syn.*
ANTHE'MIDIS, D. CHAMÆMELI, L.
momiles, 1 oz.; boiling water, 1 pint;
for 10 minutes, simmer gently for
minutes longer, and strain with
below.)

Decoction of Chamomile (Compound).
DECOCTUM CHAMÆMELI COMPOSITUM
Prep. (Ph. D. 1826.) Chamomile
(dried), ½ oz.; fennel seed, 2 drs.;
oz.; boil a short time, and strain.
above are bitter, stomachic, and tonic;
is vermifuge. They are chiefly used
tations and clysters.

Decoction of Chiret'ta. *Syn.*
CHIRAYTÆ, L. *Prep.* From chire
rata, 5 drs.; water, 1 pint; boil 8
utes and strain.—*Dose.* ½ to 1
2 or 3 times daily, as a stomachic
flatulency and acidity, especially in
pepsia of gouty persons.

Decoction of Cincho'na. See DEC
BARK.

Decoction of Col'ocynth. *Syn.*
COLOCYNTH'IDIS, L. *Prep.* (Ph.
cynth pulp, 1 dr.; water, 8 oz.;
utes, and when quite cold, add of
orange peel, 1 oz.; sulphuric ether
Dose. 2 to 6 drs., 2 or 3 times
dropsy, &c.

Decoction of Colts'foot. *Syn.*
TUSSILAG'INIS, L. Prep. (Pereira.)
leaves of coltsfoot, 2 oz. (or, flowe

oil to a pint and strain. A
.n chronic coughs and chest
emollient and demulcent.—
cupful, *ad libitum.* (See

Coltsfoot (Compound). *Syn.*
ILAGINIS COMPOSITUM, L.
Coltsfoot flowers, 6 oz.; figs,
xes, of each, 2 oz.; water, 12
a to 4 pints; add liquorice
boil, and strain. As the last.
ction. See DECOCTION OF

x'sican Moss. *Syn.* DECOCTUM
rI, L. *Prep.* From the moss,
½ pint; boil to a pint.—*Dose.*
, three times a day; as a ver-
22, Mr. Farr brought it for-
ly for cancer.

ot'ton Root. *Syn.* DECOCTUM
Prep. (Dr. Bouchelle.) Inner
t of the cotton plant, 4 oz.;
boil to a pint.—*Dose.* A wine-
nally, as an emmenagogue; or,
0 minutes, to produce uterine
r which purpose it is said to be
ergot of rye.

Dandeli'on. *Syn.* DECOCTUM
P.), L. *Prep.* 1. (B. P.) Fresh
(bruised), 1 oz.; water, 1½ pint;
and strain.

Herb and root (fresh), 7 oz.;
t; boil to a pint. Aperient, sto-
nic.—*Dose.* 1 to 2 fl. oz., or more,
laily.

c Decoction. *Syn.* DECOCTUM
UM, L. Decoction of bark, 1
of acetate of ammonia, 4 oz.;
fection, 1 oz.—*Dose.* 2 or 3 table-
ery 3 hours.

of Dog-grass. *Syn.* DECOCTUM
L.; PTISANE CHIENDENT, Fr. *Prep.*
ass root (*Triticum repens*), 1 oz.;
ot, ½ oz.; water, 1 quart; boil 20
d strain. Aperient and pectoral;
ad libitum. (See *below.*)

of Dog-grass (Ioduret'ted). *Syn.*
GRAMINIS IODURE'TUM, L. *Prep.*
) Decoction of dog-grass, 32 fl. oz.;
ppermint, 2 oz.; iodide of potassium,
. By cupfuls, *ad libitum.*

of Dog-wood. *Syn.* DECOCTUM
LORIDÆ, L. *Prep.* (Ph. U. S.) Dog-
(bruised), 1 oz.; water, 1 pint: boil
s, and strain whilst hot. Tonic and
; recommended as a substitute for
e. A wine-glassful.

of Dulcama''ra. *Syn.* DECOCTION
SWEET, D. OF WOODY NIGHTSHADE;
DULCAMA''RÆ (Ph. L. E. & D.), L.
Ph. L.) Woody nightshade or bitter
new shoots), 10 drs.; water, 1½
to a pint, and strain.
E.) Dulcamara (*chopped small*),
ing, 1 *oz.; boil to a pint, and*

3. (Ph. D.) Twigs of woody nightshade, 1 oz.; water, 1 pint; boil 10 minutes in a covered vessel, and strain. It should measure about 16 fl. oz. Alterative, diaphoretic, and diuretic.—*Dose.* A wine-glassful, or more, 2 or 3 times a day; in chronic coughs and chronic skin diseases, and in most of those cases wherein sarsaparilla proves useful. See DECOCTION OF BITTER SWEET, also *below.*

Decoction of Dulcama''ra (Compound). *Syn.* DECOCTUM DULCAMA''RÆ COMPOS'ITUM, L. *Prep.* 1. (Augustin.) Dulcamara (bitter sweet), 4 drs.; burdock root, liquorice root, sassafras chips, and guaiacum wood, of each, 2 drs.; water, 2 lbs.; boil to 16 fl. oz., and strain.—*Dose.* 1 to 2 wine-glassfuls, 2 or 3 times a day.

2. (Foy.) As the last, but using dulcamara, 2 oz.—*Dose.* ½ to 1 wine-glassful; in similar cases to those in which the simple decoction is given; especially in chronic rheumatism and venereal affections.

Decoction of El'der Bark. *Syn.* DECOCTUM SAMBU''CI, D. S. CORTICIS, L. *Prep.* 1. (Sydenham.) Inner bark of elder, 1 oz.; water and milk, of each, 1 pint; boil to one half, and strain.

2. (Collier.) Bark, 1 oz.; water, 16 fl. oz.; boil to ½ pint, and strain.

3. (Pereira.) Bark, 1 oz.; water, 1 quart; boil to one half.—*Dose.* One wine-glassful 2 or 3 times a day; as an aperient and resolvent in various chronic disorders, in dropsy, and in certain cutaneous affections; or, 2 wine-glassfuls, as before, as a hydragogue cathartic in dropsies.

Decoction of Elecam'pane. *Syn.* DECOCTUM HELEN''II, D. INU'LÆ, L. *Prep.* (Ph. U. S.) Elecampane root, ½ oz.; water, 1 pint; boil a few minutes, and strain. Tonic and expectorant, and, in some cases, diuretic and diaphoretic.—*Dose.* A wine-glassful every hour or two. (See *below.*)

Decoction of Elecampane (Compound). *Syn.* DECOCTUM HELENII COMPOSITUM, D. INULÆ C., L. *Prep.* (Rotier.) Elecampane, 1 oz.; hyssop and ground ivy, of each, 2 drs.; water, 1 pint; boil 15 minutes, strain, and add of honey, 2 oz.—*Dose.* 1 to 3 table-spoonfuls; as the last.

Decoction of Elm Bark. *Syn.* DECOCTUM UL'MI (B. P.), L. *Prep.* Elm bark (cut in small pieces), 1 oz.; distilled water, 16 oz.; boil to 8 oz., and strain.—*Dose.* 2 to 4 oz., three or four times a day, as a cheap substitute for sarsaparilla in scaly skin diseases. (See *below.*)

Decoction of Elm Bark (Compound). *Syn.* DECOCTUM ULMI COMPOSITUM, L. *Prep.* (Jeffrey). Simple decoction of elm bark, 8 pints; liquorice root, sassafras, and guaiacum chips, of each, 1 oz.; mezereon root, 3 drs.; boil for one hour, and strain. More active than the last.

Decoction of Er'got. *Syn.* DECOCTUM ERGOT'Æ, *D. SECA'LIS CORNU'TI*, L. *Prep.* (*Pereira.*) Ergot of rye (bruised), 1 dr.; water, 6 fl. oz.; boil 10 minutes, and strain.—*Dose.* One third, at intervals of half an hour, until the whole is taken; as a parturifacient.

Decoction of Fern Root. *Syn.* DECOCTUM FILI'CIS; D. RADICIS F., L. *Prep.* (Dr. Wood.) Dried fern-root, 1 oz.; water, 1 pint; boil to 16 fl. oz., and strain. By wine-glassfuls, fasting, until it excites slight nausea; as a vermifuge, more particularly for tapeworm.

Decoction of Figs. *Syn.* DECOCTUM FICI, L. *Prep.* (Cadet.) Figs (chopped), 1 oz.; water, 1 pint; boil, and strain. Demulcent and pectoral; taken *ad libitum.* (See *below.*)

Decoction of Figs (Compound). *Syn.* DECOCTUM FICI COMPOSITUM, L. *Prep.* (Foy.) Figs and raisins (chopped), of each, 2 oz.; liquorice root, ½ oz.; boiling water, 1 quart; boil 15 minutes, and strain. As the last.

Decoction for Ene'mas. *Syn.* DECOCTUM PRO ENEMA'TE, L. Barley-water, or thin gruel, is commonly used under this name. See DECOCTION OF MALLOWS, &c.

Decoction for Fomenta'tions. *Syn.* DECOCTUM PRO FOMENTO, L. *Prep.* (Ph. L. 1788.) Dried leaves of southernwood, tops of sea wormwood, and chamomile flowers, of each, 1 oz.; laurel or bay leaves (dried), ½ oz.; water, 1 pint, boil a few minutes, and strain.

Decoction of Galls. *Syn.* DECOCTUM GAL'LÆ, (Ph. L.) *Prep.* From galls (bruised), 2½ oz.; water, 1 quart; boiled to one half, and strained. As an astringent, fomentation, enema, or injection, in prolapsus ani, piles, and leucorrhœa.

Decoction of Guaiac'um. *Syn.* DECOCTUM GUAIAC'I (Ph. E.), D. G. COMPOSITUM (Ph. D. 1826), L. *Prep.* 1. (Ph. E.) Guaiacum shavings, 3 oz.; raisins (chopped), 2 oz.; water, 8 pints; simmer down to 5 pints, adding towards the end, sassafras (rasped or sliced), and liquorice root (bruised), of each, 1 oz.

2. (Ph. D.) Guaiacum wood, 3 oz.; sassafras, 10 drs.; liquorice root, 2½ oz.; water, 10 pints; as the last; to strain 5 pints.

Obs. The above form the once celebrated 'Decoction of the Woods.'—*Dose.* A teacupful, 3 or 4 times daily, or oftener, in chronic rheumatism, cutaneous diseases, after a course of mercury, &c. Although its virtues are of a very dubious kind, there is no doubt that it frequently does good, especially when persevered in with a sudorific regimen.

Decoction of Hairy Horehound. *Syn.* DECOCTUM BALLOTÆ LANATÆ, L. *Prep.* (Rehmann.) Siberian or woolly horehound (Ballota), 1½ oz.; water, 1 quart; boil to one half.—*Dose.* A tumblerful, or more, twice a day; in rheumatic, gouty, and dropsical affections, especially the latter. See DECOCTION OF HOREHOUND.

Decoction of Harts'horn. See MIXTURES.

Decoction of Hel'lebore. 1. (DECOCTION OF BLACK HELLEBORE; DECOCTUM HELLEBORI NIGRI, L.) *Prep.* 1. (A. T. Thomson.) Black hellebore root, 2 drs.; water, 1 pint; boil 15 minutes.—*Dose.* 1 fl. oz., every 4 hours; in

dropsy, worms, chronic skin di
ring in non-irritable habits.

2. (DECOCTION OF WHITE I
COCTUM VERATRI, Ph. L. & D.
1836.) White hellebore (b
water, 1 quart; boil to a pint
add of rectified spirit, 3 fl. oz.
in itch, lepra, psoriasis, scald-
destroy pediculi. In most c
diluted with water, and should
to the unsound skin.

Decoction of Horehound.
DECOCTION OF HOREHOUND;
RUBII COMPOSITUM, L. *P*
Griffith.) Dried horehound
gare), 1 oz.; liquorice roo
(bruised), of each, ½ oz.; b
pint; macerate for 3 or 4 hour
and strain. An excellent de
toral.—*Dose.* 1 to 2 fl. oz.,
coughs, &c.

Decoction of Horse-chest'n
DECOCTUM HIPPOCASTANEI,
Wood.) Horse-chestnut bark
dered), 10 drs.; water, 1 pint;
and strain. *Used* for decoct
bark. A little liquorice ro
added. (See *below.*)

Decoction of Horse-chestnut B
Syn. DECOCTUM HIPPOCASTAN
L. *Prep.* 1. (Phœbus.) Hors
1½ oz.; water, 18 fl. oz.; b
strain, and when quite cold, a
ether, 1 to 2 drs.; syrup of or
To be used during the intermi
in wine-glassfuls at a time.

2. (Spielman.) Horse-che
willow bark, of each, ½ oz.;
ticus and root of water avens,
water, 16 fl. oz.; boil to one
last.

Decoction of Iceland Moss.
OF LIVERWORT; DECOCTUM CE
D. LICHENIS ISLANDICI (Ph. D.
(Ph. L. 1824). *Prep.* 1. (Ph
(Iceland moss), 5 drs.; water,
a pint, and strain.

2. (Ph. D.) Iceland moss,
1½ pint; boil for 10 minute
vessel, and strain. Nutritic
pectoral, and tonic.—*Dose.* 1 t
3 or 4 hours; in chronic affecti
and stomach, especially pulm
tion, old coughs, dyspepsia, ch
and dysentery. It may be
sweetened; milk is frequentl
The bitter matter may be remo
the moss for some time in pret
or in cold water to which a
bonate of potash has been
out this is done, it is intens
nauseous.

Decoction of Indian Ba'el. *S*
OF ÆGLE MARMELOS; DECOC
From the dried unripe fruit of
(Indian bael), 2 oz.; water, 1

2 fl. oz. two or
sentery, diarrhœa,

. *Syn.* DECOCTUM
ıdian pink root, 5
minutes; add senna,
, strain, and add of
small teacupful, 3
lt; ½ oz. to 1 oz., or
ılthelmintic purge.

aparil'la. *Syn.* DE-
L. *Prep.* (Pereira.)
illa (*Hemedesmus In-*
pint; boil to a pint.
ad tonic.—*Dose.* By
tion of sarsaparilla.

oss. *Syn.* DECOCTUM
ereira.) Carrageen or
erate in lukewarm water
t out and drain it, and
or milk), 3 pints, for 15
hrough linen.

above weight of moss is
ge (*mucilago chondri*) is
y be flavoured with lemon
ıd forms a most nutritious
t. It is taken in the same
of Iceland moss; and is fre-
in cookery, as a substitute
n the preparation of blanc-

singlass. See LISBON DIET

Ju''niper Berries (Compound).
JUNIPERI COMPOSITUM, L.
Hosp.) Juniper berries 2 oz.;
, 3 drs.; water, 4 pints; boil
in, and add compound spirit of
oz. Diuretic.—*Dose.* 2 or 3
3 times a day, warm.

Lin'seed (Compound). *Syn.*
COMPOS'ITUM (Ph. D.), L.
) Linseed, 1 oz.; liquorice root
; water, 1½ pint; boil for 10
vered vessel, and strain whilst
nt and demulcent.—*Dose.* A
ad libitum; in gonorrhœa, dys-
ary affections, &c. It may be
h lemon peel, and sweetened.

Liq'uorice. *Syn.* DECOCTUM
, L. *Prep.* (Ph. D. 1826.)
(sliced), 1½ oz.; water, 16 fl.
inutes and strain. A mild de-
taken either alone, by wine-
used as a vehicle for more ac-

isbon. See LISBON DIET

Liv'erwort. See DECOCTION

Log'wood. *Syn.* DECOCTUM
(Ph. L. E. & D.), L. *Prep.* 1.
wood chips, 10 drs.; water, 1½
pint, and strain.
wood, 1 oz.; water, 1 pint; boil to 10 fl. oz., adding towards the last, cinnamon (in powder), 1 dr.

3. (Ph. D.) Logwood, 1 oz.; water, ½ pint. Astringent and tonic.—*Dose.* 1 table-spoonful to a wine-glassful; in diarrhœa, as required.

Decoction of Mad'der. *Syn.* DECOCTUM RUBIÆ, D. R. TINCTORIÆ, L. *Prep.* 1. (Dewees.) Powdered madder, 1 oz.; boiling water, 1 pint; simmer for 15 minutes, and add of cloves (bruised), 1 dr.; when cold, strain.—*Dose.* A wine-glassful, 2 or 3 times daily; in amenorrhœa, chlorosis, &c.; or every 3 hours, a short time previous to the expected menstrual discharge.

2. (W. Cooley.) To the last add ammonio-citrate of iron, 3 drs.

3. (St. Marie.) Powdered madder, ½ oz.; hops, 1 dr.; English walnut leaves, 3 drs.; water, 1 quart; boil to 1½ pint, strain, and when cold, add of tincture of tartrate of iron, 1 dr.—*Dose.* 2 fl. oz., night and morning; in scrofula, &c.

Decoction of Mal'lows. *Syn.* COMMON DECOCTION; DECOCTUM COM'MUNE, D. PRO ENEMA'TE (Ph. L. 1787), D. MALVÆ COMPOSITUM (Ph. L. 1836), L. *Prep.* (Ph. L. 1836.) Common mallows (dried), 1 oz.; chamomile flowers (dried), ½ oz.; water, 1 pint; boil 15 minutes, and strain. *Used* chiefly for fomentations and enemas.

Decoction of Malt. *Syn.* DECOCTUM BY'NÆ, D. BYNES, D. MALTI, L. *Prep.* (Swediaur.) Ground malt, 3 oz.; water, 1 quart; boil to a pint, and strain. An oz. of syrup of lemons, or of saffron, may be added to the cold decoction; or, a little liquorice root, with the malt. Demulcent and laxative. A cupful *ad libitum.* Infusion of malt (sweet wort) is a more convenient and elegant preparation.

Decoction of Marshmal'low. *Syn.* DECOCTUM ALTHÆ'Æ (Ph. D. 1826 and Ph. E. 1813), L. *Prep.* (Ph. D. 1826.) Dried root and herb of marshmallow, 4 oz.; raisins (stoned), 2 oz.; water, 7 pints (wine measure); boil down to 5 pints, strain, allow it to deposit the sediment and decant the clear liquid. Demulcent.—*Dose.* A cupful *ad libitum,* in coughs, colds, calculous affections, and other diseases of the urinary organs. See MIXTURES.

Decoction of Mat'ico. *Syn.* DECOCTUM MATICO'NIS, L. *Prep.* (Dr. Jeffreys.) Matico leaves, 1 oz.; water, 1 pint; boil 12 minutes, and strain. Astringent.—*Dose.* 1 fl. oz., 2 or 3 times a day; in hæmorrhagic and other discharges.

Decoction, Mercu''rial. *Syn.* DECOCTUM HYDRARGYRI, D. MERCURIALE, L. *Prep.* 1. Quicksilver, 4 oz.; water, 1 pint; boil in a glass or earthen vessel for an hour, adding water to replace that lost by evaporation.—*Dose.* A teacupful.

2. Mercurial pill, 1 oz.; water, 1 quart; boil to a pint.—*Dose.* A wine-glassful. Both were formerly taken for worms and the itch.

3. Corrosive sublimate, 1 gr.; (dissolved in)

spirit of wine, 80 drops; extract of sarsaparilla, 3 drs.; decoction of sarsaparilla, 8 fl. oz.; mix.—*Dose*. One large table-spoonful, 3 times a day; in syphilis and obstinate skin diseases.

Decoction of Mezere'on. *Syn.* DECOCTUM MEZEREI (Ph. E. and Ph. D. 1826), L. *Prep.* (Ph. E.) Root-bark of mezereon, 2 drs.; liquorice root, 4 drs.; water, 1 quart; simmer to 1½ pint, and strain. Stimulant and sudorific.—*Dose*. A wine-glassful, or more, three or four times a day; in chronic rheumatism, scrofula, secondary syphilis, lepra, and some other cutaneous affections. Much boiling injures the virtues of mezereon. (See *below*.)

Decoction of Mezere'on (Compound). *Syn.* DECOCTUM MEZEREI COMPOSITUM, L. *Prep.* (Van Mons.) Mezereon, 2 drs.; bitter sweet, 4 drs.; burdock, 2 oz.; water, 2 quarts; boil to 3 pints, add of liquorice root, 2 drs., and strain. As the last, and in obstinate diseases of the skin.

Decoction, Narcotic. *Syn.* DECOCTUM ANODYNUM, D. NARCOTICUM, L. *Prep.* (Hosp. Form.) Common nightshade (dried), 1 oz.; poppy heads, 3 in no.; water, 1 pint; boil 10 minutes, and strain. As an anodyne fomentation, used warm.

Decoction of Ni'tre. *Syn.* DECOCTUM NITROSUM, D. NITRATUM, D. POTASSÆ NITRATIS, L. *Prep.* 1. Nitre, ½ oz.; white sugar, 2 oz.; cochineal, 20 grs.; water, 1½ pint; boil a few minutes, and strain.

2. (Hosp. Form.) Barley-water, 1 pint; nitre, 5 drs.; dissolve. Diuretic, diaphoretic, and refrigerant. A wine-glassful, frequently; in gonorrhœa, sore throat, acute rheumatism, scurvy, &c.

Decoction of Oak Bark. *Syn.* DECOCTUM QUERCÛS (Ph. L. E. & D.), L. *Prep.* 1. (Ph. L. & E.) Oak bark (bruised), 10 drs.; water, 1 quart; boil down to a pint, and strain.

2. (Ph. D.) Oak bark, 1½ oz.; water, 1½ pint; boil 10 minutes, and strain. Astringent. *Used* as a gargle in ulcerated sore throat, relaxation of the uvula, &c., and as a wash, and as an injection in piles, leucorrhœa, hæmorrhages, prolapsus ani, &c.

Decoction of Oats. *Syn.* WATER GRUEL; DECOCTUM AVENÆ, L. *Prep.* 1. (Cullen.) Oatmeal, 1 oz.; water, 3 quarts; boil to a quart, strain, and when cold, decant the clear liquid from the sediment.

2. (A. T. Thomson.) Washed groats, 4 oz.; water, 4 pints; boil to a quart. Nutritious and demulcent. Taken *ad libitum*, to promote the action of purgatives, and as an enema, either alone, or as a vehicle for more active substances. It is too thin for food. See GRUEL.

Decoction of Parei'ra. *Syn.* DECOCTUM PAREIRÆ (Ph. L.), L. *Prep.* 1. (Ph. L.) *Pareira brava* root (sliced), 10 drs.; water, 1½ pint; boil to a pint, and strain.

2. (Sir B. Brodie.) Pareira, 4 drs.; water, 3 pints; boil to a pint, as last. Th
given in gonorrhœa, leucorrhœa,
inflammation of the bladder.—*Dos*
first, ½ to 1 wine-glassful, 3 or 4
of the second, about twice that
more. It is commonly combined
tincture of hyoscyamus; and whe
phosphates are present in the
hydrochloric or nitric acid may be
PAREIRA.

Decoction, Pec'toral. See DECO
BARLEY.

Decoction of Pel'litory. DECOCTU
THRI, L. *Prep.* (Guy's Hosp.) Pel
1 oz.; water, 1½ pint; boil to a
strain. *Used* as a gastric stimulant,
gargle in the relaxation of the uvula.

Decoction of Pome'granate. *Syn.*
TUM GRANA'TI (Ph. L.), L. *Prep.*
Pomegranate rind (fruit-bark), 2 oz.;
water, 1½ pint; boil to a pint, and
Astringent. *Used* as a gargle and inj
sore throat, leucorrhœa, &c.; and in
in diarrhœa, dysentery, &c.—*Dose.*
or more.

Decoction of Pomegranate Root.
COCTUM GRANATI RADICIS (Ph. L.), L.
1. (Ph. L.) Root-bark of pomegranate
2 oz.; water, 1 quart; boil to a pi
strain.

2. (Collier.) Bark of the root, 2 oz.;
1 pint; boil to one half. This is the
form used in India.

Dose, *&c.* A wine-glassful, half
until the whole is taken, a light di
dose of castor oil having been taken
previously. In tapeworm, Dr. Collier
mends the whole of the last preparatio
given at 2 doses, at the interval of
It purges, and in 5 or 6 hours freque
pels the worm; if this does not take
should be persevered in. "Look for
of the tænia (tapeworm); for if th
expelled, you have done nothing."
Oil of turpentine and kousso are
frequently given in tænia in this cou

Decoction of Pop'pies. *Syn.* DEC
POPPY-HEADS, FOMENTATION OF P
COCTUM PAPAVERIS (Ph. L. E. &
Prep. 1. (Ph. L.) Poppy-heads (
oz.; water, 2 quarts; boil for 15 mi
strain.

2. (Ph. E. & D.) As the last, but
3 pints of water. *Used* as an emolli
tation, in painful swellings, excori
The addition of a ¼ pint of vinegar
promote its efficacy.

Decoction of Quas'sia. *Syn.* D
QUASSIÆ, L. *Prep.* From quassia chi
1 dr.; water, 1¼ pint; boil to a pint
syrup of orange peel, 2 oz.—*Dose.*
glassful, occasionally, as a stomach
See INFUSIONS.

Decoction of Quince. *Syn.* DECO
QUINCE SEED, MUCILAGE OF Q. S.; D
CYDONII (Ph. L.), L. Prep. From q

boil for 10 minutes, and
mollient and sheathing
or wounded surfaces, as
&c.; and to the skin in
. hæmorrhoidal tumours,
ared with a little less
he hairdresser as 'bando-

Syn. RICE WATER, RICE
ORY'ZÆ, L. *Prep*. Rice,
art; boil to one half, and
t. A good drink in fevers,
r alone or sweetened and
ttle lemon peel.
saparil'la. *Syn*. DECOCTUM
E.), D. SARSAPARILLÆ (Ph.
(Ph. L.) Sarsaparilla (sliced),
quarts; boil to a quart, and

Sarsaparilla, 5 oz.; boiling dis-
pints; macerate for 2 hours, in
y covered, and placed in a warm
n take out the root, bruise it,
in to the liquor, boil down to a
rain.
D.) Sarsaparilla, 2 oz.; boiling
nt; digest an hour, boil 10 minutes,
rain.
e medicinal virtues of sarsaparilla
e wholly in the bark, or cortical por-
is therefore quite unnecessary to bruise
ected in the Ph. E. By those houses
largely in decoction of sarsaparilla,
is seldom split or cut; the bundles in
it is made up being simply untied and
open, to allow of the free exposure of
part to the solvent action of the water.
plan the whole of the soluble portion
bark is extracted, whilst the feculent
that pervades the wood is only partially
out. According to Soubeiran, a mere
is preferable. The *dose* is a teacupful
a pint, 3 or 4 times a day.
extemporaneous decoction of sarsaparilla
by dissolving ¾ oz. of the simple extract
1 pint of hot water. See SARSAPARILLA,
below.
ecoction of Sarsaparilla (Concentrated).
DECOCTUM SARZÆ CONCENTRATUM, L.
1. (Wholesale.) Sarsaparilla (Jamaica),
lbs., is placed in a large and well-cleaned
per boiler, and enough boiling water added
cover it; it is then left to macerate, without
ing, for 3 or 4 hours, after which it is
ed for about an hour, and the clear liquor
wn off into another clean copper pan; the
t (after it has well drained) is then washed
'sparged'[1] with boiling water, until the
er runs off scarcely coloured; the washings
added to the decoction, and the whole
porated as quickly as possible to 6½ pints;
is then set to cool, and rectified spirit of
, 1½ pint, further added; after agitation,
whole is set aside in a well-corked bottle,
in a cool place, for a week. In a few days it is usually found as clear and brilliant as brandy, with very little sediment, and will keep for any length of time uninjured. Some manufacturers, instead of washing the root, give it a second and third water, boiling it each time and evaporating the mixed liquors.

2. (Extemporaneous.) Extract of sarsaparilla, 6¼ oz.; water, 12 fl. oz.; dissolve, add rectified spirit, 2½ fl. oz., and water, q. s. to make the whole exactly measure a pint.

Obs. 1 drachm of this decoction, mixed with 7 drachms of water, forms a similar preparation to the Decoctum Sarzæ of the Ph. L., and is now very frequently substituted for it in dispensing. See SARSAPARILLA, EXTRACTS, and *below*.

Decoction of Sarsaparilla (Compound). *Syn*. DECOCTUM SARZÆ COMPOSITUM (Ph. L. & E.), D. SARSAPARILLÆ C. (Ph. D.), L. *Prep*. 1. (Ph. L.) Decoction of sarsaparilla (boiling), 4 pints; sassafras chips, guaiacum wood (rasped), and fresh liquorice root (bruised), of each 10 drs.; mezereon (root-bark), 3 drs.; boil for 15 minutes, and strain.

2. (Ph. E.) As the last, but using 4 drs. of mezereon.

3. (Ph. D.) Sarsaparilla (sliced), 2 oz.; sassafras, guaiacum turnings, and liquorice root (bruised), of each, 2 dr.; mezereon root-bark, 1 dr.; boiling water, 1¼ pint; digest for an hour, then boil for 10 minutes, cool, and strain.

4. (Extemporaneous.) Compound extract of sarsaparilla, 7½ drs.; boiling water, 1 pint; dissolve.

Obs. This decoction is an imitation of the once justly celebrated 'Lisbon Diet Drink.' It is alterative and diaphoretic.—*Dose*. A teacupful, or more, 3 or 4 times a day, either along with, or after, a mercurial course; and in syphilis, scurvy, scrofula, chronic rheumatism, lepra, psoriasis, and several other skin diseases, and especially in cachexia, or general bad habit of body. During its use the skin should be kept warm. See SARSAPARILLA and *below*.

Decoction of Sarsaparilla (Concentrated Compound). *Syn*. DECOCTUM SARZÆ COMPOSITUM CONCENTRATUM, D. SARSAPARILLÆ C. C., L. There is a very considerable trade done in this article, in consequence of compound decoction of sarsaparilla being taken in large doses, both alone and in combination with other remedies, and the pharmacopœial preparation spoiling if kept longer than about 12 hours, in warm weather. Like the concentrated simple decoction, it is said to be of 8 times the usual strength, so that when mixed with 7 times its weight of water, it forms a similar preparation to the Decoctum Sarzæ Compositum,—Ph. L.; for which it is very generally substituted in dispensing.

Prep. 1. (Wholesale.) Sarsaparilla (red Jamaica), *96 lbs.; mezereon root* (not root-bark), *9 lbs.; liquorice root* (bruised), 16 lbs. The me-

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[1] explanation of the operation of 'sparging' see

zereon and liquorice are first laid (loosely) on the bottom of a clean copper pan, and the bundles of sarsaparilla (untied and loosened) packed over them, in horizontal layers, alternately at right angles with each other. Three or four boards, with as many iron ¼-cwt. weights, are next placed on the top of the whole. Water is now run in, to about ten inches higher than the ingredients, and heat is applied until ebullition commences. The materials are now allowed to macerate, without boiling, for 3 or 4 hours, after which the liquor is gently boiled for about an hour, care being taken to add fresh water from time to time, so as to keep the whole well covered. The decoction is next run off, and set evaporating as quickly as possible. The ingredients are then washed with successive portions of boiling water, by allowing it to descend from a species of shower-bath, after the manner of 'sparging,' described under BREWING.[1] This is repeated until the water runs off nearly colourless, the smallest quantity being employed that will effect the object in view. The whole of the liquid is now evaporated without delay, until reduced to 8½ galls., when, after cooling, 2 drs. of essential oil of sassafras, dissolved in 2 galls. of rectified spirit of wine, are added, and afterwards, 1 pint of essence of guaiacum. The liquid is then placed in a suitably sized barrel, set upon its head, and fitted with a small cock (not placed too near the bottom), and allowed to repose for a week, by which time it becomes clear and brilliant, and fit for sale. This is the form adopted by the large metropolitan drug-houses most celebrated for this preparation. The product that may be drawn off fit for sale is something over 10 galls. The residuum, forming the 'bottoms,' consists chiefly of fecula. The latter is well stirred up with 3 or 4 galls. of cold water, and allowed to settle. The clear decanted 'washings' are used as water or liquor in making the next batch of decoction.

2. (Extemporaneous.) Compound extract of sarsaparilla, 7½ oz.; boiling water, 12 fl. oz.; dissolve, then add of rectified spirit of wine, 2½ fl. oz.; mix well, and further add of water, q. s. to make the whole measure a pint.

Obs. To conduct this process successfully, several large copper pans are required; one of which (to boil the ingredients in) must be capable of containing from 140 to 150 gallons at the least, and the others must be sufficiently large to receive the liquors as they are drawn off. Those for the evaporation should be very shallow, in order that it may proceed rapidly; and the whole should be heated by steam. An excellent plan is, to employ large wooden vats, and to apply the heat by means of pipes laid along the bottom, and supplied with high-pressure steam. This method is less expensive than the use of double steam pans, as above. When essence of guaiacum is not used, 24 lbs. of guaiacum shavings, from which the dust has
been sifted, are boiled with th
dients, instead. Those desirous
proportions of the ingredients o
Colleges, may do so by taking ei
given quantities, and proceeding
following are special preparatio

FELTZ'S DECOCTION OF SARSA
AP'OZEM OF FELTZ; DECOCTU
ICHTHYOCOL'LÂ, L.; PTISANE I
Prep. From sarsaparilla (sliced
glass and crude antimony (in po
½ oz.; water, 5 pints; boil to
strain. *Used* in skin diseases.

JAUPERAND'S DECOCTION OF S
Syn. DECOCTUM SARZÆ CUM RAD
PTISANE DE JAUPERAND, Fr.
Sarsaparilla and China root, of
senna and sassafras chips, of eac
barb and Peruvian bark, of ea
bonate of potassa, 1 dr.; water,
mer, gently, for several hours,
pints; when cold, decant the
2 fl. oz., two or three times daily
&c.

VINACHE'S DECOCTION OF S
Syn. DECOCTUM SARZÆ CUM SEN
SANE DE VINACHE, Fr. *Prep.* (
parilla, China wood, and guaia
each, 1½ oz.; crude antimony (t
2 oz.; water, 6 pints; macerate
(7 in hot weather), boil to c
sassafras chips and senna, of ea
fuse 1 hour longer, and strain
decant the clear. Recommende
secondary syphilis, and variou
affections.

ZITTMANN'S DECOCTION OF S.
Syn. DECOCTUM ZITTMANNI, L.
ZITTMANN, Fr. *Prep.* 1. (STRO
TION; D. Z. FORTE, Ph. Bor. 1
parilla, 12 oz.; water, 72 lbs. (s
digest 24 hours, then add (suspe
white sugar and alum, of each, 6
4 drs.; cinnabar, 1 dr.; boil to
towards the end of the process,
liquorice root, 1½ oz.; aniseed an
of each, ½ oz.; finally strain, with
after some time decant the clear
formula in the 'Ph. Suec.' 18
that in the 'Hamburg Codex'
24 lbs. of water to be used, and
be reduced to 16 lbs.

2. (WEAKER DECOCTION; D.
Ph. Bor. 1847.) Add to the res
of the last preparation, sarsa
water, 72 lbs. (say, 5¾ galls.);
adding towards the end of the
peel, cinnamon bark, liquorice ro
moms (all bruised), of each, 3 drs.
&c., as before. In the 'Ph. Suec
the above weights of lemon peel
root are ordered; and in the 'Ha
(1845) 24 lbs. of water only are
the whole is to be boiled down to

Obs. Both the above are use
and on the Continent generally

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[1] See page 262.

which compound decoction of ministered in England. They most *ad libitum*. A trace of e detected in the stronger properly prepared. See SAR-

ea'ega Root. *Syn.* DECOCTION SNAKE ROOT, D. OF RATTLE- ECOCTUM POLYGALÆ, D. SE- L. *Prep.* (Ph. L.) Senega or drs.; water, 1 quart; boil to a .—*Dose.* ½ to 2 wine-glassfuls, nes daily; in humoral asthma, dropsy, &c. It is stimulant, nd diuretic, and, in large and cathartic. It is fre- ed with ammonia. It is the oyed by the Senega Indians ite of the rattlesnake. (Dr.

Simaru'ba Bark. *Syn.* DECOC- BÆ, L. *Prep.* (Dr. Wright.) k, 2 drs.; water, 24 fl. oz.; boil d strain. Tonic.—*Dose.* 1 to 2 onic dysentery and diarrhœa.

f Squills (Compound). *Syn.* DE- LÆ COMPOSITUM, L. *Prep.* (Ph. Squills, 3 drs.; juniper berries, root, 3 oz.; water, 4 lbs.; boil to ain, and add of sweet spirits of . In chronic coughs and other ions, unaccompanied with active y symptoms.—*Dose.* 1 to 3 fl. oz., ice daily.

of Starch. *Syn.* DECOCTUM AM'YLI UCILA'GO AM'YLI (Ph. E. & D.), (Ph. L. & E.) Starch, ½ oz.; add, ater, 1 pint, and boil for a short e Dublin preparation is nearly trong. *Used* as an enema in diarrhœa, and excoriations of the

, Sudorif'ic. *Syn.* DECOCTUM SU- , L. The old name of the com- tions of sarsaparilla and guaiacum.

of Su'et. *Syn.* ARTIFICIAL GOAT'S OCTUM SE'VI, L. *Prep.* Suet, 1 loosely in a piece of muslin and n cow's milk, 1½ pint; adding ast, white sugar, ½ oz. In scrofu- tion and phthisis; taken *ad*

of Tam'arinds. *Syn.* DECOCTUM UM, L. *Prep.* Tamarinds, 1½ l pint; boil for 5 minutes, and leasant drink in fevers, asthma, s, &c.

of Tamarinds and Sen'na. *Syn.* INDORUM CUM SENNÂ (Ph. E. *rep.* Tamarinds, 6 drs.; cream of ; water, 1½ pint; boil in a glazed el until reduced to 16 oz.; then in for 12 hours, senna, 4 drs.; dd of syrup of violets, 1 oz. A ant.—*Dose.* A *wine-glassful, or*

Decoction of Tar. *Syn.* TAR WATER; DECOCTUM PI'CIS LIQ'UIDÆ, L. *Prep.* Tar, 1 oz.; water, 1½ pint; boil to 1 pint.—*Dose.* A pint, or more, daily; in chronic catarrh; and as a wash in chronic skin diseases, especially those of the head, in children.

Decoction, Ton'ic. *Syn.* STRENGTHENING DECOCTION; DECOCTUM ROBORANS, L. *Prep.* 1. Peruvian bark (bruised), ½ oz.; Virginian snake root, 2 drs.; water, 1 pint; boil to one half, strain whilst hot, and add, spirit of cinnamon, 1½ fl. oz.; diluted sulphuric acid, 1½ dr.—*Dose.* 2 oz., two or three times a day.

2. Decoction of bark, 5 oz.; tincture of bark, 6 drs.; aromatic confection, ½ dr.; sal-volatile, 1 dr.—*Dose.* 1 or 2 table-spoonfuls night and morning; especially in diarrhœa.

Decoction of Tor'mentil. *Syn.* DECOCTUM TORMENTIL'LÆ (Ph. L.), L. *Prep.* (Ph. L.) Tormentil root (bruised), 2 oz.; water, 1½ pint; boil to a pint, and strain. Astringent. —*Dose.* 1 to 2 fl. oz., in chronic diarrhœa, &c.

Decoction of Tur'meric. *Syn.* DECOCTUM CURCU'MÆ, L. *Prep.* From turmeric root (in powder), 1½ oz.; water, 1 pint; boil for 5 minutes, and strain. A mild aromatic stimulant and stomachic.—*Dose.* A wine-glassful, *ad libitum*. It is principally used as a test for alkalies, which turn it brown. Unsized paper dipped into it and dried forms the turmeric test-paper of the chemist.

Decoction of Verbe'na. *Syn.* DECOCTUM VERBE'NÆ, L. From verbena (vervain), 2 oz.; water, 1½ pint; boil to 1 pint, and strain.

Obs. The *Verbena officinalis* was formerly highly recommended by Etmuller, Hartman, De Haën, Morley, and others, in scrofula, cephalalgia, &c., but afterwards fell into neglect. More recently, a decoction of the plant has been highly extolled by Boshanov, and others, as an anti-febrile.

Decoction, Vul'nerary. *Syn.* DECOCTUM VULNERA''RIUM, L. *Prep.* From ground ivy and broad-leaved plantain, of each, ½ oz.; water, 3 pints; boil to 1 quart, strain, and add sugar, 1 oz. A popular pectoral and tonic, especially in old coughs; also to heal wounds.—*Dose.* ½ a teacupful or more, twice a day.

Decoction of Wal'nut Bark. *Syn.* DECOCTUM JUGLAND'IS, L. *Prep.* (Ph. Gen.) Green bark of walnuts, 1 oz.; water, 1 pint; boil for 15 minutes, and strain. As an anti-syphilitic. Before the general introduction of sarsaparilla, it was much esteemed in most cases in which that drug is now taken.—*Dose, &c.* The same as those of comp. dec. of sarsaparilla. Pearson says, that "when the putamen (green rind) of the walnut has been omitted, either intentionally or by accident (from Decoctum Lusitanicum), the same good effects have not followed its use as when it contained this ingredient.

Decoction of Walnut Leaves. *Syn.* DECOCTUM JUGLAND'IS FOLIO''RUM, L. *Prep.* (Negrier.) Walnut leaves, 1 handful; water, 1 quart; boil 15 minutes, and strain. Detersive, diaphoretic, and alterative.—*Dose, &c.* As the last, especially in chronic rheumatism, secondary syphilis, &c.

Decoction of Wa'terdock. *Syn.* DECOCTUM RUMI'CIS, D. R. AQUAT'ICI, L. *Prep.* (A. T. Thomson.) Root of common waterdock (*Rumex obtusifolius*), 1 oz.; water, 1 pint; boil for 10 minutes, and strain.

Obs. This decoction is astringent, and was once much celebrated as a remedy for scurvy and some other cutaneous affections. "It is the only remedy which proves efficacious in that disease, when the ulcers are healed, and the patient is attacked with asthma." (Linnæus, on the scurvy of the Laplanders.)

White Decoction (Sydenham's). *Syn.* HARTSHORN DRINK; MIS'TURA COR'NU USTI. *Prep.* Prepared burnt hartshorn, 2 oz.; gum arabic, 1 oz.; water, 3 pints; boil to 1 quart, and strain. Mucilaginous; demulcent. Taken *ad libitum.*

Decoction of Whor'tleberry. *Syn.* DECOCTION OF BEAR-BERRY, D. OF UVA-URSI; DECOCTUM UVÆ URSI (Ph. L. & D.), L. *Prep.* 1. (Ph. L.) Whortleberry leaves, 1 oz.; water, 1½ pint; boil to a pint, and strain.

2. (Ph. D.) Uva-ursi (the leaves), ½ oz.; water, ½ pint; boil 10 minutes, and strain.

Dose, &c. 1 to 3 fl. oz., two or three times daily; in phthisis and purulent affections of the urinary organs, unaccompanied with active inflammation; especially in chronic affections of the bladder.

Decoction of Wil'low Bark. *Syn.* DECOCTUM SALICIS, D. S. CORTICIS, L. *Prep.* 1. (Wilkinson.) Willow bark (*Salix latifolia*), bruised, 1½ oz.; macerate in water, 2 lbs., for 6 hours, then boil for 15 minutes, and strain. Tonic, astringent, and febrifuge.—*Dose.* A wine-glassful.

2. (Nieman.) Willow bark (*Salix alba*), 1½ oz.; water, 2 pint; boil to one half.—*Dose.* 1 to 2 fl. oz. Both are used as substitutes for decoction of cinchona bark.

Decoction of Win'ter-green. *Syn.* DECOCTION OF PYROLA, D. OF UMBELLATED WINTERGREEN, D. OF PIPSISSEWA; DECOCTUM CHIMAPHILÆ (Ph. L.), D. PYROLÆ (Ph. D.), L. *Prep.* 1. (Ph. L.) Chimaphila (dried herb), 1 oz.; water, 1½ pint; boil to a pint, and strain.

2. (Ph. D.) Winter-green (dried leaves), ½ oz.; water, ½ pint; boil 10 minutes in a covered vessel, and strain. Tonic, stomachic, alterative, and diuretic.—*Dose.* 1 to 2 fl. oz.; in dropsies, scrofula, debility, loss of appetite, &c.; and in those affections of the urinary organs in which uva-ursi is commonly given.

Decoction of Worm'seed. *Syn.* DECOCTUM SANTONICI, L. *Prep.* 1. Wormseed, bruised, 2 oz.; water, 1 pint; boil down to 16 fl. oz., and strain.

2. (Dr. R. E. Griffith.) Fresh leaves of wormseed (*Chenopodium anthelminticum,—Linn.*), 1 oz.; water, 1 pint; orange peel, 2
drs.; boil (10 minutes), and
above are bitter, stomachic, and
—*Dose.* A wine-glassful twice
worms. It is also used as an injec
ascarides.

Decoction of Yar'row. *Syn.*
MILLEFOLII, L. *Prep.* From milfo
tops, 1½ oz.; water, 1½ pint; boil
and strain. Astringent, tonic, an
—*Dose.* A wine-glassful, thrice
dropsies, &c. It is also used as a
to bruises, &c.

DECOLORA'TION. The blanch
moval of the natural colour of an
Syrups, and many animal, veg
saline solutions, are decoloured
by agitation with animal charco
sequent subsidence or filtration.
rapidly lose their natural colour
to light, especially to the direct
sun. In this way castor, nut,
several other oils, are whitened.
partially deodorised and decolour
tion through animal charcoal.
linens are still commonly bleach
joint action of light, air, and moi
peculiar way in which light pr
effect has never been satisfactorily
The decoloration of textile fabric
bodies generally is called bleac
BLANCHING, BLEACHING, OILS,
SYRUPS, SUGAR, &c.

DECOMPOSI''TION (-zĭsh'-un).
mistry, the resolution of compound
elements, or the alteration of the
constitution in such a manner tha
ducts are formed.

DEFECA'TION. The separation
from its lees, dregs, or impuriti
sidence and decantation. It is con
ployed for the purification of salin
and glutinous or unctuous liquids,
scale, in preference to filtration;
it is both more expeditious and i
See CLARIFICATION, DECANTATIO
TION, &c.

DEFLAGRA'TION. The sudden
of any substance, for the purpose o
some change in its composition, b
action of heat and oxygen. Th
commonly performed by projecting
hot crucible, in small portions a
mixture of about equal parts of ni
body to be oxidised.

DELIQUES'CENCE. Spontane
tion by absorption of the moistur
mosphere. Deliquescent salts are
by exposure gradually assume the
They should all be kept in well-c
or jars.

DELIR'IUM TRE'MENS. [L.]
ness of drunkards; a disease of t
sulting from the excessive and pr
of intoxicating liquors, particular
spirits. The early *symptoms* a
irritability and fretfulness, w

ody. Sleeplessness and un-
oon follow. At length fright-
sions harass the patient. He
sights, hears extraordinary
rs under all the strange de-
e persons, which, however
ided, operate on him with all
ies till he becomes furiously
most always comes on after
and the hands are usually,
tremulous. A similar affec-
ly produced by the abuse of
mental anxiety, night watch-
1. According to Dr. Arm-
piring the fumes of ardent
ler some circumstances, pro-
e. Persons who have under-
erations under the influence of
more liable to attacks of this
persons.

of delirium tremens consists
licious use of opium, laudanum,
rather large doses, frequently
o 60 drops of laudanum may
hour or two during the fit, its
arefully watched. The object
quiet sleep, from which the
r wakes free from the worst
the disease. Diaphoretics and
may also be given, and a light,
t adopted throughout. Deple-
y bleeding, should be particu-
Alcoholic stimulants and wine,
es, have proved useful. Under
it, the patient, unless of a very
ody, or much debilitated by pre-
s, usually recovers. He is, how-
able to relapses and subsequent
ch are best prevented by judicious
gement.

TIC ACID. *Syn.* Phocenic acid.
l, obtained by saponifying the oil
hins or *porpoise.* According to
riments, it is identical with valeric

ITHE. *Syn.* Del'phine, Del'-
phi'a. An alkaloid discovered by
and Feneulle in *Delphinium staphy-*
lisacre.

l. The husked seeds (in powder) are
little water, and pressed in a cloth;
re magnesia is then added to the
coction, the whole is boiled for a
es, and refiltered; the residuum,
well washed, is digested in boiling
ich dissolves out the alkaloid, and
p again by gentle evaporation and

bruised, but unshelled, seeds are
dilute sulphuric acid, the filtered
ipitated with carbonate of potassa,
precipitate digested in alcohol as

ih.) An alcoholic extract of the
ated with dilute sulphuric acid,
d with an alkali, again dissolved in dilute sulphuric acid; the colouring matter precipitated by a few drops of nitric acid, the alkaloid by potassa. The alkaloid is then dissolved in absolute alcohol, and the solution thus formed is evaporated; one pound yields about one drachm.

Prop., &c. A light-yellowish or white, odourless powder; extremely acrid and bitter; scarcely soluble in water; dissolves in ether, and readily in alcohol; and has an alkaline reaction. Its alcoholic solution produces a burning and tingling sensation when rubbed on the skin, and a similar sensation is produced in various parts of the body when it is taken in doses of a few grains. It has been exhibited in neuralgia and rheumatism by Dr. Turnbull.—*Dose.* $\frac{1}{12}$ gr. every three hours, made into a pill with 1 gr., each, of the extracts of henbane and liquorice. It is also used externally under the form of ointment and lotion.

DEMUL'CENTS. In *medicine*, substances which are calculated to soften and lubricate the parts to which they are applied. Though having the same signification as the word Emollients, it is desirable to restrict the latter term to such as are intended for external application, and to include under the above head only such as are intended for internal exhibition. The principal demulcents are gum arabic, gum tragacanth, liquorice, honey, arrow-root, pearl barley, isinglass, gelatine, milk, almonds, spermaceti, almond and olive oils, and most other mucilaginous, amylaceous, saccharine, and oily substances. For use, these are made into mucilages, decoctions, emulsions, or milks, with water, and form suitable beverages in dysentery, diarrhœa, catarrh, diseases of the urinary organs, and all other diseases where diluents are useful. See Emollients.

DENS'ITY. Comparative masses of equal weights, or the quantity of matter contained in a given space. It is commonly used synonymously with specific gravity, which, however, refers to comparative weights of equal bulks. Thus, quicksilver is said to have a density greater than that of copper, and alcohol one less than that of oil of vitriol.

DENTI'FRICES. *Syn.* Dentifricia, L. Substances applied to the teeth, to cleanse and beautify them. The most useful form of dentifrices is that of powder (tooth powder); but liquids (tooth washes), and electuaries (tooth electuaries, tooth pastes), are also employed. The solid ingredients used in dentifrices should not be so hard or gritty as to injure the enamel of the teeth; nor so soft or adhesive as to adhere to the gums, after rinsing the mouth out with water. Pumice-stone (in fine powder) is one of those substances that acts entirely by mechanical attrition, and is hence an objectionable ingredient in tooth powder intended for daily use. It is, however, very generally present in the various advertised dentifrices, which are remarkable for their rapid action in whitening the teeth. Bath brick is another substance of a similar nature to pumice, and, like that article, should be only occasionally employed. Cuttle-fish bone, coral, and prepared chalk, are also commonly used for the same purpose, but the last is rather too soft and absorbent to form the sole ingredient of a tooth powder. Charcoal, which is so very generally employed as a dentifrice, acts partly mechanically, and partly by its chemical property of destroying foul smells and arresting putrefaction. For this purpose it should be newly burnt, and kept in well-closed vessels, until used, as by exposure to the air it rapidly loses its antiseptic powers. Powdered rhatany, cinchona bark, and catechu, are used as astringents, and are very useful in foulness or sponginess of the gums. Myrrh and mastic are employed on account of their odour, and their presumed preservative action, and power of fixing loose teeth. Insoluble powders have been objected to on account of their being apt to accumulate between the folds of the gums and in the cracks of the teeth, and thus impart a disagreeable appearance to the mouth. To remedy this defect, a reddish or flesh-coloured tinge is commonly given to them with a little rose pink, red coral, or similar colouring substance, when any small portion that remains unwashed off is rendered less conspicuous. Some persons employ soluble substances as tooth powders, which are free from the above objection. Thus, sulphate of potash and cream of tartar are used for this purpose, because of the grittiness of their powders and their slight solubility in water. Phosphate of soda and common salt are also frequently employed as dentifrices, and possess the advantage of being readily removed from the mouth by means of a little water. Among these substances that chemically decolour and remove unpleasant odours, the only ones employed as dentifrices are charcoal and the chlorides of lime and soda. The first has been already noticed; the others may be used by brushing the teeth with water, to which a very little of their solutions has been added. A very weak solution of chloride of lime is commonly employed by smokers to remove the odour and colour imparted by tobacco to the teeth. Electuaries, made of honey and astringent substances, are frequently employed in diseases of the gums. The juice of the common strawberry has been recommended as an elegant natural dentifrice, as it readily dissolves the tartareous incrustations on the teeth, and imparts an agreeable odour to the breath. See Paste and Powder (Tooth), also Washes (Mouth).

DENT'INE. The tissue of which the teeth are composed.

DENTI'TION. See Teething.

DEOB'STRUENT. In medicine, a substance which removes obstructions, and opens the natural passages of the fluids of the body, as *the pores, lacteals,* and glands. Iodine, mercury, sarsaparilla, and aperien
struents.

DEO'DORISER. Any substa
power of destroying fetid efflu
chloride of lime, chloride of
lead, sulphate of iron, and fres
coal, are the most effective
deodorisers. Peat charcoal ha
recommended for deodorising n
the large scale. When it is mi
substances, their fetor is immedi
and a compost produced, whic
stituted for guano for agricult
See Disinfectant.

DEOX'IDATION. See Redu

DEPIL'ATORY. A cosmeti
remove superfluous hairs fro
skin. Depilatories act eithe
(mechanical depilatories),
(chemical depilatories). T
belong adhesive plasters, that, o
from the skin, bring away the h
The second class includes all t
which destroy the hair by
action.

Lime or orpiment, and gen
them, have formed the leading
depilatories, both in ancient
times. The first acts by i
causticity, and also, when an al
by reducing that also, either wh
to the caustic state. The actio
ment is of a less certain charac
is even dangerous when applie
sensitive or an abraded surface.
of starch is to render the paste
and manageable.

In using the following prep
which are in the state of powde
with a little warm water to the
a paste, and applied to the pa
soap lye is used for this pur
persons spread the pulpy mass
paper, and apply it like a plas
15 minutes, and sooner, if
ensues, the whole should be w
warm water, and a little cold c
or spermaceti cerate, applied to
application of the liquid prepa
rally accompanied with gentle
being taken to prevent them
the adjacent parts. All the f
the object satisfactorily, with
ment; but some are much mor
others. A small wooden or bo
best for mixing them with.
be kept in well-stoppered b
liquid must be added to then
before their application; and
should be mixed than is requi
diate use.

Depilatory, Arsen'ical. Orpi
of arsenic) forms the principal
many fashionable depilatories,
not free from danger. The foll
known preparations:—

D.) From nitre and sulphur,
orpiment, 3 parts; quicklime,
es, 32 parts; boil to the con-
n. Very caustic.
's D.; 'POUDRE SUBTILE.')
; quicklime, 10 oz.; starch,

D.; ORIENTAL RUSMA.)—
oz.; orpiment, ½ dr.; strong
lb.; boil together in a clean
il a feather dipped into the
lue.
lash, 2 oz.; orpiment, 3 drs.;
, ½ pint; boil together as
the most caustic and conse-
t certain of depilatory prepara-
the rest of its class, open to the
taining orpiment. (See No. 7.)
; 'PÂTE ÉPILATOIRE.') To No.
ot, 3 parts.
D.; 'PASTA EPILATORIA.') Orpi-
quicklime and starch, of each,

'SAVON ÉPILATOIRE.') Turk-
nd soft soap, equal parts. Must
ntil about to be applied. (See

D.; TURKISH RUSMA.) Orpi-
quicklime, 9 parts. For use, it
ith soap lees, and a little pow-

Boudet's. *Prep.* Sulphide of
tallised), 3 parts; quicklime (in
10 parts; starch, 10 parts; mix.
with water, and applied to the
ped off in 2 or 3 minutes with a
. Very effective and safe.
, Cazenave's. *Syn.* MAHON'S D.;
ÉPILATOIRE DE CAZENAVE, Fr.
lime, 1 part; carbonate of soda,
d, 8 parts; mix. Applied as an

y, Chi'nese. *Prep.* 1. Quicklime,
sh (dry) and liver of sulphur, of
; all reduced to a fine powder;
kept in a close bottle.
D.) As No. 1., but coloured
rose pink or light red.
parations are applied in the same
Boudet's Depilatory.
y, Colley's. See ARSENICAL DE-
(above).
y, Hydrosul'phate of Lime. *Prep.*
Mix quicklime and water to a thick
pass into the mixture 25 or 30
olume of sulphuretted hydrogen gas.
gas ceases to be absorbed, stop the
The pulpy mass is spread on paper,
for 12 or 15 minutes. It is very
but has a most disgusting smell.
depilatory is a very similar prepa-
below).
y, Mechan'ical. *Syn.* DEPILATORY
Prep. From pitch and resin, equal
together *and spread on leather.*
's plaster.

Depilatory, Rayer's. *Prep.* Quicklime, 2 oz.; salt of tartar, 4 oz.; charcoal, ¼ oz. Less active than Chinese Depilatory.

Depilatory, Redwood's. *Prep.* A strong solution of sulphide of barium, made into a paste with powdered starch, and applied immediately. Mr. Redwood says this is "the best and safest depilatory."

Depilatory, Ro'seate. See CHINESE DEPILATORY (*above*).

Depilatory, Spolasco's. *Prep.* Freshly prepared sulphide of calcium and quicklime, equal parts. Almost equal to Redwood's (*above*).

DEPOSI'TION (of Metals). See ELECTROTYPE.

DER'BYSHIRE NECK. See GOITURE.

DESIC'CANTS. *Syn.* DESICCAN'TIA, L. In *pharmacology*, substances that check secretion and dry sores of abraded surfaces, without acting as styptics, or constringing the fibres of the parts to which they are applied. See ASTRINGENTS.

DESICCA'TION. *Syn.* EXSICCA'TION. The evaporation or drying off of the aqueous portion of solid bodies. Plants, and chemical preparations are deprived of their humidity by exposure to the sun, a current of dry air, an atmosphere rendered artificially dry by sulphuric acid, or by the direct application of heat by means of a water bath, a sand bath, or a common fire. Planks and timber are now seasoned, on the large scale, in this way, by which a condition may be produced, in 2 or 3 days, which on the old system is barely attainable in as many years. "Endeavours were made to enforce the importance and value of the desiccation of woods to the builder, cabinet maker, architect, and civil engineer, so long back as 1843, but without success. Since that period, certain persons have availed themselves, commercially, of our ideas and experiments on the subject, without any acknowledgment, either verbal or pecuniary." Cooley.

DESTEM'PER. *Syn.* DISTEMPER. Colours ground up with size, gum, or white of egg, and water, as in scene painting. The art of executing work in distemper, is called 'distemper painting.'

DETER'GENT. An agent having the power of removing offensive matter from the skin. The name is now generally restricted to applications that tend to cleanse foul wounds and ulcers.

Detergent, Collier's. *Prep.* From liquor of potassa, 2 fl. drs.; rose water, 5½ fl. oz.; spirit of rosemary, ½ fl. oz.; mix. One of the best applications known to free the head from scurf, when the hair is strong and healthy. The head should be afterwards sponged with clean, soft water.

DETONA'TION. See FULMINATING COMPOUNDS.

DEUTOX'IDE. See OXIDES.

DEW-POINT. The temperature at which *dew begins to form*, as observed by a thermometer. It varies with the humidity of the atmosphere.

DEX'TRIN. $C_6H_{10}O_5$. *Syn.* Starch Gum, Dextrina, Dextrinum, British Gum. A soluble substance resembling gum, formed by the action of dilute acids at the boiling temperature, and by infusion of malt, at about 160° Fahr., on starch. It is also formed when potato starch and some of the other farinas are exposed to a heat of about 400°. See Diastase and Gum (British).

DEX'TRO-RACE'MIC ACID. See Racemic Acid.

DIABE'TES. See Urine.

DIACH'YLON. See Plasters.

DIALY"SER. In *practical chemistry*, an instrument for separating 'crystalloids' from 'colloids,' introduced by the late Prof. Graham. In its most convenient form it consists of a hoop of gutta percha, over which a circular piece of parchment-paper is stretched. The paper is applied to the hoop while wet, and is kept stretched by a second hoop, by an elastic band, or by a few turns of string. The instrument, when complete, resembles an ordinary tambourine. It is distinguished as the 'HOOP DIALYSER.' The fluid to be 'dialysed' is poured into the hoop upon the surface of the parchment-paper, to a small depth only, such as half an inch, and the dialyser is then floated upon water in a large glass basin. Another form of dialyser, termed the 'BULB DIALYSER,' consists of a small glass bell-jar, the mouth of which is covered by a piece of parchment-paper. This is suspended or otherwise supported in a large vessel of water in such a manner that the parchment-paper septum just dips below the surface. See Dialysis (*below*), Parchment-paper.

DIAL'YSIS. In *practical chemistry*, the method of separating substances by 'diffusion' through a septum of gelatinous matter. When a solution having a sp. gr. greater is introduced into a cylindrical glass vessel, and then water very cautiously poured upon it, in such a manner that the two layers of liquid remain unmoved, the substance dissolved in the lower liquid will gradually pass into the supernatant water, though the vessel may have been left undisturbed, and the temperature remain unchanged. The gradual passage of a dissolved substance from its original solution into pure water taking place, notwithstanding the higher sp. gr. of the substance which opposes this passage, is called the 'diffusion of liquids.' From the investigation of the phenomena of this diffusion, the late Prof. Graham derived the remarkable results upon which the method under notice is based. Different substances, when in solution of the same concentration, and under other similar circumstances, diffuse with very unequal velocity. "The range in the degree of diffusive mobility," says Prof. Graham, "exhibited by different substances, appears to be as wide as the scale of vapourous. Thus, hydrate of potassa may be said to possess double the velocity of
sulphate of potassa, and sulphate
again double the velocity of su
and sulphate of magnesia. But th
named belong, as regards diffusion,
volatile class. The comparatively
as regards diffusion, is represented by
order of chemical substances (ma
the absence of the power to crysta
are slow in the extreme. Among
are hydrated silicic acid, hydrated al
other metallic peroxides of the alu
when they exist in the soluble
starch, dextrine, and the gums, ca
nin, albumen, gelatin, vegetable
extractive matters. Low diffusibi
the only property which the bodies
merated possess in common. They
tinguished by the gelatinous charact
hydrates. Although often largely
water, they are held in solution b
feeble force. They appear singularly
the capacity of acids and bases, and
ordinary chemical relations. But, on
hand, their peculiar physical aggregat
the chemical indifference referred to,
to be required in substances that can
in the organic processes of life. Th
elements of the body are found in
As gelatin appears to be its type, it is
to designate substances of this class
LOIDS,' and to speak of their peculiar
the 'colloidal condition of matter.'
to the colloidal is the 'crystalline
Substances affecting the latter form
classed as 'CRYSTAL'LOIDS.' The di
is, no doubt, one of intimate molec
stitution."[1] A certain property of
substances comes into play most opp
in assisting diffusive separations. T
of starch, that of animal mucus, of pe
vegetable gelose, and other solid coll
drates, all of which, strictly speaki
insoluble in cold water, are themselv
meable when in mass, as water is, by t
highly diffusive class of substances. B
jellies greatly resist the passage of
diffusible substances, and cut off entir
colloid substances like themselves th
be in solution. A mere film of the j
the separating effect. Now, parchmen
when wetted, acts just like a layer of
mucus or other hydrated colloid, by pe
the passage of crystalloids, but not of
consequently this substance may be
dialytic septa (see Dialyser, above
following experiments recorded by
will give some idea of the results wh
be obtained by dialysis:—

1. Half a litre of urine was pla
hoop dialyser, which was then float
considerable quantity of pure water.
for 24 hours, the urine gave its cry
constituents to the external water. T
evaporated by a water bath, yielded

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[1] "Philosophical Transactions" for 18

om this mass urea was ex-
ıl in so pure a condition as to
line tufts upon the evapora-
ol.

silicate of soda into diluted
d (the acid being maintained
a solution of silica is obtained.
to hydrochloric acid, such a
s chloride of sodium, a salt
silica to gelatinise when the
ed, and otherwise modifies its
r, such a solution, placed for
lyser of parchment-paper, was
$\frac{1}{2}$ of its silicic acid (silica)
hydrochloric acid. After 4
lyser, the liquid ceased to be
rate of silver. All the chlo-
, with no further loss of silica.
was a pure solution of silicic
ıld be boiled in a flask, and
ncentrated, without change.

e of dark-coloured porter, with
arsenious acid added ($\frac{1}{10,000}$th
s acid), was placed on a hoop
es in diameter, and the whole
arthenware basin containing 2
ater. After 24 hours the latter
ired a slight tinge of yellow.
n concentrated and precipitated
d hydrogen, upwards of one half
arsenious acid in a fit state for

The diamond is pure carbon,
om the carbon of charcoal and
ply in being limpid, colourless,
ractive of light, properties which
referred to its crystalline form.
and, consequently, the value of
stimated in carats, one of which
grains; and the price of one
pared to that of another of equal
rency, purity, form, &c., is as
of the respective weights. The
e of ROUGH DIAMONDS, that are
g, is about £2 for the first carat;
DIAMOND is equal to that of a
d of double weight, exclusive of
workmanship. "To estimate the
wrought diamond, ascertain its
ats, double that weight, and mul-
re of this product by £2." (Ure.)
diamond of—

1 carat is	worth	£8
2 carats	„	£32
3 „	„	£72
4 „	„	£128

&c., &c. See CARBON, GEMS.

Dust. Genuine diamond dust is
produced by the abrasion of dia-
at each other in the process of
polishing them. It possesses the
perty of polishing the gems, and
s finest edge to every kind of
The discovery of the *latter fact, a*
led certain dishonest persons to extensively advertise spurious preparations, consisting chiefly of emery powder or powdered quartz, under the name of diamond dust. The factitious articles acquired a very short and bad notoriety. Instead of sharpening cutting instruments, they infallibly destroyed their edge, and were particularly unfortunate in converting razors into saws.

DIAPEN'TE. *Syn.* PULVIS DIAPENTE. *Prep.* 1. (Ph. E. 1744.) Bay-berries, birth-wort, gentian, ivory dust, and myrrh, equal parts. An excellent warm tonic, especially useful in the debility and rickets of children. The substance sold under this name in the shops is an inferior mixture, used principally as a tonic in veterinary practice. The following are the forms commonly adopted in its preparation:—

2. Turmeric, 4 lbs.; laurel berries and mustard, of each, 3 lbs.; gentian, 2 lbs. (all in fine powder); mix.

3. Bay-berries, gentian, mustard, and turmeric, equal parts.

4. Gentian, 6 lbs.; bay-berries, 1 lb. This is the formula generally used by the farriers. Sometimes mustard, 1 lb., is added.

DIAPHORET'ICS. *Syn.* SUDORIF'ICS; DIAPHORETICA, SUDORIFICA, L. Medicines which promote or increase the perspiration. Those that produce this effect in a very marked degree are more particularly called 'sudorifics.' The principal diaphoretics are:—warm diluents, as barley-water, gruel, tea, &c.; salts of the alkalies, as the citrates of potassa and soda, acetate of potassa, acetate and carbonate of ammonia, sal-ammoniac, nitre, &c.; preparations of antimony, as antimonial powder, tartar emetic, &c.; also alcohol, camphor, Dover's powder, ipecacuanha, opium, wine, &c.

The *use* of diaphoretics is indicated in nearly all diseases accompanied by fever and a dry skin, and particularly in febrile and pectoral affections.

DI'APHRAGM (frăm). A partition through or across; a dividing substance. In *anatomy*, the term is applied to the midriff, a muscle separating the chest or thorax from the abdomen or lower belly. In *astronomy* and *optics*, the term is applied to a circular ring placed in a telescope or other instrument to cut off the marginal portions of a beam of light. In *electricity*, the name is commonly used to denote the porous partition, cell, or vessel, that separates the fluid containing the positive plate from the fluid which surrounds the negative plate, in a constant voltaic battery. Thin partitions of sycamore, or other porous wood, are accasionally used, but cells made of thin biscuit ware are the most convenient and durable diaphragms. Plaster of Paris, animal membrane, coarse and tightly wove canvas, &c., are used also for the purpose. Plaster cells are also formed by surrounding an oiled cylinder of wood with a hoop of paper, and pouring plaster of Paris, mixed up with water, into the space between the two. See ELECTROTYPE.

DIARRHŒ'A. A purging or looseness of the bowels. The causes of diarrhœa are various, but among the most common are the presence of irritating matter, worms, or acidity in the stomach or bowels; and exposure to cold (especially cold to the feet) or sudden changes of climate or temperature.

Treatm. In general, it will be proper to administer a mild aperient, for which purpose rhubarb or castor oil is usually preferred. The dose of the first may be from 20 to 30 grains in sugar, or made into a bolus; that of the second, from ¼ oz. to ½ oz., with a little mint or peppermint water. After the due operation of this medicine, opium, astringents, and absorbents, may be taken with advantage, but not in excessive doses, as is commonly the practice. The first and second are indicated when great irritability exists, and the third, in cases of diarrhœa arising from the presence of acidity. Chalk mixture, to which a few drops of laudanum have been added, or the compound powder of chalk and opium, are excellent medicines, and will generally quiet the bowels. A small piece of catechu or hard extract of logwood, sucked in the same way as a lozenge, is a pleasant method of taking either of these powerful astringents, and will generally cure cases of simple diarrhœa arising from excessive peristaltic motion, or want of tonicity of the muscular coats of the intestines.

In *bilious diarrhœa*, characterised by the bright yellowish-brown colour of the dejections, a dose of blue pill or calomel, assisted by mild diluents and demulcents, and warmth, generally proves efficacious. Small doses of opium are also useful in some cases.

In *catarrhal diarrhœa*, *chylous diarrhœa*, and the like varieties, characterised by the dejections being nearly colourless, and consisting chiefly of water and mucus; or white and milky, showing the entire absence of bile; or, being entirely liquid, limpid, and serous (in some cases resembling the washings of flesh), opinions are divided as to the treatment. The majority of the best authorities regard purging as injurious in these varieties, and rely chiefly on warm baths and warm fomentations, with the internal administration of mild salines and diaphoretics, followed by astringents, tonics, and occasional doses of opiates. *Choleraic diarrhœa* demands a nearly similar treatment.

The diet in every variety of diarrhœa should be light and non-irritating. Glutinous broths, beef-tea and arrow-root, are among the best articles which can be taken. To these may be added a little dry toast. Arrow-root (genuine), either with or without a spoonful of port wine or brandy (preferably the former), will of itself cure all ordinary cases of diarrhœa, if accompanied with repose and a recumbent posture.

Among external remedies, warm and stimulating fomentations, liniments, &c., to the epigastrium and abdomen, will be fou adjuncts to other treatment. A sp two of laudanum, used as a friction, rally allay pain, and in many cases bowels when all other remedies have in vain.

DI'ASTASE. A peculiar azotised contained in malt, which effects the of starch, first into dextrin, and grape sugar.

Prep. A cold infusion of malt is 158° Fahr. (to coagulate in album then allowed to cool, and alcohol is the filtered liquor, when diastase tated, under the form of a taste powder, which is freely soluble in wa

Prop., *&c.* Diastase seems to vegetable albumen, but very little respecting it, as it has never been state of purity. One part of diast pable of converting 2000 parts of st grape sugar. Malted barley is said $\frac{1}{200}$th part of this substance; yet portion is quite sufficient to convert of the malt into sugar during the op mashing, in the manufacture of BREWING, DEXTRIN, &c.

DICTA'MIA. A nutritious, dieteti *Prep.* (Beasley.) Sugar, 7 oz.; potat root, 4 oz.; flour of brent barley (*monococcum*), 3 oz.; Trinidad and chocolate, of each, 1 oz.; vanilla, 15 turate together.

DIDYM'IUM. Di. A rare metal associated with cerium and lanthaniu Swedish mineral cerite. See CERIUM.

DI'ET. Food or victuals. In medic regulated by certain rules, or presc the cure or prevention of disease. The part of medicine is no inconsiderable and deserves a much greater share of than it commonly meets with. A great of diseases might be removed by the ance of a proper diet and regimen, with assistance of medicine, were it not for patience of the sufferers. On all occa may come in as a proper assistant to t which sometimes cannot be performed a due observance of the non-naturals.

Writers on dietetics (DIETETICA, L taken much trouble to divide and cla numerous articles of food suitable various conditions of the body in hea disease; but little practical advanta resulted from their labours. Low diet, diet, full diet, milk diet, farinaceous di diet, and vegetable diet, are terms whic most circumstances, are sufficiently si be almost self-explanatory.

DIGES'TION. In *chemistry* and ph the operation of exposing bodies to and continuous heat. The best diges thin glass flasks and beakers, and th convenient source of heat is the sa Digestion is often performed to sof otherwise modify bodies that are to b

e term is applied to the con-
into chyme, or the process of
t in the stomach, and prepar-
lation and nourishment. In
n signifies a method of treat-
unds, &c. See DIGESTIVES

. In *surgery*, substances which,
wounds or tumours, induce or
ation. All stimulating appli-
this class. Heat is a most
ive agent. The action of
osed to that of DISCUTIENTS,
resolve tumours and indura-

Syn. DIGITA'LIA. A vege-
discovered by M. Royer in
rea, or purple foxglove.
jendie.) Foxglove leaves (pow-
digested in ether, first in the
heated under pressure; when
gain become cold, the liquor is
, and the ether is distilled off
; the residuum is dissolved in
red solution treated with hy-
lead, the whole gently evapo-
, and the dry residuum again
ether; from this solution the
d, by evaporation and repeated
crystalline form.
and Henry.) Foxglove leaves
l and powdered), 2½ lbs., are
tified spirit, and the tincture
tincture press; the spirit is
off, and the residual extract
istilled water, ½ pint, acidulated
fl. drs. of acetic acid, a gentle
loyed; some animal charcoal is
d the whole filtered; the filtrate
l with water, and partly neutra-
onia; a fresh-made, strong de-
is next added; a copious preci-
nnate of digitalin ensues; the
washed with water, and mixed
cohol, after which it is triturated
(in fine powder) and exposed to a
the whole is now digested in
cture treated with animal char-
porated; the dry residuum is,
with cold sulphuric ether, which
foreign matter, and leaves the
bs. 8 oz. of the dried leaves yield
. of the digitalin.
White, inodorous, porous masses,
; it crystallises with difficulty,
ter, and excites violent sneezing
to; dissolves freely in alcohol;
in cold ether; and takes 2000
for its solution; it is neither
aline; concentrated colourless
cid dissolves it, forming a cha-
tion which passes from yellow
. (Homolle.) It is one of the
of known poisons, being fully
ger than the *powdered leaves*
ast. *It is used in the same* cases.—*Dose*. $\frac{1}{60}$ to $\frac{1}{30}$ gr.; either made into pills or dissolved in alcohol and formed into a mixture. Owing to the difficulty and uncertainty connected with dispensing such small quantities, it is now seldom employed in this country.

DILL. *Syn*. ANETHUM (Ph. L. & E.), L. The fruit (seed) of *Anethum graveolens*, or garden dill, *Anethi fructus*, B. P. Dill is an aromatic stimulant and carminative. The Cossacks employ it as a condiment; and in this country it is frequently employed to heighten the relish of soups and pickles, especially cucumbers. DILL WATER is a favorite remedy of nurses to promote the secretion of milk, and to relieve the flatulence and griping of infants.—*Dose*. Of the powder, 10 grs. to ½ dr., or more. Oil of dill (OLEUM ANETHI) and dill water (AQUA ANETHI) are officinal in the pharmacopœias.

DIL'UENTS. *Syn*. DILUENTIA, L. *Aqueous liquors;* so named because they increase the fluid portion of the blood. Tea, barley-water, water-gruel, and similar articles, are the most common diluents, after pure water. The copious use of diluents is recommended in all acute inflammatory diseases, not of a congestive character, and to promote the action of diuretics and sudorifics.

DINNER PILLS. See PILLS.

DIOS'MA. *Syn* BOOKOO, BUKU; FOLIA BAROSMÆ, F. DIOSMÆ, L.; BUCHU (Ph. L.), BUCKU (Ph. E.), DIOSMA (Ph. L. 1836). "The leaves of *Barosma serratifolia*, *B. crenulata*, and *B. crenata*." (Ph. L.) These species were all included by De Candolle in the genus *Diosma*. Buchu is principally employed in chronic affections of the urino-genital organs, especially that of the mucous membrane of the bladder, attended with copious discharge of mucus.—*Dose*. 20 grs. to ½ dr. of the powder, taken in wine; or made into an infusion or decoction.

The officinal buchu leaves are "glabrous, glandular; either linear-lanceolate with small serrations, or ovato-oblong, obtuse, crenated, ovate or obovate, serrated." (Ph. L.) Their odour somewhat resembles that of rue, and their taste is warm and mint-like.

DIOS'MINE. A bitter extractive matter obtained by Brande from buchu leaves. It is very soluble in water, but not in alcohol and ether.

DISCU'TIENTS. In *surgery*, substances or agents which disperse or resolve tumours, &c. See DIGESTIVES.

DISINFECT'ANT. An agent which absorbs, neutralises, or destroys, putrescent effluvia and miasmata, and thus removes the causes of infection. The principal disinfectants are chlorine, the so-called chlorides of lime and soda, chloride of zinc, ozone, carbolic acid, the alkaline manganates and permanganates, peat charcoal, the fumes of nitric, nitrous, and *sulphurous acids*, heat, and ventilation. The *last two are the* most efficient and easily applied. The clothing, bedding, &c., of patients labouring under contagious diseases may be effectually disinfected by exposure to a temperature a little higher than that of boiling water, for about an hour. Neither the texture nor colour of textile fabrics is injured by a heat of even 250° Fahr. (Dr. Henry.) It is a practice at some of the workhouses to bake the clothes of the paupers who have the itch, or who are infested with vermin. Quicklime rapidly absorbs carbonic acid, sulphuretted hydrogen, and several other noxious gases, and is therefore commonly used as a wash for the walls of buildings. Acetic acid, camphor, fragrant pastiles, cascarilla, brown paper, and other similar substances, are frequently burnt or volatilised by heat, for the purpose of disguising unpleasant odours. The sulphates of iron and lime have the property of rapidly destroying noxious effluvia. A quantity of either of these sulphates thrown into a cesspool, for instance, will in a few hours render the matter therein quite scentless. Of gaseous disinfectants, "sulphurous acid gas (obtained by burning sulphur) is preferable, on theoretical grounds, to chlorine. No agent checks so effectually the first development of animal and vegetable life. All animal odours and emanations are immediately and most effectually destroyed by it." (Graham.) See ANTISEPTIC, DEODORISER, FUMIGATION, INFECTION, OZONE, also the DISINFECTING COMPOUNDS given *below*.

Disinfecting Compounds. 1. (SIR WM. BURNETT'S DISINFECTING LIQUID.) A concentrated solution of chloride of zinc. See ZINC.

2. (COLLINS' DISINFECTING POWDER.) A mixture of dry chloride of lime, 2 parts, and burnt alum, 1 part. *Used* either dry or moistened with water. See LIME.

3. (CONDY'S DISINFECTING FLUIDS.) Solutions of the alkaline manganates and permanganates. See MANGANESE.

4. (ELLERMAN'S DEODORISING FLUID.) This is said to consist chiefly of the perchlorides and chlorides of iron and manganese.

"In a report addressed to the Metropolitan Board of Works in 1859, Drs. Hofmann and Frankland stated that the perchloride of iron was the cheapest and most efficient deodoriser that could be applied to sewage." (Beasley.)

5. (LABARRAQUE'S DISINFECTING SOLUTION; LIQUOR SODÆ CHLORINATÆ, Ph. L. & D.) A solution of chlorinated soda, or, as it is commonly called, 'chloride of soda.' M. Labarraque made known this valuable disinfectant in 1822, and obtained the prize of the French 'Society for Encouraging National Industry' for its introduction.

6. (LEDOYEN'S DISINFECTING FLUID.) A solution of nitrate of lead, 1 part, in about 8 parts of water; or, of litharge, 13½ oz., in nitric acid (sp. gr. 1·38), 12 oz., previously diluted with water, 6 pints. Sp. gr. 1·40.

7. (SIRET'S DISINFECTING C
—*a.* A mixture of sulphate
lbs., sulphate of iron, 40 lbs.,
zinc, 7 lbs., and peat charcoal,
into balls.

b. Sulphate of iron, 20 parts;
zinc, 10 parts; tan or waste
powder), 4 parts; tar and oil, of
as before. *Used* for deodorisi
&c.

DISLOCA'TION. *Syn.* LUXA
CATIO, L. The forcible displa
bone from its socket, either b
disease. The latter happens whe
forming the joint have been
some independent organic affecti
siderable share of anatomical
required to detect the nature
dents; and it is much to be
students neglect to inform the
ciently on the subject." (Sir
In common cases, the bones may
replaced by forcibly extending th
should be done as early as possib
inflammation sets in. The latt
combated by aperients, local ble
erant lotions, &c. Dislocation
exist without the fact being
swelling and inflammation bein
other causes.

DISPLACE'MENT. See PERC

DISTEM'PER. A disease
usually characterised by a runn
nose and eyes, and a short dr
lowed by wasting of the flesh,
strength and spirits. At leng
suffers, and fits, paralysis of the
or convulsions come on. L
emetics are the best remedies.
much diarrhœa, astringents may
given. The violence of the fits
gated by the administration of an
and by the warm bath. The di
contagious disease, and is gene
weakly and very young dogs.
advanced stages of the disease a
lowed by recovery. Impatience
eyes, obstinate diarrhœa, spasmodi
a yellow colour of the skin, an
eruption, are also bad symptoms.

Distemper Powders (Blane's).
of these is said to be '*aurum*
bisulphide of tin. That of anoth
nostrum is a mixture of mercu
with a little rhubarb and ipecacu

DISTILLA'TION. The evapora
sequent condensation of the vap
by means of a still and refriger
similar apparatus. DRY DISTI
term applied to the distillation
per se, or without the addition
other volatile fluid. DESTRUCTI
TION is the distillation of subst
peratures sufficiently high to dec
by which their elements are
evolved in new combinations.

the separation of substances
; boiling-points, by distilling
a a gradually increasing heat,
e products which come over at
ratures in separate receivers.
on, Still, &c.

The art of the distiller; the
spirituous liquors as practised
le.

f distillation, as carried on in
f Great Britain, may be divided
al operations, viz.:—1. The
nation of a saccharine infusion
vegetable matters, as malt,
, &c. 2. The cooling of this
3. The fermentation, or pro-
ne sugar of the cooled wort is
lcohol. 4. The separation of
med by means of a still and
By the first operation, the
e formation of the alcohol are
e second, they are brought to
nost favorable to the transfor-
kes place in the third, after
emains to free the product of
on from the foreign matter with
sociated; this is done in the
correctly speaking, constitutes
of the process which can be
ion.

principles of the first three of
: operations are noticed in the
ING, Fermentation, &c. It
seen, that the amylaceous or
r of the grain is first 'sacchari-
wards converted into alcohol,
ain precautions are necessary to
ocess successful and economical.
the distilleries of Great Britain
analogous saccharine substances
d, in which case the vegetable
gar) essential to the formation of
eady present, and merely requires
on in water of a proper tempera-
eady to be subjected to immediate
. In general, however, the
pirit in England are the various
ain; barley, rye, maize, and rice
ommonly employed. These are
l mixed with bruised malt, in
portions, and are mashed in a
ner to malted grain. The fermen-
rried on until the density of the
es to lessen or 'attenuate,' which
ned by an instrument called a
ter. When this point is arrived at,
' is submitted to distillation, to
access of the acetous fermentation,
d lessen its alcoholic value.

he process of distilling off the spirit
ented 'wash' or 'wort,' a hydro-
ployed to ascertain the 'strength'
e that passes over. As soon as this
s a certain point, the operation is
d the 'spent wash' removed. *The
ined by the first distillation are* generally called 'low wines,' and have a specific gravity of about ·975. By rectification or 'doubling,' a crude milky spirit, abounding in oil, at first comes over, followed by clear spirit, which is received in a separate vessel. The process is continued until the alcoholic content of the distilled liquor has considerably diminished, when the remaining weak spirit that distils over, called 'faints,' is caught separately, and mixed with the low wines, preparatory to another distillation. The strongest spirit passes over first, and the condensed liquor gradually becomes weaker, until it ceases to contain alcohol. By receiving in separate vessels any given portion of the product, spirit of any required strength, within certain limits, may be obtained. The same object is more conveniently effected by surrounding the top of the capital of the still with a water bath, of a temperature corresponding to that of alcoholic vapour of the strength it is desired to obtain. Thus, if we keep the temperature of the water at about 198° Fahr., we shall obtain proof spirit; if at 192°, a spirit 20 o. p.; and so on for other strengths.

It is found from experience, and is readily accounted for by theory, that the lower the temperature at which the distillation is conducted, the stronger will be the product, and the less quantity of oil or other volatile matter will come over along with it. To promote this, it has been proposed to carry on the process *in vacuo*, but on the large scale this has never been adopted. The distillation of the wash is usually performed in a separate set of stills to those employed for the rectification of the low wines. For very strong and tasteless spirit, a third and even a fourth rectification is employed, conjointly with other methods, to abstract the water, and to remove any foreign matter that vitiates its odour or flavour. A portion of soap is generally put into the still with the wash, to prevent excessive frothing.

We have said that the processes of mashing, &c., in the distillery, are similar to those adopted in brewing beer. We may add, that as richness in alcohol, and not flavour, is the object aimed at in the distiller's wash, not only is a large quantity of unmalted grain employed, but the process of boiling the wort with hops is omitted altogether. The wort is commonly 'set' at 70° Fahr., and the fermentation and attenuation of the liquor pushed as far as possible by large and repeated doses of the best 'top-yeast' of the porter brewers.

It often happens that raw spirit prepared from damaged grain is contaminated with a highly acrid and volatile fatty substance, which is powerfully intoxicating, and irritating to the eyes and nostrils, and possesses an odour very similar to that of an alcoholic solution of cyanogen. This may be got rid of by dilution with water and skilful rectification, when most of it *passes over with the first* and last 'runnings,' *the intermediate* portion being less loaded with it. Another plan is to filter the spirit successively through 6 or 7 separate vessels containing pine or willow charcoal, before rectifying it. In some distilleries the contaminated spirit is well agitated with a considerable quantity of olive oil, and after repose decanted, diluted with water, and rectified as before. The ordinary corn oil or fusel oil of raw spirit is generally, for the most part, intercepted by a self-regulating bath arranged between the still-head and the refrigeratory.

The quantity of spirit obtained from various substances, and even from pure sugar, depends upon the skill with which the several operations are conducted. By theory, pure sugar should yield 51% of alcohol; but in practice 11·925 galls. of proof spirit is the largest quantity which has yet been obtained from 112 lbs. of sugar. By the revenue authorities this weight of sugar is estimated to afford 11⅓ galls. of proof spirit. The average product is, perhaps, about 1 gal. of spirit of this strength for every 10 lbs. of sugar. According to Harmstädt, 100 lbs. of starch yield 35 lbs. of alcohol, or 7·8 galls. of proof spirit; and 100 lbs. of the following grains produce the accompanying quantities by weight of spirit of sp. gr. ·9427, or containing 45% of pure alcohol:—wheat, 40 to 45%; rye, 36 to 42%; barley, 40%; oats, 36%; buckwheat, 40%; maize, 40%; the mean benig 3·47 galls. of proof spirit. It is found that a bushel of good malt yields 2 galls. of proof spirit, and that the largest quantity of proof spirit obtained from raw grain, mashed with ⅕ or ⅓ of malt, does not exceed 22 galls. per quarter.

The distiller is allowed to produce worts from any substance, and at any specific gravity, provided such gravity can be correctly ascertained by the saccharometer approved of by the Board of Inland Revenue. He is not, however, allowed to mash and distil at the same time. See ALCOHOL, BRANDY, FERMENTATION, FUSEL OIL, GIN, STILL, &c.

DISTOR'TIONS. See SPINE, STRABISMUS, SURGERY (Popular), &c.

DIURE'SIS. See URINE.

DIURET'ICS. *Syn.* DIURETICA, L. Medicines which promote the secretion of urine. The principal diuretics are—aqueous fluids, which act by increasing the watery portion of the blood, and—substances which promote the action of the kidneys. Most of the first produce copious diuresis, if the skin is kept cool. Among the last are acetate, bitartrate, and nitrate of potassa; oils of juniper, turpentine, cajeput, and copaiba; dilute spirit, and sweet spirits of nitre; decoction of common broom, &c.

DIVIDIVI. An astringent substance imported from Jamaica. It contains above 50% of tannin; whilst gall-nuts contain less than 3·5%, and the best oak-bark only 1·35%. Hence its value in tanning.

DOBEREINER'S LAMP. A portable apparatus for obtaining instantaneous light by the action of a jet of hydrogen on a
spongy platinum.

DOC'IMACY or **DOCIMAS'TI**
ASSAYING.

DOORS. Much annoyance is
perienced from the creaking of
may be prevented by rubbing a
a mixture of tallow and black
hinges; or by applying to them
a little sweet oil, once or twice
trifling trouble and expense (a p
twelvemonth) will be amply re
noiselessness and greater durabi
vent the noise of doors slamming
of vulcanised India rubber, co
may be placed so as to receive th

DOSE. In medicine the qua
prescribed at one time. The d
cinals vary with the sex, age,
constitutional strength, habituat
syncrasies of individuals. Diff
stances, especially of climate, ex
portant influence on the activity
Thus, the inhabitants of Eng
northern countries of Europe be
doses in their own climates, th
remove to warmer latitudes. W
appears to promote the action
cinals, whilst cold acts in a
Nor does the same rule apply to
Calomel, for instance, is generall
by children than by adults; while
them more powerfully, and req
to be diminished considerably be
cated by mere calculation or anal
medicines.

Prescribers ought not to fo
action of medicines is not simply
to the amount, but that each
dose below which it either prod
or one contrary to that which w
produce. Dr. Paris remarks, "
doses are disposed to produce loc
general effects;" and Dr. Barlow
opinion that "practitioners of
cially in the treatment of chr
from requiring an obvious effect
administered." Adult women
quire only three fourths the full
The following rules and tabl
framed, chiefly with reference t
Dr. R. E. Griffith correctly
scheme can be devised, founded
to which there are not many ex

I. *Formula of* Dr. Yo

For children under 12 *years, th
medicines must be diminished in
of the age* to *the age increased b*
2 years, the dose will be 1-7th
adult,

$$\text{for } \frac{2}{2+12} = 1\text{-}7$$

ical Table of Gaubius.

suppose the dose to be 1, or

require	$\frac{1}{12}$	or 5 grains.
„	$\frac{1}{8}$	or 8 grains.
„	$\frac{1}{6}$	or 10 grains.
„	$\frac{1}{4}$	or 15 grains.
„	$\frac{1}{3}$	or 1 scruple.
„	$\frac{1}{2}$	or ½ drachm.
„	$\frac{2}{3}$	or 2 scruples.
e full dose, or	1	or 1 drachm.

n inverse gradation must be observed.

gical Table of Phoebus.

65	50	25-40	20	16	12	8	5	2
$\frac{2}{3}$	$\frac{7}{8}$	1	$\frac{7}{8}$	$\frac{3}{4}$	$\frac{5}{8}$	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{1}{4}$

:	6	2	1
	$\frac{1}{5}$	$\frac{1}{12}$	$\frac{1}{24}$

'r.] *Syn.* Douche bath. A much employed by hydro- r the relief of local affections, ealthy stimulus to the whole uche consists of a single jet of ing in size from the thickness at of a man's arm; it is pro- eat force, either from above, side, upon a particular part of Bath (Shower).

WDERS. See Powder.

. *Syn.* Dra'cine, Red resin lood. A peculiar vegetable 'ered by M. Melandre in dra-

n's blood is dissolved in alcohol, ltered, concentrated, and pre- old water; the red, spongy pre- washed, neutralised with dilute again liberated, and well washed

Draconine has a fine red colour; odorous, and flexible; it fuses The smallest quantity of car- in filtering paper may be de- phate of draconine, the yellow ly turning red.

LOOD. *Syn.* Sanguis dra- rich red-coloured resin, obtained pecies of the genus *Calamus*. Its lump, is a dark brownish-red; right red. It is friable, breaks g fracture, and has a sp. gr. not 1·196 or 1·197. When pure, it ves in alcohol, ether, and oils, red, transparent solutions. Adul- ctitious dragon's blood is only , and lacks the rich colour of the e. Dragon's blood is chiefly varnishes and lacquers.

ood, Factitious. *Prep.* 1. Shell- t, remove from the fire, and add, , 6 oz., *and gum benzoin, 2 oz.;* mix well, stir in red sander's wood, 1¼ lb., and Venetian red, ½ lb. (both in fine powder); and form the mass into sticks.

2. As the last, omitting the red Venetian.

DRAUGHT. *Syn.* Haustus, L. A single dose of liquid medicine, usually dispensed in one-and-a-half-ounce or two-ounce phials. Draughts are almost exclusively extemporaneous compounds, and differ from 'mixtures' only in containing one dose; whereas mixtures contain several. The latter have now very generally superseded draughts among all but the higher classes, when the dose is to be frequently repeated. Draughts possess the advantages of extreme convenience, and, from only one phial being opened at a time, of preserving the preparation better than when it is exposed to the air by the frequent removal of the cork. They are usually taken from a wine-glass, which they about ⅔rds fill.

In the preparation of draughts the same precautions are observed as are pointed out under Mixture; regard being had to the increased volume of the dose. The ingredients of a six-ounce mixture, for example, containing (say) 12 doses, may be equally distributed among a dozen draught-phials, after which each may be filled up with distilled water, or any other simple vehicle. In most cases, a little syrup may be advantageously added. In many instances no addition will be required, the doses of each form of preparation being the same.

The following are useful formulæ, which will serve as examples for others of the class. The number might be easily multiplied, and, indeed, might be extended so as to include ⅘ths of the whole materia medica; but such a plan would lead to useless repetitions, and occupy much space. See Mixture, Prescribing, &c.

Draught, Abernethy's. See Abernethy Medicines and Mixture.

Draught, Ace'tate of Ammo''nia. *Syn.* Haustus ammoniæ acetatis, L. *Prep.* 1. (St. B. Hosp.) Solution of acetate of ammonia, 4 fl. drs.; water to make 1½ fl. oz.

2. (Dr. Paris.) Camphor mixture, 1½ fl. oz.; liquor of acetate of ammonia, 4 fl. drs.; antimonial wine, 20 drops; mix. As a refrigerant and diaphoretic in febrile affections; taken late in the evening.

Draught, Ac'etate of Potas'sa. *Syn.* Haustus potassæ acetatis, L. *Prep.* (Mid. Hosp.) Acetate of potassa, 30 grs.; bicarbonate of potassa, 20 grs.; peppermint water, 1 fl. oz. Diuretic, antacid, and laxative.

Draught, Ammoni'acal. *Syn.* Haustus ammoniacalis, H. ammoniæ, L. *Prep.* (Brande.) Liquor of ammonia, 20 to 30 drops; compound tincture of cardamoms and tincture of gentian, of each, ½ fl. dr.; camphor mixture, 1½ fl. oz. An aromatic absorbent and stomachic; in heartburn, acidity, low spirits, &c.

Draught, An'odyne. *Syn.* Haustus *anodynus, L. Prep.* 1. Tincture of opium, 15 drops; pimento water and syrup of poppies, of each, 2 drs.; water, 1 fl. oz.

2. (Copland.) Nitre, 6 grs.; laudanum, 12 drops; compound spirit of ether, 1 fl. dr.; syrup of poppies, 2 fl. drs.; camphor mixture, 9 fl. drs.

3. (Ellis.) Tincture of opium, 15 to 25 drops; syrup of poppies, 2 fl. drs.; spirit of cinnamon, 1 fl. dr.; distilled water, 1½ fl. oz.

4. As the above, but substituting a like quantity of solution of either acetate or hydrochlorate of morphia in lieu of the laudanum. All the above are given as soothing draughts to allay pain and produce sleep, especially the last thing at night. No. 4 is to be preferred if there are febrile symptoms present.

Draught, Antac'id. *Syn.* HAUSTUS ANTACIDUS, L. *Prep.* 1. Bicarbonate of soda, 20 grs.; tincture of calumba, 3 fl. drs.; tincture of hops, 1 fl. dr.; syrup of orange peel, 2 fl. drs.; water, 6 fl. drs. To improve the appetite in heartburn and dyspepsia; taken 1 hour before a meal.

2. Liquor of ammonia, 16 drops; syrup of saffron, 2 fl. drs.; infusion of gentian, 3 fl. drs.; water, 7 fl. drs. As the last, taken occasionally, especially in debility, low spirits, &c.

3. (Collier.) Compound tincture of cardamoms, 1 fl. dr.; solution of bicarbonate of magnesia (fluid magnesia), 9 fl. drs.; simple syrup, 2 fl. drs. Twice a day; in dyspepsia, heartburn, &c., especially in gouty patients.

4. (A. T. Thomson.) Magnesia, 1 dr.; peppermint water, 1½ fl. oz.; tincture of orange peel, 1 fl. dr. In dyspepsia, &c., with acidity or diarrhœa.

5. As No. 1, but using bicarbonate of potassa for bicarbonate of soda. In acidity, diarrhœa, &c., accompanied by great irritability of the coats of the stomach.

6. Prepared chalk, 30 grs.; spirit of nutmeg and tincture of opium, of each, 12 to 20 drops; syrup of saffron, 3 drs.; cinnamon water, 1 fl. oz. In acidity, with extreme looseness of the bowels.

Draught, Anti-arthrit'ic. *Syn.* HAUSTUS ANTI-ARTHRITICUS, L. *Prep.* 1. Tincture of colchicum seeds (Ph. L.), 1 to 1½ fl. dr.; syrup of orange peel 2½ fl. drs.; water, 1 fl. oz. In gout; taken over-night, followed by another in the morning.

2. (Brande.) Wine of colchicum, ½ fl. dr.; carbonate of magnesia, 15 grs.; cinnamon water, ½ fl. oz.; water, 1 fl. oz. As the last.

3. (Sir C. Scudamore.) Magnesia, 18 grs.; Epsom salts, 1½ dr.; vinegar of colchicum, 1½ fl. dr.; simple syrup, 1 fl. dr.; cinnamon water, 9 fl. drs. As the last.

4. (Sir H. Halford's GOUT PREVENTIVE.) From compound infusion of gentian, 1½ fl. oz.; tincture of rhubarb, 1 fl. dr.; bicarbonate of potassa, 15 grs.

Draught, Anti-asthmat'ic. *Syn.* HAUSTUS ANTI-ASTHMATICUS, L. *Prep.* Vinegar of squills, ½ fl. dr.; ipecacuanha wine,
cinnamon water, 1½ fl. oz. Expecto
to be taken three times daily
attack.

Draught, Anti-emet'ic. *Syn.* H
TI-EMETICUS, L. *Prep.* 1. Juice
liquor opii sedativus, 10 drops (or
15 drops); ether, 20 drops; sim
drs.; water, q. s.

2. (HAUSTUS ANTI-EMETICUS
P.C.) Bicarbonate of potassa, 30
juice, 4 drs.; syrup of lemon, 1 oz
oz.; mix quickly, and tie down th
check nausea and vomiting. The
given effervescing.

Draught, Anti-hyster'ic. *Syn.*
ANTI-HYSTERICUS, L. *Prep.* Cya
tassium, 1 gr.; lettuce water (dis
oz.; syrup of orange flowers, 1½
5½ fl. oz.; for 6 draughts. One
when the fit is expected, and a sec
an hour. Should the fit come
may be repeated at intervals of
minutes until 3 or 4 have been
administered. The symptoms, h
tense, are generally either at once
greatly alleviated by this treatment

Draught, Antilith'ic. *Syn.* HAU
LITHICUS, L. *Prep.* 1. (Venable
8 grs.; bicarbonate of soda, 10 gr
water, 8 fl. oz. For a draught; in

2. (Dr. Paris.) Carbonate of sod
tincture of calumba, 1 fl. dr.;
quassia, 1 fl. oz.; water, 3 fl. drs.
sia and gravel, attended with the
diathesis.

Draught, Anti-neural'gic. *Syn.*
ANTI-NEURALGICUS, H. NARCOTINÆ
(Jeston.) Narcotine, 2 grs.; diluted
acid, 20 drops; infusion of roses,
One every 2 hours in the intermiss
ralgia.

Draught, Antisep'tic. *Syn.* HAU
SEPTICUS, L. *Prep.* (Dr. Collier
tion of yellow bark, 1 fl. oz.;
opium, 5 drops; spirit of pimento
of each, 2 fl. drs. In putrid fevers,
&c.

Draught, Antispasmod'ic. *Syn.*
ANTISPASMODICUS, L. *Prep.* 1. (
Tincture of castor, 1 fl. dr.; sulph
10 drops; peppermint water, 11 fl.
In hysteria, and that species of irre
cular action dependent on debility.

2. (Dr. Gregory.) Fetid spirit of
½ to 1 fl. dr.; camphor mixture,
syrup of saffron, 1 fl. dr. In cases
with low spirits, debility, &c.

3. (A. T. Thomson.) Musk mix
drs.; liquor of ammonia, 16 drop
of castor, 1 fl. dr.; syrup of poppie
mix. Three or four times daily,
and convulsive affections, after the
been well cleared by some aperient

4. (A. T. Thomson.) Oil of
drops; magnesia, 20 grs.; tinctu

mint water, 10 fl. drs.; mix.
spasms of the stomach.
'rient. *Syn.* HAUSTUS APE-
p. 1. (Paris.) Infusion of
tincture of senna, tincture of
of senna, of each, 1 fl. dr.;
a, 1 dr.; mix.
som salts, 4 drs.; tincture of
.; syrup of ginger, 1 fl. dr.;
atile, 20 drops; infusion of

) Tartrate of potassa, 3 drs.;
a and syrup of saffron, of each,
of senna, 1½ oz. The above
nts, and in their composition
semble the ordinary "black

SCING A. D.)—*a.* (Dr. Barker.)
potassa, 73 grs.; carbonate of
water, q. s.; dissolve the two in
s, mix the solutions, and drink
cing, in the same way as soda

y.) Bicarbonate of soda, 1 dr.;
te of soda, 2 drs.; dissolve in
f a glassful of cold water; and
nother like quantity of water,
ation tartaric acid, 40 grs., and
ge peel, 1½ fl. dr.; and drink it

Potassio-tartrate of soda, 2 drs.;
f soda, 40 grs.; dissolve, and add
l or 2 table-spoonfuls.
.) Cream of tartar, 3 drs.; car-
da, 2½ drs.; throw them into a
ottle three parts filled with cold
immediately, and wire down the
last three are examples of FAC-
RVESCING SEIDLITZ WATER, and
line aperients. The method of
may be varied by mixing the dry
(in fine powder) on a piece of paper,
ng the mixture suddenly into a
ds filled with water, and drinking
hilst effervescing. See CATHARTIC

Ap'petite. See DINNER DRAUGHT.
Aromat'ic. *Syn.* AROMATIC ANT-
UGHT; HAUSTUS AROMATICUS, L.
Aromatic confection, 1 dr.; spirit
ile, ½ dr.; syrup of saffron, 2 drs.;
ater, 9 fl. drs. Excellent in dys-
h acidity, and in diarrhœa, preceded
rient.
AROM. CUM RHEO.—St. B. Hosp.)
confection, 1 dr.; infusion of rhubarb
mon water, of each, 6 fl. drs. In
and dyspepsia, especially when there
and deficiency of bile.
t, Astrin"gent. *Syn.* HAUSTUS A-
s, L. *Prep.* 1. Tannin, 3 grs.; rec-
it, 1 fl. dr.; simple syrup, 2 fl. drs.;
fl. drs.
Paris.) Chalk mixture, 1½ fl. oz.;
of catechu, 1 fl. dr.; laudanum, 15

3. (Thomson.) Extract of logwood, 12 grs.; tincture of catechu, 1 fl. dr.; cinnamon water, 15 fl. drs. The above are excellent remedies in diarrhœa (preceded by a purgative), and in dysentery, &c. One may be taken after each motion.

Draught, Black. See MIXTURE.

Draught, Cam'phor. *Syn.* HAUSTUS CAMPHORÆ, L. *Prep.* (Guy's Hosp.) Camphor, 6 grs.; rectified spirit, q. s. to powder; white sugar, 1 dr.; mucilage, 3 drs.; water, 1½ fl. oz. Anodyne and diaphoretic, &c.

Draught, Cas'tor Oil. *Syn.* HAUSTUS OLEI RICINI, L. *Prep.* (Guy's Hosp.) Castor oil, 4 drs.; yelk of egg, q. s. (2 in no.); simple syrup, 1 fl. dr.; cassia or cinnamon water, 1 fl. oz. Aperient.

Draught, Cathar'tic. *Syn.* HAUSTUS CATHARTICUS, L. The following are given as additions to those under APERIENT D., and other heads:—*Prep.* 1. (Dr. Thomson.) Tartrate of potassa, 5 drs.; tincture of senna, 1 fl. dr.; infusion of senna, 14½ fl. drs.; syrup of saffron, ½ fl. dr.; mix. In acute diseases, taken early in the morning.

2. (Thomson.) Epsom salts and manna, of each, 2 drs.; infusion of roses, 14 fl. drs.; dilute sulphuric acid, 10 drops. In inflammatory affections, and to check vomiting in low fevers.

3. (Thomson.) Carbonate of magnesia, 1 dr.; powdered rhubarb, 20 grs.; peppermint water, 12 fl. drs. In dyspepsia, attended with costiveness and acidity, taken an hour before dinner.

4. (Thomson.) Castor oil, 5 fl. drs.; powdered gum, 20 grs.; rose water, 1 fl. oz.; compound tincture of lavender, 8 drops; syrup of poppies, 1 fl. dr. In colic and calculus. The above differ from aperient draughts simply in their greater strength.

Draught, Chalk. *Syn.* HAUSTUS CRETÆ, L. *Prep.* 1. From powdered gum, chalk, and simple syrup, of each, 1 dr.; aromatic water (as that of caraway, cinnamon, nutmeg, pimento, or peppermint), 1½ fl. oz.

2. (CHALYBEATED C. D.; HAUSTUS CRETA ET FERRI, L.—Paris.) Chalk mixture, 7 fl. drs.; compound mixture of iron, 3 fl. drs.; sesquicarbonate of ammonia, 5 or 6 grs. In diarrhœa, particularly in that arising from debility and anæmia.

3. (C. D. WITH RHUBARB; HAUSTUS CRETÆ CUM RHEO, L.)—*a.* Simple chalk mixture (see *above*), 1½ fl. oz.; powdered rhubarb, 12 grs.

b. (Lond. Hosp.) Commercial powder of chalk with opium, 12 grs.; rhubarb, 15 grs.; syrup of saffron and compound tincture of cardamoms, of each, 1 dr.; caraway water, 10 fl. drs. In heartburn, dyspepsia, and certain forms of diarrhœa.

Draught, Chlo"rine. *Syn.* HAUSTUS CHLORINII, L. *Prep.* (Copland.) Chlorine water, ½ fl. dr.; water, 1½ fl. oz.; mix, and add of syrup of poppies, ½ fl. dr. One every 6 hours;

in the worst form of typhus fever, and other putrid diseases, &c.

Draught, Cit′rate of Ammo″nia. *Syn.* HAUSTUS AMMONIÆ CITRATIS, H. A. SESQUICARBONATIS EFFERVESCENS, L. *Prep.* (Guy's Hosp.) Sesquicarbonate of ammonia, 20 grs.; water, 1 fl. oz.; dissolve, and add of lemon juice, ½ fl. oz. An agreeable, cooling, saline draught in febrile cases.

Draught, Cit′rate of Potas′sa. *Syn.* HAUSTUS POTASSÆ CITRATIS, L. *Prep.* From carbonate of potassa, 24 grs. (or bicarbonate, 29 grs.); water, 1 fl. oz.; dissolve, and add of lemon juice, 5 fl. drs. As the last. 20 grs. of citric acid may be used instead of the lemon juice.

Draught, Col′chicum. See ANTI-ARTHRITIC DRAUGHT.

Draught, Copai′ba. *Syn.* HAUSTUS COPAIBÆ L. *Prep.* (St. B. Hosp.) Balsam of copaiba, ½ fl. dr.; mucilage (thick), 4 fl. drs.; pimento water, 3 fl. drs.; water, 5 fl. drs. In gonorrhœa, &c.

Draught, Cough. See MIXTURE.

Draught, Diaphoret′ic. *Syn.* HAUSTUS DIAPHORETICUS, L. *Prep.* 1. (Collier.) Infusion of serpentary, 1½ fl. oz.; tincture of serpentary, 1 fl. dr. Tonic and diaphoretic.

2. (Thomson.) Sesquicarbonate of potassa, 20 grs.; fresh lemon juice, 4 fl. drs.; tartrate of antimony, ⅙ gr.; water, 11 fl. drs.; syrup of poppies, 1 fl. dr. Antifebrile and diaphoretic.

3. (Thomson.) Liquor of acetate of ammonia, 6 fl. drs.; camphor mixture, 10 fl. drs.; nitrate of potassa, 10 grs.; syrup of tolu, ½ fl. oz. Anodyne and diaphoretic. All the above are used in inflammatory affections.

Draught, Din′ner. *Syn.* APPETITE DRAUGHT; HAUSTUS DICTUS ANTE CIBUM. *Prep.* 1. Tinctures of cascarilla, hops, and rhubarb, of each, 1 fl. dr.; spirit of sal-volatile, ½ fl. dr.; tincture of capsicum, 20 drops; syrup of orange peel, 2 drs.; water, 1½ fl. oz.

2. Compound tincture of gentian, ½ fl. oz.; sal-volatile, ½ a teaspoonful; cinnamon water, 1 fl. oz.; compound tincture of cardamoms, 1 teaspoonful. Either of the above to be taken an hour before a meal.

Draught, Diuret′ic. *Syn.* HAUSTUS DIURETICUS, L. *Prep.* 1. (Collier.) Tincture of jalap, 2 fl. drs.; vinegar of squills, 1 fl. dr.; peppermint water, 10 fl. drs.; mix.

2. (Copland.) Acetate of potassa, ½ dr.; infusion of quassia and cinnamon water, of each, 6 fl. drs.; vinegar of squills and sweet spirits of nitre, of each, ½ fl. dr.

3. (Thomson.) Nitre, 8 grs.; tincture of digitalis, 16 drops; infusion of roses, 13 fl. drs.; syrup of roses, 1 fl. dr.

4. (Turner.) Nitre and powdered gum, of each, 15 grs.; almond mixture, 1½ fl. oz. The above are used as diuretics in dropsy; the last, also in scurvy, and in the incontinence of urine of children.

Draught, Donovan's. *Syn.* DRAUGHT OF
HYDRIODATE OF ARSENIC AND
HAUSTUS HYDRIODATIS ARSENICI
GYRI, L. *Prep.* (Donovan.)
driodate of arsenic and mercury (
2 fl. drs.; distilled water, 3½ fl.
ginger, ½ fl. oz.; mix for 4
night and morning; in lepra,
and some other obstinate
It must not be allowed to
metallic.

Draught, Efferves′cing. *Prep.* (
Sesquicarbonate of soda, 30 grs.;
peppermint water, 1½ fl. oz.;
peel, 2 fl. drs.; tincture of
tartaric or citric acid, 25 grs.;
last, and drink whilst effervescing.
tonic, and anti-emetic; in acidity,
&c. (See *antè*.)

Draught, Emet′ic. *Syn.* HAUSTUS
L. *Prep.* 1. Sulphate of zinc, 15
grs.; water, 9 fl. drs.; dissolve.
poisoning, and at the
attack of ague.

2. (Copland.) Ipecacuanha, 30
quicarbonate of ammonia, 20 grs.;
capsicum, 30 drops; oil of
drops; mint water, 2 fl. oz. As a
emetic in cases of poisoning by
other narcotics.

3. (Guy's Hosp.) Antimonial
drs.; ipecacuanha wine, 6 fl. drs.;
drs. For unloading the stomach in
cases.

4. (Mid. Hosp.) Tartar emetic,
ipecacuanha, 20 grs.; syrup, 2 fl. drs.;
10 fl. drs. As the last.

5. (Dr. Pickford.) Sulphate of zinc,
sulphate of magnesia, 4 drs.; water,
When it is also desired to act rapidly
bowels.

6. (Rodier.) Sulphate of copper,
water, 2 fl. oz. In poisoning by

7. (Sprague.) Ipecacuanha, 30
quicarbonate of ammonia, 20 grs.;
capsicum, 1 fl. dr.; peppermint water,
In poisoning by narcotics.

8. (A. T. Thomson.) Ipecacuanha,
ipecacuanha wine, 2 fl. drs.; water,
drs. For unloading the stomach in
cases.

9. (Trousseau.) Ipecacuanha, 8 grs.
of ipecacuanha, 1 fl. oz.; water, q.
draughts. One every 10 minutes,
miting occurs.

Draught, E′ther. *Syn.* HAUSTUS
L. *Prep.* (Neligan.) Sulphuric ether,
spermaceti, 3 grs.; rub together (
and add of peppermint water, 10 fl.
excellent stimulant and antispasmodic,
symptoms being absent.

Draught, Expec′torant. *Syn.*
PECTORANS, L. *Prep.* 1. (Collier.)
of ammoniacum and almonds, of
drs.; tincture of squills, 12 drops.
ness, chronic coughs, &c.

Draught, Hen′bane. *Syn.*

›. 1. Tincture of henbane, 30
up of saffron, 1 fl. dr.; water,
dyne and soporific. *Used* to
xcitement, and induce sleep,
is inadmissible.

AND SQUILLS D.; HAUSTUS
SCILLÆ, L.—Dr. Bree.) Ex-
, 3 grs.; tincture of squills, 10
itric acid, 6 drops; water, 1½
and expectorant; in asthmas,
&c.

rocyan'ic. *Syn.* HAUSTUS HY-
. *Prep.* 1. (Donovan.) Cy-
um, 1 gr.; syrup of lemons, ½
water, 7½ fl. oz. For 8 draughts.

kson.) Medicinal hydrocyanic
15 drops; liquor of ammonia,
p of orange flowers (or simple
.; water, 8½ fl. oz.; mix, and
draughts. One, two, or three
in gastrodynia, and all those
ous and hysterical affections
excessive irritability, mental
n a case that came under our
h life was an absolute burden
relief was afforded by the first
4 or 5 effected a comparative
almost every other remedy had
ain.

annec's. *Syn.* LAENNEC'S CON-
T DRAUGHT; HAUSTUS CONTRA-
. *Prep.* From tartar emetic,
of poppies, 2 fl. drs.; orange-
1½ fl. oz. Every two hours in
.

ax'ative. *Syn.* HAUSTUS LAXANS,
See APERIENT DRAUGHTS.

pland.) Infusion of senna and
fusion of gentian, of each, 6 fl.
e of potassa, 20 to 30 grs.; ex-
acum, 30 to 40 grs.; compound
ardamoms, 1½ fl. dr. Aperient,
d alterative.

Mor'phia. *Syn.* HAUSTUS MOR-
rep. (Brera.) Morphia, ¼ gr.;
ppies, 1 fl. dr.; water, 11 fl. oz.
e drops of acetic acid may be
ly added. At bed-time, as a

Narcot'ic. *Syn.* HAUSTUS NAR-
OPIATUS, L. *Prep.* 1. (St. B.
danum, 12 to 20 drops; syrup of
1 fl. dr.; pimento water, 3 fl. drs.;
. To induce sleep in slight cases,
absent.

. Thomson.) Camphor mixture,
danum, 35 drops; sulphuric ether
saffron, of each, 1 fl. dr. In in-
adache.

on.) Carbonate of ammonia, 15
lemon juice, ½ fl. oz.; water, 1 fl.
of nutmeg, 1 fl. dr.; syrup of
½ fl. dr.; tincture of hemlock, 10
ases of increased *irritability.*
n.) *Carbonate of potassa, 20 grs.;* fresh lemon juice, ½ fl. oz.; peppermint water, 1 fl. oz.; laudanum, 25 drops; syrup of tolu, ½ fl. dr. To procure sleep in the majority of diseases. (See *above.*)

Draught, Nux Vom'ica. *Syn.* HAUSTUS NUCIS VOMICÆ, L. *Prep.* (Dr. Joy.) Nux vomica (in fine powder), 3 grs.; powdered gum, 2 drs.; compound tincture of cardamoms, 1 fl. dr.; cinnamon water, 10 fl. drs. Diuretic, narcotic, stimulant, and tonic; in paralysis, impotence, debility, &c., unaccompanied by inflammation of the nervous centres. See STRYCHNIA.

Draught, Refri''gerant. *Syn.* HAUSTUS REFRIGERANS, L. *Prep.* 1. Carbonate of potassa, 20 grs.; syrup of orange peel, 1 fl. dr.; spirit of nutmeg, ½ fl. dr.; water, 1½ fl. oz.

2. (Thomson.) Nitre, 12 grs.; almond mixture, 1½ fl. oz.; syrup of tolu, 1 fl. oz.

3. (Collier.) Carbonate of potassa, 20 grs.; antimonial wine, 20 drops; syrup of orange peel, 1 fl. dr.; tincture of orange peel, ½ fl. dr.; water, 1½ fl. oz.; mix, and add a large tablespoonful of lemon juice. In inflammatory diseases, &c.

Draught, Saline'. See EFFERVESCING DRAUGHT, &c.

Draught, Stomach'ic. See DINNER DRAUGHT, &c.

Draught, Ton'ic. *Syn.* STRENGTHENING DRAUGHT; HAUSTUS TONICUS, L. *Prep.* 1. (Collier.) Disulphate of quinine, 2 grs.; tincture of orange peel, 1 fl. dr.; diluted sulphuric acid, 5 drops; laudanum, 10 drops; infusion of cascarilla, 1½ fl. oz. In pyrosis, &c., 1 hour before dinner.

2. (A. T. Thomson.) Infusion of yellow bark, 1½ fl. oz.; compound tincture of cinchona, 1 fl. dr.; powdered cinchona, 40 grs.; syrup of orange peel, ½ fl. dr. In intermittents and acute rheumatisms.

3. (Thomson.) Infusion of cascarilla, 1½ fl. oz.; tincture of cascarilla and ginger, of each, 1 fl. dr. In dyspepsia, arising from intemperance.

4. (Walton.) Infusion of cascarilla, 9 fl. drs.; tinctures of rhubarb and ginger, of each, 1 fl. dr.; syrup of saffron, ½ fl. dr.; ammonio-citrate of iron, 6 grs.; tincture of capsicum, 5 drops. In anæmia, and debility accompanied by paleness and relaxation.

Draught, Ver'mifuge. *Syn.* HAUSTUS VERMIFUGUS, H. ANTHELMINTHICUS, L. *Prep.* (M. Levacher.) Castor oil, 4 drs.; essence of turpentine, 2 drs.; mint water, 2 fl. oz.; syrup, 1 fl. oz.; powdered gum, 2 drs.; for an emulsion. In tapeworm.

DRAW'INGS. Chalk and pencil drawings may be fixed, so as not to suffer from slight abrasion, by washing them with skimmed milk, or with water holding in solution a little isinglass or gum. When the first is used, great care must be taken to deprive it of the whole of the cream, as the latter substance would *cause the drawing to* look streaky. An easy *way of applying these* fluids is to pour them into a shallow vessel, and to lay the drawing flat upon the surface of the liquid; after which it should be gently removed and placed on white blotting-paper, in an inclined position, to drain and dry.

DRENCHES. *Syn.* DRINKS. In *veterinary practice*, these terms are applied to liquid medicines or mixtures which are administered to horses and neat cattle, and chiefly to the latter. A drench for a HORSE should not be less than half a pint, nor more than a quart; about a pint is, perhaps, the best quantity; that for a COW or OX should measure about a quart, and not more than about 5 half-pints. See VETERINARY MEDICINE.

DRES'SING. In the *industrial arts*, a preparation of gum, starch, size, &c., employed in stiffening or 'finishing off' textile fabrics and paper. In *surgery*, the term is appropriated to any application to a wound or sore, made by means of lint, linen, or leather. SIMPLE DRESSING is simple cerate or spermaceti cerate. Among *cooks*, the stuffing of fowls, pork, veal, &c., is commonly called 'dressing.'

DRINKS (Summer). See GINGER BEER, LEMONADE, SHERBET, &c.

DROP. See MEASURES.

DROPS (Confectionery). These are confections of which the principal basis is sugar. They differ from lozenges chiefly in the ingredients being combined by the aid of heat. Occasionally, they are medicated.

Prep. Double refined sugar is reduced to powder, and passed through a hair sieve (not too fine), and afterwards through a gauze sieve, to take out the fine dust, which would destroy the beauty of the drop. It is then put into a clean pan, and moistened with any favorite aromatic, as rose or orange-flower water, added slowly, stirring it with a paddle all the time, from which the sugar will fall as soon as it is moist enough, without sticking. The colouring (if any) is next added, in the liquid state, or in very fine powder. A small, polished copper, or tinned-copper pan, furnished with a lip, is now one half or three parts filled with the paste, and placed over the fire, or over the hole of a stove, or preferably on a sand bath, and the mixture stirred with a little bone or glass spatula until it becomes liquid. As soon as it almost boils, it is taken from the fire, and if it is too moist, a little more powdered sugar is added, and the whole stirred, until it is of such a consistence as to run without too much extension. A tin plate, very clean and smooth, and very slightly oiled, being now ready, the pan is taken in the left hand, and a bit of bright iron, copper, or silver wire, about 4 inches long, in the right. The melted sugar is next allowed to fall regularly on the tin plate, the wire being used to remove the drop from the lip of the pan. In two or three hours afterwards the drops are taken off with the blade of a knife, and are at once put into bottles or tins. On the large scale, '*confectionery drops*' are moulded by a machine
consisting essentially of two me
covered with hollows. A sheet of
and soft composition, on being p
the rollers, is at once converted into
symmetrical drops, the upper and lo
being moulded by the correspondin
of the upper and lower rollers. S
ING, CONFECTION, ESSENCE, STAIN
tioner's), SUGAR PLUMS.

The following are a few of the
confectionery drops kept in the shop

Drops, Acid'ulated. *Syn.* Ac
Prep. Tartaric acid, ½ oz., dissolved
little water, is added to each lb. of
above; with essence of lemon, oran
gonelle pear, to flavour, as desired.

Drops, Chocolate. *Prep.* Chocol
is reduced to fine powder by scra
added to powdered white sugar, 1 lb
the mixture is made into drops as sh
being taken to avoid heating it a seco

Drops, Cof'fee. *Prep.* A clarified,
trated infusion of coffee, 1 oz., is used
lb. of sugar.

Drops, Fruit. These are prepared a
to the general description. (See abov
flavouring essences (volatile oils or es
lemon, orange, citron, raspberry, j
pear, &c.) not being added until the s
melted, to avoid, as much as possible,
evaporation. The colouring matter
any of the transparent 'stains' us
ployed for cakes, jellies, and confection
this way are made the majority of t
class fruit drops and bon-bons of the
bakers. In some cases the plan is va
adding the clarified concentrated juice,
of the fruit, to the sugar. One va
raspberry and currant (red and black)
are made in this way.

Drops, Gin'ger. *Prep.* From ess
tincture of ginger, as above. An inferi
is made in the way described under Gi
CANDY.

Drops, Jargonelle'. Fruit drops fla
with essence of jargonelle pear (SOLUTIO
ACETATE OF AMYLE).

Drops, Lem'on. Acidulated drops fla
with essence of lemon. They are u
stained with an infusion of turmeric.
above.)

Drops, Pep'permint. From the white
fined sugar, flavoured with English
peppermint or its spirituous solution (es
of peppermint), or with peppermint wate

Drops, Rasp'berry. See FRUIT D
(*above*).

DROPS (Med'icated). *Syn.* GUTTÆ, L.
term is commonly applied to compound
cines that are only taken in small doses
the present time they are almost exclu
confined to empirical and domestic med
The plan of directing liquids to be measur
dropping is objectionable, because the dr
different fluids vary in size, and are als
ther influenced by the size of the bottl

ck, as well as the quantity
:d from. See ESSENCE, and

. *Syn.* ACOUSTIC BALSAM;
E, BALSAMUM ACOUSTICUM,
. of almonds, 1 oz.; lauda-
rpentine, of each, 1 dr.; mix.
, and to allay pain.
benzoin, castor, and opium,
essential oil of assafœtida, 5
ast, and in deafness arising
he organism.
Tinctures of ambergris, assa-
d opium, of each, 1 oz.; tere-
um of sulphur and oil of rue,
In atonic deafness.
:.) Compound spirit of balm,
nonds, 5 drs.; ox-gall, 10 drs.;
20 drops. In cases compli-
lened wax, fetid discharges,

Smith.) Ox-gall, 3 drs.; bal-
r. In fetid ulcerations of the
drops of the above are poured
a piece of cotton wool moist-
is introduced instead. The
; plan.
either alone or diluted with
:iency of the natural secretions
sed in sufficient quantity to
rst passages. See DEAFNESS,

. *Prep.* From white arsenic,
r, 1 oz.; dissolve.—*Dose.* ½ to
twice a day. See SOLUTION
tassa).
lyne. *Syn.* GUTTÆ ANODYNÆ,
ons of acetate and hydrochlo-
are commonly vended in the
:s name.
acid. *Syn.* GUTTÆ ANTACIDÆ,
. C. Hosp.) Liquor of potassa,
dered myrrh, 1 oz.; triturate
thoroughly incorporated, add of
nia, 1 fl. oz., mix well, place the
stoppered bottle, and the next
clear portion. Antacid, tonic,
; useful in various indications.
20 drops, or more, in water.
hyster'ic. *Syn.* GUTTÆ ANTI-
Prep. Cyanide of potassium,
ed spirit, 5 fl. drs.; syrup of
, 3 fl. drs.—*Dose.* 10 drops to
when the attack is expected,
occasionally as required; in hys-
a, gastrodynia, &c.
scorbu'tic. *Syn.* GUTTÆ ANTI-
. *Prep.* 1. Expressed juice of
fl. oz.; salt of tartar, 1 oz.;
er occasionally for a few hours,
days decant the clear.—*Dose.*
, to a teaspoonful, twice a day,
new milk.
of potassa, 4 drs.; ammonio-
, 2 drs.; water, 10 fl. drs.—
lost, in water.

3. (GREEN'S ANTISCORBUTIC DROPS.) Merely a disguised solution of corrosive sublimate. Most of the other 'antiscorbutic' and 'anti-venereal drops' advertised by quacks have a like composition.

Drops, Antiscrof'ulous. *Syn.* GUTTÆ ANTISCROFULOSÆ, L. *Prep.* 1. Iodine, 10 grs.; iodide of potassium, 1 dr.; water, 1 fl. oz.

2. (Augustin.) Chlorides of iron and barium, of each, ½ dr.; distilled water, 1 fl. oz.—*Dose.* 10 to 30 drops, 2 or 3 times a day.

Drops, Antispasmod'ic. *Syn.* GUTTÆ ANTISPASMODICÆ, L. *Prep.* Tinctures of castor, valerian, and assafœtida, of each, 2 drs.; tincture of capsicum and balsam of Peru, of each, 1 dr.; camphor, 20 grs.; acetate of morphia, 3 grs.—*Dose.* 10 to 20 drops, as required.

Drops, Bateman's. See PECTORAL DROPS.

Drops, Battley's. See LIQUOR OPII SEDATIVUS.

Drops, Bitter. *Syn.* GUTTÆ AMARÆ, L.; GOUTTES AMÈRES, Fr. *Prep.* From nux vomica (rasped), 1 lb.; liquor of potassa, ½ fl. oz.; bistre, 1 dr.; compound spirit of wormwood, 32 fl. oz.; digest 10 days, express the tincture, and filter. A most unscientific preparation; said to be tonic and stomachic.—*Dose.* 1 to 8 drops in water or any bitter infusion. In large doses it is *poisonous.*

Drop, Black. *Syn.* ARMSTRONG'S BLACK DROP, LANCASTER'S B. D., QUAKER'S B. D., TOUSTALL'S B. D., BRAITHWAITE'S GENUINE B. D.; GUTTA NIGRA, L. This celebrated preparation was originally prepared nearly a century and a half ago by Edward Toustall, a medical practitioner, in the county of Durham, and one of the Society of Friends. The formula passing into the possession of a relative of his (John Walton, of Shildon), was found among his brother's papers, and, by the permission of Thomas Richardson, of Bishop's Wearmouth, one of his executors, was handed to Dr. Armstrong, who subsequently published it in his work on typhus fever.

Prep. 1. (Original formula.) Opium (sliced), ½ lb.; good verjuice, 3 pints; nutmegs, 1½ oz.; saffron, ½ oz.; boil them to a proper thickness; then add, of sugar, ¼ lb., and yeast, 2 teaspoonfuls. Set the whole in a warm place, near the fire, for 6 or 8 weeks, then place it in the open air until it becomes of the consistence of a syrup; lastly, decant, filter, and bottle it up, adding a little sugar to each bottle. To yield 2 pints of strained liquor.

2. (ACETUM OPII, L.—Ph. U. S.) Opium 8 oz.; nutmeg 1½ oz. (both in coarse powder); saffron, ½ oz.; distilled vinegar, 24 fl. oz.; digest on a sand bath with a gentle heat for 48 hours, and strain; digest the residuum with an equal quantity of distilled vinegar for 24 hours; then put the whole into a percolator, and return the filtered liquid as it passes until it runs clear; afterwards pour on the material *fresh distilled vinegar*, until 48 fl. oz. of filtered *liquor shall be obtained*; in this dissolve sugar,

12 oz., and gently evaporate the whole to 52 fl. oz.

3. (Wholesale.) Opium, 10 oz., and distilled vinegar, 1 quart, are digested together for about a fortnight, and after sufficient repose the clear portion is decanted. This is the form commonly adopted by the wholesale trade in England.—*Dose.* 5 to 10 drops. It is usually considered to be of fully 4 times the strength of laudanum.

Drops, Carmin'ative. *Syn.* GUTTÆ CARMINATIVÆ, L. *Prep.* (Radius.) Oil of mace, 1 dr.; nitric ether, 3 drs.—*Dose.* 6 to 10 drops on sugar; in flatulent colic, &c.

Drops, Cham'omile. See ESSENCE.

Drops, Dalby's. See PATENT MEDICINES (Dalby's Carminative).

Drops, Durande's. *Syn.* GUTTÆ ÆTHERIS TEREBINTHINATÆ, L. *Prep.* (M. Durande.) Rectified sulphuric acid, 3 parts; oil of turpentine, 1 part.—*Dose.* 20 to 30 drops, or more; in the passing of gall-stones.

Drops, Dutch. *Syn.* HAERLEM DROPS, TURPENTINE DROPS; BALSAMUM TEREBINTHINÆ, L. The genuine or imported 'Dutch Drops' is the residuum of the rectification of oil of turpentine. It is also prepared by distilling resin, and collecting the product in different portions. At first a white, then a yellow, and lastly a red oil, comes over. The last is the balsam. The article commonly sold under the name in this country is prepared by one or other of the following formulæ:—

1. Oil of turpentine, tincture of guaiacum, and sweet spirit of nitre, of each, 1 oz.; oils of amber and cloves, of each, 15 drops.

2. Balsam of sulphur, 1 part; oil of turpentine, 5 parts. This last is the form most generally employed. They are all regarded by those who use them as detergent, diuretic, stimulant, and vulnerary.

Drops, Female. *Syn.* EMMENAGOGUE DROPS; GUTTÆ EMMENAGOGÆ, L. *Prep.* (Brande.) Compound tincture of aloes and tincture of valerian, of each, 2 fl. oz.; tincture of sesquichloride of iron, 1 fl. oz.—*Dose.* A teaspoonful in water or chamomile tea; in obstructed menstruation, &c.

Drops, Fit. *Syn.* SOOT DROPS; TINCTURA FULIGINIS, GUTTÆ F., L. *Prep.* From woodsoot, 2 oz.; sal-ammoniac, 1 oz.; salt of tartar, ½ lb.; soft water, 4 lbs.; digest a week and filter. Reputed antispasmodic, and also useful in scurvy and certain skin diseases.—*Dose.* A teaspoonful or more, occasionally, in water.

Drops, Golden. *Syn.* DE LA MOTTE'S G. D.; BESTUCHEFF'S NERVOUS TINCTURE; GUTTÆ AUREÆ, L.; ELIXIR D'OR, GOUTTES D'OR DU GÉNÉRAL LAMOTTE, Fr. *Prep.* 1. (Original.) Chloride of iron (obtained by distilling iron pyrites with twice its weight of corrosive sublimate), 3 oz.; alcohol, 7 oz.; expose the mixture in a closely stoppered bottle to the rays of the sun until it becomes decoloured.

2. Chloride of iron, 1 part; alcohol and ether, of each, 3 parts. These drops have the remarkable property of losing
colour in the sun, and recoveri
shade. They are taken in gu
driasis, and nervous complaints
from 10 to 60 drops.

Drops, Hooping-Cough. *Syn.*
PERTUSSICÆ, L. *Prep.* 1 (
Tincture of assafœtida and comp
of camphor, of each, ½ fl. oz.; co
ture of bark, 5 fl. oz.—*Dose.* A
or 3 times a day.

2. (Potestates Succini.) Oil of
carbonate (not sesquicarb.) of am
strongest rectified spirit (alcohol),
3 or 4 days, and decant the
Dose. 10 drops to 1 dr., appli
tion.

Drops, Infantile. Several an
native, and absorbent preparation
by this name, will be found und
&c.

Drops, Jes'uits'. *Syn.* ELIXI
REUM, L. *Prep.* 1. Gum guai
balsam of Peru, 4 drs.; root of
oz.; rectified spirit of wine, 1
for 14 days.

2. (Quincy.) Copaiba, 1 oz.; g
2 drs.; oil of sassafras, 1 dr.;
½ dr.; rectified spirit, 5 fl. o
week.

3. (Walker's.) Copaiba, 6 oz.
cum, 1 oz.; chio turpentine and
of each, ½ oz.; cochineal, 1 dr.; r
1 quart; digest a week. See
BENZOIN (Comp.).

Drops, Kœchlin's. *Prep.* (Au
lution of ammonio-chloride of cop
cury, 1 fl. dr.; water, 10 fl. drs.
venereal affections, scrofula, &c.—
spoonful after each meal.

Drops, Lav'ender. *Syn.* RED DE
LAVENDULÆ, L. The same as co
ture of lavender.

Drops, Life. *Syn.* SALMON'S DR
GUTTÆ VITÆ, L. *Prep.* Tinct
8 fl. oz.; antimonial wine and w
1 lb.; opium, 3 oz.; saffron, ½ oz.
camphor, and nutmegs, of each, 2
for 10 days and filter. Anodyne
retic.—*Dose.* 20 to 60 drops.

Drops, Mercu"rial. *Syn.* GUTT
GYRI BICHLORIDI, L. *Prep.* 1. B
mercury, 2 grs.; hydrochloric ac
rectified spirit and distilled wat
½ fl. oz.—*Dose.* 12 to 20 drops.

2. Bichloride of mercury, 2 grs.
niac, 3 grs.; compound decoction
rilla, 2 fl. oz.—*Dose.* A teaspoonful

3. (Sir A. Cooper.) Corrosive
1 gr.; dilute hydrochloric acid, ½ d
and add, tincture of bark, 2 fl. oz.-
the last. They are all taken 2
daily, as alteratives in scrofula, syp
&c. It should not be measured
spoon.

Drops, Norris's. An aqueous

mixed with spirit of wine, and

l'gic. *Syn.* TOOTH-ACHE DROPS;
ALGICÆ, L. *Prep.* 1. (Dr.
(in fine powder), 1 dr.; sweet
fl. drs.; agitate together occa-
hour.
and.) Powdered opium and
ch, 10 grs.; oils of cloves and
, 1 dr.; highly rectified spirit
ther, of each, ½ fl. oz.
L.) A saturated ethereal solu-
r, to which a few drops of liquor
added.
E. Griffith.) Wine of opium,
dyne, and oil of peppermint,
Used as a friction on the cheek
l as applied to the teeth.
A concentrated ethereal tinc-
r and pellitory.
.) Creasote, 6 drs.; rectified
tincture of cochineal, 2 drs.; oil
½ dr.
bove are applied to the tooth
hair pencil, or a little wad of
wool is moistened with them,
or against the tooth.
eral. *Syn.* BATEMAN'S P. D.;
RALES, L. *Prep.* 1. Paregoric,
cture of castor, 4 fl. oz.; lau-
.; tincture of saffron or of cochi-
oil of aniseed, 15 drops.
oz.; oil of aniseed, 1 dr.; cam-
cochineal, 1½ dr.; opium, ¾ oz.;
proof spirit, 1 gal.; digest for a

ll. of Pharm.) Camphor, catechu,
ium, and red sanders wood, of
oil of aniseed, 4 fl. drs.; proof
wine-gallons; digest 10 days,
ose. A teaspoonful, or more, in
hoarseness, &c., assisted by an

mat'ic. *Syn.* GUTTÆ RHEUMA-
ep. 1. Iodide of potassium, 1 dr.;
iacum, 2 fl. oz.; dissolve.—*Dose.*
ops. In both chronic and occa-
atism, assisted with the copious
juice.
dius.) Bisulphuret of carbon and
h, 2 fl. drs.—*Dose.* 6 to 12 drops,
in milk.
r.) Bisulphuret of carbon, 1 fl. dr.;
drs.—*Dose.* As No. 2. The last
orific, alterative, resolvent, and
e, and, besides rheumatism, have
ith advantage in amenorrhœa, in
ous affections, in glandular swell-

sseau's. See WINE OF OPIUM
ation).
'ative. *Syn.* GUTTÆ SEDATIVÆ, L.
s of acetate and hydrochlorate of
ck drop, Rousseau's drop, and
per spir sedativus, are frequently
e name by the druggists. The anti-hysteric drops (*antè*) is also an excellent sedative.

Drops, Spilbury's. *Prep.* 1 (Dr. Paris.) From bichloride of mercury, gentian root, and dried orange peel, of each, 2 drs.; precipitated sulphuret of antimony and red sanders wood, of each, 1 dr.; proof spirit, 16 fl. oz.; digest ten days, and strain.

2. Levigated crocus metallorum ('crocus of antimony'), 6 drs.; corrosive sublimate, 45 grs.; red sanders, ½ dr.; gentian root and dried orange peel, of each 2 drs.; brandy (or equal parts of rect. sp. and water), 16 fl. oz.; digest as before.—*Dose.* 5 to 30 drops; as an anti-scorbutic, &c.

Drops, Steel. See TINCTURE OF SESQUICHLORIDE OF IRON.

Drops, Ton'ic. *Prep.* (Collier.) Elixir of vitriol, 2 fl. dr.; tincture of calumba, 6 fl. drs. A teaspoonful three times daily, in a wine-glassful of cold water.

Drops, Torrington's. See TINCTURE OF BENZOIN (Comp.).

Drops, Van Swieten's. An aromatised solution of corrosive sublimate.

Drop, Ward's White. *Prep.* From quicksilver, 4 oz.; nitric acid, 16 fl. oz.; dissolve, add sesquicarbonate of ammonia, 7 oz.; evaporate and crystallise; then dissolve the resulting salt by the heat of a sand bath, in 4 times its weight of rose-water. Very poisonous.—*Dose.* 5 to 15 drops, as an antiscorbutic, antivenereal, &c.

Drops, Worm. *Syn.* GUTTÆ ANTHELMINTICÆ, G. VERMIFUGÆ, L. *Prep.* 1. Creasote, 1 dr.; oil of turpentine, 7 fl. drs.—*Dose.* A teaspoonful, 3 or 4 times a day.

2. (Peschier.) Oil of male-fern, 3 fl. drs.; rectified oil of turpentine, 5 fl. drs. As the last; in tape-worm.

3. (Schwartz'.) Barbadoes tar, 1 fl. oz.; tincture of assafœtida, 1½ fl. oz.—*Dose.* 30 to 40 drops, three times a day; in tape-worm.

DROPS (Scouring). *Prep.* 1. Oil of turpentine and oil of lemons, equal parts. Both of the ingredients should have been recently distilled or rectified.

2. Oil of lemon bottoms, 1½ lb.; oil of turpentine, 1 quart; mix well, and distil by the heat of a sand bath, until 3 pints have come over, or as long as the distillate is clear, pale, and sweet. *Used* to remove paint, grease, &c., from cloth.

DROPSY. *Syn.* HYDROPS, L. An unnatural collection of aqueous fluid in any part of the body. Dropsy has received different names, according to the part of the body affected by the disease. When it occurs in the cellular membrane it is called ANASARCA; when in the cavity of the abdomen, ASCITES; in the cavity of the cranium, HYDROCEPHALUS; in the scrotum, HYDROCELE; in the uterus, HYDROMETRA; *and in the chest,* HYDROTHORAX. *Dropsy is mostly* a symptom of extreme de-*bility and* a broken-down constitution, and frequently follows lengthened attacks of exhausting chronic diseases.

The treatment of dropsy, perhaps, more than any other disease, depends upon the circumstances with which it is connected, and, more especially, upon those which have caused it. The acute inflammatory forms of dropsy generally require depletion. In most other cases, tonics may be advantageously administered. To promote the absorption of the accumulated fluids, diuretics are commonly resorted to. Confirmed dropsy (especially HYDROCEPHALUS and HYDROTHORAX), occurring in patients either much debilitated by previous disease or of a bad habit of body, is seldom curable.

DROWNING. The cause of death from submersion in water is the entire seclusion of air from the lungs, by which the aëration of the venous blood is prevented. In consequence of this deprivation of air, venous blood circulates through the arterial system, whilst the pulmonary vein ceases to convey oxygenated blood to the heart. Under ordinary circumstances, in the course of 4 or 5 minutes after the access of air has been cut off, life becomes extinct. Many cases have, nevertheless, occurred of persons being submerged for 15 or 20 minutes, and even longer, and where perfect insensibility has existed, in which recovery has taken place.

Prev. The specific gravity of the human body is less than that of water, so long as the lungs are partially filled with air; and this difference is sufficient to keep the body floating with the mouth and nostrils free for respiration, provided the face is turned upwards by throwing the head back on the shoulders, by which the weight of the head is sustained by the water. When a person throws himself into the water, the body rises rapidly to the surface and assumes nearly the erect position, the upper part of the head, down to a little below the eyes, remaining above the surface of the water. This arises from the greater density of the legs and thighs compared to that of the chest, which acts as a species of float or buoy to the rest of the body. In this situation the head may be thrown back, so that the face may form the exposed portion, as before mentioned, when respiration may be carried on without inconvenience in still water, and regularly, but sufficiently, so as to sustain life for some time, even in a rough sea. The adoption of this simple precaution would have saved thousands of valuable lives.

Another point which should be remembered by every person in danger of drowning is, that there is always a considerable amount of residual air in the lungs, in a nearly deoxidised state, and that if this air is expelled by two or three forced inspirations, and a deep inspiration is then taken, a larger quantity of vital air will be introduced into the lungs, and the blood will continue aërated for a proportionally longer time; and, consequently, a longer period will elapse before another insp
be required. If we prepare ourselv
two or three forced inspirations, an
a full inspiration, we may remain
minutes before a second attempt at
need be made. This is the plan ad
pearl fishers, and other divers who
able for remaining beneath the sur
water for some time. A person in
shipwreck, or expecting immediate
in any other situation, should hav
to this expedient, which would p
dreadful effects of attempting
whilst under water.

Treat. The first object is the
the animal heat. For this purpos
clothes should be removed, and the b
being well dried, surrounded with
In the absence of a warm-air bath,
may be laid between well-heated bl
bottles of hot water applied to the
armpits. Gentle friction with wa
or the hands should also be assid
ployed. Meanwhile attempts should
to excite respiration artificially; and
apparatus is at hand, slight shocks of
city should be kept up at the same ti
the appearance of returning life, such a
or convulsive twitching, a vein may be
The throat may be tickled with the
a feather, to excite vomiting, and a t
of warm water administered. If the
swallowing exists, a table-spoonful of w
or brandy-and-water may be given.
no symptom of returning animation
these means of recovery should be p
for three or four hours.

In the treatment of this species of
nasal stimulants, as ammonia, aromati
&c., should be avoided, as well as the i
of tobacco smoke, both of which ha
found highly prejudicial. The pra
holding the body with the head dow
which is sometimes adopted by the vu
ignorant, under the idea of allowing th
to run out by the mouth, is still
gerous and absurd. The supposition th
is inhaled by drowning persons, instead
is perfectly fallacious. The peculiar me
of the glottis, or upper portion of th
pipe, is such as to prevent, by the sp
closure of the epiglottis, the entrance
than a very trifling and accidental qu
water, which is altogether too insignif
produce any very injurious effects.
PHYXIA.

DRUGS. Substances used in medic
by druggists, and compounded by apot
and physicians. Our continental neig
wiser than ourselves, not merely requ
persons engaged in selling and dis
drugs and pharmaceutical preparatio
be fully qualified by previous educat
training for the task, but also that the
articles they sell and use shall be cons
pure and of the proper quality. In th

is subject has also engaged
government and legisla-
t of the 26th June, 1848,
pointed to examine the
articles of this class, before
ass the Customs for home
opy of the order addressed
d other officers under this
and will be useful to the
; to establish a standard
of the substances named
nated.

EPARTMENT, *June 4th*, 1853.

are to be entitled to entry when
to afford the per-centages as

ic extract.
peculiar bitter resin, and 3% of

f pure quinine, or 2% of the several
chona, quinidine, aricine, &c.
resin.
acid.
cynthine.
erine.

and 6% *volatile oil.*
mboge resin, and 2% of *gum.*
guaiacum resin.
of *resin*, and 18% of *gum.*
p resin.
n, and 50% of *gum.*
kia.
le matter.
's, 80% of *gum*, and 30% of *volatile*

scammony resin.
atter.

wers, barks, roots, extracts, &c.,
st be, when imported, in perfect
ent collection and preparation as

chemical preparations, whether
se, used in medicine, to be pure,
tence and strength, as well as of
nformably with the standard au-
Act; and must, in no instance
s of moisture or water of crystal-

oils, and expressed oils used in
and of the standard sp. gr. noticed
ensatories named in the above Act.
Medicines" are by law subject to
as other medicinal preparations,
d to pass the Custom-house for
must be rejected and condemned,
iner is satisfied, after due investi-
and safe to be used for medical

examiner to the collector to be
s.

JAMES GUTHRIE,
Secretary to the Treasury.

IGHT. See LIGHT (Arti-

S. See ABSTINENCE, IN-

ter's). *Prep.* 1. Litharge
paste with drying oil. For

copperas and drying oil; as

of lead and drying oil. The
e colours.
ication.

lian, and Russian, admissible.

4. From white copperas and sugar of lead, of each, 1 lb.; pure white lead, 2 lbs. For 'whites,' and opaque light colours, grays, &c. Dryers are employed, as the name implies, to increase the drying and hardening properties of oil paints. A little is beat up with them at the time of mixing them with the oil and turpentine for use.

DRY'ING. See DESICCATION, &c.

DRY'ING-OIL. See OILS.

DRY-ROT. A peculiar disease that attacks wood, and renders it brittle and rotten. It is generally caused by dampness and the subsequent development of the spores of fungi, particularly those of *Merulius lacrymans* and *vastator* and *Polyporus destructor.* The dry-rot principally attacks 'ill-seasoned' timber, and more particularly that of ships and badly ventilated buildings.

Prev. Various means have been proposed to prevent the attacks of dry-rot, and to arrest its progress when it has commenced, among which the process called 'KYANIZING' (Kyan's patent) is that most generally known and most extensively adopted. It consists in immersing the timber in a bath of corrosive sublimate. The process termed 'PAYNIZING' (Payne's patent) consists in first filling the pores with a solution of chloride of calcium, under pressure, and next forcing in a solution of sulphate of iron, by which an insoluble sulphate of lime is formed in the body of the wood, which is thus rendered nearly as hard as stone. Wood so prepared is now largely employed in our public works and railways. Sir W. Burnett's process (patented in 1836) consists in impregnating the timber with a solution of chloride of zinc. Mr. J. Bethell's process (patented in 1838) consists in thoroughly impregnating the wood with oil of tar containing creasote and a crude solution of acetate of iron, commonly called 'pyrolignite of iron.' The impregnation is effected in a strong cylindrical vessel, connected with a powerful air-pump, so that in the first instance, a vacuum being formed, and subsequently a pressure of several atmospheres applied, the liquid may as much as possible be forced into all the pores of the wood. The above processes for 'seasoning' preserve the timber not only from dry-rot, but from the influence of the weather and the attacks of insects and worms.

DUB'BING. *Prep.* 1. By boiling the waste cuttings of sheep-skins in crude cod oil. 2. Black resin, 2 lbs.; tallow, 1 lb.; crude cod oil or train oil, 1 gal.; boil to a proper consistence. *Used* by the curriers to dress leather, and by shoemakers and others to soften leather, and to render boots and shoes waterproof.

DUCK. See POULTRY.

DUCTIL'ITY is the property of being drawn out in length without breaking. See METALS.

DULCAMA'RA. See NIGHTSHADE (Woody).

DUMB'NESS. *Syn.* APHONIA, L. As speech is an acquired and imitative faculty, persons who are either born deaf or become so in early infancy are also, necessarily, dumb. The first step in treating dumbness must therefore be directed to the removal of the deafness on which the imperfection rests. The exertions of modern philanthropists have, however, been so far successful in such cases, as to enable the deaf-mute to converse with those around him by signs. Those interested in the subject may consult an admirable treatise on 'Deaf-dumbness,' by M. E. Hubert-Valleroux, of which an excellent translation appeared in the 'Medical Circular,' vol. ii, for 1853. See DEAFNESS.

DUNG'ING. *Syn.* CLEANSING. One of the principal processes in the arts of calico printing and dyeing, its object being to free the cloth from loose matters, which would interfere with the dyeing. After the thickened mordants have been applied to the fabric, and properly fixed, it is necessary to remove the now useless thickening matter, together with the excess of mordant, which has not come into actual contact with the cloth. Formerly, a bath formed of cow-dung, diffused through hot water (130° to 212° Fahr.) was always used to wash away these loose matters; but now various manufactured substances are successfully employed for the purpose. The best dung substitutes are the arsenite and arseniate of soda, the silicate of soda, and phosphate of lime. Experience proves that, in the case of these substitutes, a final wince in cow-dung before dyeing is advantageous. A process very similar to 'dunging' is employed after dyeing, to clear and give purity to the undyed parts. This subsequent process is distinguished by the term 'clearing.' Cow-dung has been used in 'clearing' operations, but its employment is not to be recommended. Bran scalded and mixed with water is employed for certain goods, but bleaching powder is the most generally used 'clearing agent.'

DUTCH LIQ'UID. See OLEFIANT GAS.

DYE'ING. The act of tinging or colouring absorbent materials, by impregnating them with solutions of colouring matters or dye-stuffs. The colouring matters which impart their tints without the intervention of other substances are called 'substantive colours;' while those which require such aid are called 'adjective colours.' The bodies employed to fix and develop the latter class are called 'mordants.' The exact way in which dye-stuffs act upon fibrous materials has not yet been investigated as fully as it deserves; the generally received opinion is that the fibre has a chemical affinity for the colouring matter in the case of substantive dyes, and likewise for the mordant, which, in its turn, has an affinity for the colouring matter of adjective dyes. Another opinion is that the fibres have pores, which, when expanded by heat or chemical agents, admit particles of colouring matter. However this may be, it is certain that different materials 'take' dyes in different proportions; thus, silk and wool take the coal-tar dyes in the most perfect
cotton requires the interventio
powerful mineral or animal mor
takes the colouring matters of m
so well that the deepest tints c
produced. SILK and COTTON a
greater difficulty, whilst LINEN s
disposition to take dyes. The op
take place in dyeing are 'mordant
'dunging,' 'dyeing,' and 'clearin
of these operations is noticed und
After the fabric has been mor
generally hung up in a room thr
current of steam and air is pass
of which the union between the
mordant is quickened very consid
exposure to moist air is the step
to which the term 'ageing' is
operations of 'dunging' and '
noticed above (see DUNGING).
proper, which follows the 'dungi
by running the fabric through th
the dye-stuff, the colour being
or less by the nature of the
Under the names of the differe
means used to dye such colours
described. See BLACK DYE, BL

The following particulars re
production of the more common
prove interesting to the reader
requires some general informatio
ject:—

BLACK is usually produced b
galls with an iron mordant. C
silks are dyed with logwood an
being used as a mordant. The
dyed black on a blue ground. W
are first dyed blue with indigo, a
with sumac, logwood, and green
peras. Cotton and linen goods a
in a very similar manner.

BLUE is commonly produced
either in the form of sulphate o
solution. Prussian blue, with a
or tin as a mordant, gives a very
blue. Of late several blues of
have been produced from coal-ta

RED is obtained in various sh
cochineal, safflower, lac-dye, ma
wood, with a tin mordant.

PURPLE. Until the last few
was dependent for his purples
cudbeer, but he has now at his
magnificent series of aniline, or co
ranging from the most delica
'mauve,' to the full crimson-pur
'magenta.' See PURPLE DYE.

YELLOW. The most importa
are made from quercitron, fus
arnotto, and French and Persian
further information, see BLEACH
PRINTING, &c.

DYER'S SPIRITS. See TIN

DYES. See DYEING, and the
principal colours.

DYE-STUFFS. The colour

are so called. The more im-
n are noticed under the re-

Y. *Syn.* BLOODY FLUX; DY-
A disease arising from inflam-
nucous membrane of the large
characterised by stools con-
of blood and mucus, or other
, accompanied with griping of
. followed by tenesmus. There
re or less fever, and the natural
er retained or discharged in
ills (*scybala*). The common
lisease are marsh miasma, im-
essive exhaustion, and fatigue,
exposure to the cold and damp
er a hot day.

common dysentery of this
ally gives way to gentle aperi-
or salts-and-manna), to cleanse
llowed by mild opiates or mor-
irritation. The chronic symp-
requently hang about for some
combated by mild tonics and
ers (bark, calumba, cascarilla).
chalybeates (ammonia-citrate of
f iron, wine of iron, saccharine
ron) will be found useful during
Throughout, the diet should
nutritious.

ious dysentery, of camps and hot
severe and often fatal disease, in
ceding symptoms are complicated
nt or typhoid fever. Its treat-
ous and difficult, and depends
udiciously meeting the several
they develop themselve. Aperi-
etics, and nauseants, followed by
he remedies generally relied on.
ymptoms must be treated accord-
nflammatory or putrid tendency.
of the disease frequently gives
ic diseases of the abdominal vis-
&c. It is regarded by some as
at without sufficient reason.

IORRHŒ'A. See MENSTRUATION.

IA. [L.] *Syn.* DYSPEP'SY, IN-
This complaint pervades every
ty, and is, perhaps, of all others,
eral. Few indeed are there who
e it, in one or other of its forms.
a symptoms of dyspepsia are—
etite, sudden and transient dis-
e stomach, frequent eructations,
tomachic pains, occasional vomit-
quently, costiveness or diarrhœa.
he head is affected, and dimness
ble vision, muscæ volitantes, and
o, are experienced, along with a
other symptoms, depending on a
of the functions of the nervous

s of dyspepsia are numerous. In
nks of society it is a common
of over-indulgence in the luxuries
f late hours, or of the want of proper exercise, both of body and mind. In the studious, and those who lead a sedentary life, it is usually caused by excessive mental exertion or anxiety, or by the fatigues of business, and the want of sufficient bodily exertion and of pure air. In the lower orders of society it generally results from inebriety, or a deficiency of proper food and clothing, bad ventilation, &c.; and is not unfrequently occasioned by the physical powers being over-taxed, especially soon after meals.

The treatment of dyspepsia depends less on medicine than on the adoption of regular habits of life. Moderation in eating, drinking, and the indulgence of the passions; early rising, due exercise, and retiring to rest at an early hour, will do much to restore the tone both of the stomach and nerves. Excessive study and mental exertion should be avoided, and recourse should frequently be had to society and amusements of a lively and interesting character. If the bowels are confined, mild aperients should be taken, and if diarrhœa is present, antacids and absorbents may be had recourse to with advantage. The stomach may be strengthened by the use of mild bitters, tonics, and stimulants, and sea bathing, or the shower or tepid bath, may be taken, when convenient, to strengthen the nervous system. When dyspepsia is a secondary or symptomatic disease, the cause should be sought out, and the treatment varied accordingly. Among the aperient medicines most suitable to dyspepsia may be mentioned—Epsom salts, phosphate of soda, and Seidlitz powders, each of which should be taken largely diluted with water. An occasional dose of the '*Abernethy Medicines*' (which *see*) has also been recommended. Among antacids, are the bicarbonates and carbonates of potassa and soda, either of which may be taken in doses of half a teaspoonful dissolved in water; or if the spirits are depressed, one or two teaspoonfuls of spirit of sal-volatile will be more appropriate; and in cases accompanied by diarrhœa, a little prepared chalk. As bitters, the compound infusion of orange peel, or of gentian, are excellent. As tonics, small doses of bark, or of sulphate of quinine, to which chalybeates may be added, if there is pallor of countenance, or a low pulse, with no disposition to fever or headache.

When dyspepsia is complicated with hysteria, hypochondriasis, or chlorosis, the treatment noticed under those heads may be conjoined to that above recommended. When it depends on constipation, or a deficiency of bile, the mildest and most effective of all remedies will be found supplied in inspissated ox-gall. "In all cases of incipient constipation, ox-gall is a remedy of undoubted efficacy; and even in protracted cases, when hope has almost fled—but where evidences of strangulation are not unequivocally manifested—it should never be *omitted by the practitioner.* In habitual or *chronic constipation,* accompanied by indigestion, clay-coloured stools, and a feeling of oppression after food has been taken, it acts with almost specific certainty. When, however, the liver begins to assume its healthy action, its employment should be discontinued, and it will then produce all the symptoms of regurgitation of bile into the stomach. This state will be readily recognised as a favorable omen of returning power." (Dr. Allnatt.)

DYSPNŒ'A. Difficulty of breathing. It is generally symptomatic of some other affections. When it occurs in persons of a nervous or irritable habit of body, perfect quiet, a semi-recumbent posture, fresh air, and some small doses of ether, ammonia, or opium, will generally effect a cure. Those of a full habit require aperients and depletion. To prevent attacks of the kind, excess in eating and drinking, and the use of stimulants, should be avoided.

DYSU"RIA. [L.] *Syn.* DYS'URY. Difficult urination. It is generally symptomatic of disease of the kidneys, bladder, or urethra. The treatment depends on the exciting cause.

EAR (Inflamma'tion of). *Syn.* OTITIS, L. This affection, when it attacks the internal part of the ear, is generally accompanied with confusion of sound, deafness, and more or less fever. It is most frequent among children, and is commonly produced by exposure to draughts of cold air, and, occasionally, by foreign matters, as cherry-stones, insects, &c., having got into the external ear. In such cases, the removal of the offensive matter, and due attention to warmth and cleanliness, with a dose of laxative medicine, will be all the treatment required. The pain may generally be relieved by throwing warm water into the ear by means of a syringe, and fomenting the surrounding parts with decoction of poppy-heads and chamomile flowers. Should this treatment not succeed, a drop or two of laudanum, with one drop of oil of cloves and a little oil of almonds, may be dropped in the ear, and a piece of cotton wool introduced afterwards. Cases of acute inflammation of the internal ear are occasionally met with in adults, which assume a very serious character, and demand the most careful treatment. See DEAFNESS.

Earache. Pain in the ear may arise from various causes, amongst which, in the absence of organic disease, cold, and that peculiar derangement of health popularly called 'nervousness,' are the most common. In the one case, the proper remedy is warmth; in the other, the attention should be directed to the restoration of the body to the healthy standard.

EARTHS. In *chemistry*, a group of metallic oxides. The principal earths are baryta, strontia, lime, magnesia, alumina, berylla or glucina, yttria, zirconia, and thoria. The first four are termed ALKALINE EARTHS; the remainder, together with the oxides of the very metals erbium, terbium, norium, cerium, lanthanum, and didymium, consti
EARTHS PROPER.

The term *earth* was very loosely
the older chemical and pharmaceuti
and the practice is still common
vulgar at the present day. Thus,
EARTH (chalk); ALUMINOUS E., ARGI
E. (alumina); BOLAR E. (bole);
phate of lime); FULLER'S E. (
clay); HEAVY E. (baryta); JAPAN E.,
JAPONICA (catechu); SEALED E.
are names even now frequently
both in trade and in books.

EAU. (Fr.) Water. This word,
English synonym, is applied to num
stances, differing in their composition,
properties, and uses, of which the
are a few useful examples:—EAU DOUC
or river water; EAU DE MER, sea
water; EAU DE FONTAINE, EAU DE
spring water; EAU DE PUITS, well
water; EAU DE RIVIÈRE, river wate
DISTILLÉE, distilled water; EAU DE
rose water; EAU DE VIE, brandy;
COLOGNE, Cologne water; EAU D'H
Hungary water; EAU BÉNITE, holy
EAU FORTE, aquafortis; EAU DE SAVON
suds; EAU DE SENTEUR, scented water,

Eaux, in perfumery, are solutions
fragrant essential oils in spirit, as eau
logne, eau de bouquet, &c.; or they are
waters, largely charged with the odorous
ciples of plants, as eau de rose, eau de
d'oranges, &c.

Eaux, of the liqueuriste, are arom
spirits or cordials.

Eau Medicinales are either simple
solutions (HYDROLÉS, HYDROLATURES,
TIONS PAR L'EAU), or distilled water
DISTILLÉES); or they are vinous or al
tinctures or solutions of essential oils
matics, or more active drugs. See CO
HAIR DYES, PERFUMERY, SPIRITS, TINC
WATERS, &c.

EB'LANINE. The yellowish-red,
lisable, solid substance, which is left
in the retort, when wood spirit is
from quicklime. It is insoluble in wa
sublimes without fusion at 273° Fahr.

EB'ONY. The wood of the *Diospyrus
oxylon*, an East Indian tree, of the
order *Ebenaceæ*. Two other specie
same genus, namely, *Diospyrus Eb
D. Ebenaster*, yield respectively M
EBONY and the BASTARD EBONY of
Pale-coloured woods are stained in
of ebony (FACTITIOUS EBONY), by
them with or steeping them in a st
coction of logwood or of galls, and, w
washing them over with a solution of
or acetate of iron. They are then r
clean water, and the process is repe
required. The wood is lastly polished
nished.

EBRIETY. See INTOXICATION.

EBULLI'TION. The state of b

luid arising from its rapid our by heat. Ebullition liquids at very different temperatures being called s.³ Under the same cirling-points are constant, hem the chemist is often liquids which much re- The boiling-point of the owever, vary considerably cumstances. The causes on are increased or diminressure, the greater or less and the character of the Thus, boiling water is grees when the barometer ier, or at the top of a hill, rometer is higher, in fine ottom of a valley or mine. nple and beautiful experif the effect of diminished ng the boiling-point of a ater is made to boil for a ask or retort placed over a has been expelled, and the from the neck. A tightly inserted, and the lamp at t withdrawn. When the may be renewed at pleable time by the affusion of by condensing the vapour partial vacuum. Liquids in 30° to 140° lower than their oints when heated *in vacuo*. table furnishes very exact ting the effect of increasing boiling-point of water:—

-points of Water at different Ir. C. GREVILLE WILLIAMS.

neter hes.	Boiling-point °Fahr.	Barometer Inches.
676	200	23·454
·047	201	23·937
·421	202	24·441
·803	203	25·014
·196	204	25·468
·593	205	25·992
·992	206	26·529
·407	207	27·068
·822	208	27·614
·254	209	28·183
·687	210	28·744
·124	211	29·331
·576	212	29·922
·030	213	30·516
·498	214	31·120
·965	215	31·730

contained in a deep vessel is in a shallow one, on account sistance in the one case than escape of the steam. *It is luids boil at a lower temperature and more quietly in vessels with rough and spicular surfaces, than in those with smooth or polished ones.* The boiling-point of water, as marked on the scale of the thermometer, is 212° Fahr., but in glass vessels, under common circumstances, it varies from 212·54° to 215·6°; whilst in perfectly pure and smooth glass vessels water may be heated to 221° Fahr. without boiling. That the elevation of the boiling-point in this case is due to the nature of the surface, may be at once demonstrated by throwing into water, about to boil in a glass matrass, a little iron filings or coarsely powdered glass, when ebullition will commence with almost explosive violence, at the same time that the temperature of the fluid will sink about 2° Fahr.

The boiling-point of water contained in ordinary vessels may be raised considerably above 212° Fahr., by the addition of saline matter, as will be seen in the following table, extracted from Mr. C. G. Williams's excellent 'Handbook of Chemical manipulation:'—

TABLE II.—*Boiling-points of Saturated Solutions of various Salts at the ordinary Atmospheric Pressure.* By C. G. WILLIAMS.

Name of Salt.	*Boiling-point.*
Chloride of calcium	. 355° Fahr.
Acetate of soda	. 256 "
Nitrate of soda	. 246 "
Sal-ammoniac	. 236 "
Common salt	. 224 "
Cream of tartar	. 214 "

The above solutions are suitable for chemical baths. With the exception of the first, they furnish in their boiling-points temperatures, as nearly as can be obtained, 10° above each other. They were chosen by Mr. Williams because, in 'fractionating' volatile substances, it is usual to separate the distilled products by differences of temperature equal to 10° Fahr. In long operations it is found inconvenient to employ a saturated saline solution for a bath (by which the highest temperature would be obtained), as the constant evaporation of the water induces the crystallisation of the salt. It is hence usual to keep it considerably below that point.

The following table, compiled chiefly from the pages of Dr. Miller's 'Elements of Chemistry,' gives the boiling-points of several interesting substances.

TABLE III.—*Boiling-points of various Liquids at the ordinary Atmospheric Pressure.*

Name of Substance.	*Boiling-point.*
Liquid carbonic acid	. —108° Fahr.
Liquid sulphurous acid	. + 17·6 "
Chloric ether	. 51·9 "
Aldehyd	. 69·4 "
Ether	. 94·8 "
Bisulphuret of carbon	. 118·5 "
Bromine	. 145·4 "

Name of Substance.	*Boiling-point.*
Wood spirit	149·9 Fahr.
Alcohol (sp. gr. ·815) . .	173·1 „
Benzol	176·8 „
Dutch liquid . . .	184·7 „
Acetic acid . . .	243·1 „
Sulphur (melted) . .	609· „
Mercury	662· „

EBUL'LIOSCOPE. *Syn.* EBULLITION ALCOHOLOMETER, THERMO-ALCOHOLOMETER. "This instrument is essentially a thermometer, and its application to alcoholometry is based upon the fact that the boiling-point of a spirituous liquid is scarcely altered by the presence, within certain limits, of the substances which may be dissolved in it, and which, by increasing its specific gravity, render the ordinary alcoholometers or hydrometers useless for the purpose of indicating its alcoholic richness. The ebullioscope was invented by the Abbé Brossard-Vidal, of Toulon, and in its original form consisted of a spirit-lamp surmounted by a small boiler, into which a large cylindrical glass bulb was plunged, having an upright stem of such calibre that the quicksilver contained in them, by its expansion and ascent when heated, raised before it a little glass float in the stem, which was connected by a thread with a similar glass bead, hanging in the air. This thread passed round a pulley, which, turning with the motion of the beads, caused an index to move along a graduated circular scale, which represented on its face the per-centage of absolute alcohol in spirituous liquors of different boiling-points. This form of the apparatus being found inconvenient and liable to get disarranged, various improvments were made in it by MM. Conaty, Lerebour, and others. The modification of the instrument now in use, and known as Field's PATENT ALCOHOLOMETER, was made by the late Dr. Ure, and can scarcely be improved on. It consists of a thermometer having a very minute bore and a large bulb, similar to that employed to determine the height of mountains from the boiling-point of water, but instead of thermometric degrees being marked upon the scale the per-centage under proof is placed on the left-hand side of the stem, and the per-centage content of proof spirit on the right-hand side. These commence at 178·5° Fahr., the temperature at which 'proof spirit' boils, and which here forms the bottom of the scale. The succeeding numbers are based upon the boiling-points of mixtures of alcohol and water. The little boiler being charged, and about a teaspoonful of salt (35 grs.) being added, to prevent loss of alcohol by evaporation, the thermometer is set in its place, and the spirit-lamp lighted. When the mercury begins to rise out of the bulb of the thermometer, the 'damper-plate' is pushed in a little way, to moderate the heat. The eye is now kept steadily on the instrument, and as soon as the liquor boils freely, and the mercury becomes stationary in the stem, t
is carefully noted, and the damper
home to extinguish the flame.

"The ebullioscope is adjusted
boiling-point of water under an
pressure of 29·5 inches. When
is either higher or lower, bot
alcohol boil at a somewhat diffe
ture, to meet which a baromet
is attached to the thermometer
a small subsidiary scale. It is
cessary, prior to commencing the
testing any liquor, to charge th
with pure water only, and to fi
meter in its place. When the
freely, the mercury becomes stat
stem, exactly opposite the true
indication at the time. Should t
the line 29·5, no correction will
but should it stand at any other
below, then the various boiling-p
reference to that boiling-point
latter case, the boiling-point of
the barometrical indicator must
the boiling-point of the liquid
when opposite the line —29·5 wi
true strength. Thus:—the ba
at 30 inches, and the indicati
point being 72 u. p., 30 on the i
be placed against 72 u. p. on
meter, when against the line o
seen 69·6 u. p., the real strength
tested.

"When a spirit is stronger th
proof,' its boiling-point varies
its alterations of strength to re
lioscope of much practical value
applicable to the stronger spir
fore necessary to dilute them
their own bulk of pure water
them, and then to double the
cation, as suggested by Dr. U
plan is always to do this whe
stronger than 20 u. p.

"By means of the ebullioscop
content of beer, wines, and s
variety and class, may be read
with sufficient accuracy for all
poses; and by methods which
after point out, the amount of
tractive, or sugar, in cordialis
liquors and wines, may also be

"The ebullioscope (Field's Al
employed by us in numerous
investigations connected with
was made by Mr. Long, of Littl
and is an instrument which a
hands of every wine and spiri
licensed victualler, as well as
gentleman who feels interested
of the liquors in his cellar.
is accompanied by a useful
of directions and tables, which
accurately got up, as we und
late Dr. Ure, expressly for Mr.
Cooley.)

N. The affusion of water on
the purpose of removing the
that fluid. Edulcoration is
by agitating or triturating
water, and removing the
ence, by decantation or fil-
method commonly adopted
tes and other powders which
ater. The washing-bottle is
rument for the edulcoration
n its simplest form, it is a
two bent glass tubes, one
point and reaching to the
tle, the other only entering
hes. By blowing down the
water is forced out of the
tream.

NGUILLA, L. A family of
o the 'apodal' section of the
At least three species of eels
country—the 'sharp-nosed,'
,' and the 'snig.' The first,
in streams and lakes, attains
—sometimes 25 lbs. or even
ig' is considered superior to
he table. As articles of food,
e laxative and far from whole-
(EEL FAT; ADEPS ANGUILLÆ,
ong the simples of the Ph. L.
formerly considered 'good
and is even now used by the
tion for stiff joints. For the
generally dressed by stewing,
or potting, which is done in the
fish being cut into pieces 2 or
nd melted butter, onions, sweet
ovy sauce, added at will. The
a distinct and gigantic species
mily. Its flesh is coarse and
th esteemed by the inhabitants
coast of Devon, on which it

CENCE. The rapid escape of
bubbles from a liquid. See
WDER, &c.

CENCE. The spontaneous con-
ystalline solid into a dry pul-
Crystals which in a dry atmo-
ir water of crystallisation, and
d over with a mealy powder, are
LORESCENT.

OVUM, L. A body produced in
birds and certain other animals,
'embryo' of the same species, or
hich a similar animal may ulti-
duced. The eggs of the common
are nutritious and easily di-
when lightly cooked by boiling,
ith a little salt, are admirably
aliment for the sick and delicate.
hard or fried, they are rendered
, and possess no advantage in
er butcher's meat. A new-laid
p in a cup of tea, coffee, or choco-
llent ingredient *in the breakfast*
s a poor appetite, and is very supporting. A glass of wine, beer, or porter, similarly treated, along with a biscuit, has been recommended as a light and nutritious luncheon or supper, well suited to the debilitated and dyspeptic. Raw eggs may be advantageously substituted for cod-liver oil in all the cases in which this last is ordered, occurring in persons with delicate or irritable stomachs. The addition of fresh salad oil vastly increases their medicinal virtues. A fresh egg is said to contain about the same amount of nourishment as 1½ oz. of fresh meat and 1 oz. of wheaten bread, but in a more digestible form.

Egg, White of (ALBUMEN OVI), is officinal in the B. P. Yelk of egg (*vitellus ovi*) is an ingredient in the BRANDY MIXTURE (MISTURA SPIRITUS VINI GALLICI) of the London College. It is also a popular application to chaps, cracked nipples, abrasions, &c., and is largely used to render oleaginous substances miscible with water, in the preparation of emulsions.

The average weight of the new-laid egg of a hen is about 2½ oz., and its sp. gr. is 1·080 to 1·090; the white generally weighs about 1½ oz.; the yolk, a little under ¾ oz.; and the shell and skin, ¼ oz. Dr. Prout found that an egg, on being kept for 2 years in a dry situation, lost 544 $\frac{3}{10}$ grs., from the evaporation of a portion of its water through the shell. By boiling in water an egg loses from 2$\frac{0}{0}$ to 3$\frac{0}{0}$ of its weight.

Choice. The larger end of a new-laid egg feels cold when placed against the tongue. New-laid eggs appear semi-transparent when placed between the eye and a strong light, and have a small and perceptible division of the skin from the shell, which is filled with air. This mode of examination among the trade is called 'candling.' When they shake they are stale. The eggs of turkeys and pea-hens are much esteemed for some purposes; those of ducks and geese are coarse and inferior.

Pres. Eggs may be preserved for any length of time by excluding them from the air. One of the cleanest and easiest methods of doing this is to pack them with the small end downwards, in clean dry salt, in barrels or tubs, and to place them in a cool and dry situation. We have eaten eggs thus preserved that were more than a twelvemonth old, and that had been for some months on shipboard, in a tropical climate, and which yet retained all the peculiar sweetness of new-laid eggs. With a like intention, eggs are placed in vessels containing milk of lime, or strong brine, or are rubbed over with butter, lard, or gum water, all of which act by excluding the air. Eggs for keeping should never be laid on their sides, and when kept in the air should be occasionally turned to prevent the yolk attaching itself to the side, instead of floating in the albumen. Some persons place the eggs in a netting, or on a sieve or colander, and immerse them for an instant in a caldron of boiling water, before *packing them away.* The practice of packing *eggs in damp straw,* or anything else that can convey a flavour, should be carefully avoided. The shells of eggs are porous, and readily admit the passage of gaseous substances, especially of fetid odours. It is from inattention to this point that a large portion of the eggs imported from the coast of France have a less delicate flavour than those of our poultry yards. Damp chopped straw, as well as most other organic substances exposed to warmth and moisture, readily ferment or putrefy; and during fermentation a considerable increase of temperature takes place, as any one may readily perceive by examining the common hotbeds in our gardens, which are merely masses of organic matter in a state of decomposition. Eggs, as long as they retain the embryo of the future chick, in a vital state, possess in themselves a certain degree of warmth, which tends materially to promote the decomposition of the substances they are packed in, particularly in the presence of moisture.

Egg, Elas'tic. Take a good and sound egg, place it in strong vinegar, and allow it to remain for 12 hours; it will then become quite soft and elastic. In this state it can be squeezed into a tolerably wide-mouthed bottle; when in, it must be covered with water, having a little soda dissolved in it. In a few hours the egg will be restored to nearly its original solidity; after which the liquid may be poured off, and the bottle dried, the whole being kept as a curiosity to puzzle one's friends for an explanation how the egg got there. ('Parlour Pastime.')

Egg Flip. *Prep.* 1. Beer, 1 pint; eggs, 3 in no.; sugar, 2 oz.; nutmeg and ginger, q. s. to flavour; the eggs are broken into one half of the beer, the sugar added, and the whole beaten well together; the mixture is then placed in a clean warmer. and heated over the fire to nearly the boiling-point, and stirred one way all the time, care being taken not to let it either boil or curdle; the other portion of the beer and the spices are then added, and the whole mixed well together.

2. As above, but adding a glass of spirit. Some persons also add a little lemon peel.

Egg, Glaire of. *Prep.* Separate the whites from the yolks, and whisk them to a froth, let them stand 24 hours, and strain them through muslin. *Used* as a glaze or varnish by bookbinders and others.

Egg, Liquid. *Prep.* (Jayne.) From lime, 1 bushel (slaked with water); common salt, 2 or 3 lbs.; cream of tartar, ½ lb.; water, q. s. to form a mixture strong enough to float an egg. *Used* to preserve eggs, which it is stated it will do for two years, by simply keeping them in it. Once patented. Simple milk of lime answers quite as well.

Egg Wine, As egg flip, but using equal parts of white wine and water, instead of beer.

ELA'IDINE. A fatty compound of elaïdic acid and glycerin, formed by the action of nitrous acid or nitrate of mercu
It is neutral; melts at 90° Fahr.
soluble in ether, scarcely so in
one of the components of CITRI
By saponification it is resolved
constituents.

ELA'IN. See OLEIN.

ELAIOM'ETER. *Syn.* OLEO
instrument for ascertaining the s
of oils. See HYDROMETER and

ELAL'DEHYD. A peculia
substance which forms in AL
kept for some weeks at a temp
Fahr. It melts into a colour
about 38°, in which state it is
water, alcohol, and ether. It is
aldehyd, but its vapour has abou
the density of that substance, wh
combines with ammonia nor c
with potassa and solution of silv
hyd.

ELAOP'TENE. See OIL (Vola

ELAT'ERIN. *Syn.* MOMORD
active principle of ELATERIUM.
covered by Dr. Clutterbuck in 1
obtained in a state of purity in
late Mr. Hennel.

Prep. 1. (Dr. Morries.) Ela
gested in hot alcohol, the resu
filtered, evaporated to the consi
oil, and then thrown into boil
water. When the whole is cold
tate is collected and purified by
it in alcohol and precipitation
before.

2. (Hennel.) The alcoholic e
terium is digested in ether, and
dissolved in hot alcohol; crysta
solution cools.

3. An alcoholic tincture is e
the consistence of a syrup, and t
mixture of equal parts of liquor
water at a boiling temperature.
elaterin separates as the liquid co

Obs. Elaterin forms delicate,
crystals, having a bitter taste; it
about 365° Fahr.; tastes bitter
neutral; insoluble in water;
readily in hot alcohol. Its med
is similar to that of elateriu
only in its greater activity.—*Do*
$\frac{1}{20}$ gr.

ELATER'IUM. *Syn.* SQUIRTIN
In *pharmacy*, 'the fresh unripe
wild cucumber, '*Ecbalium o*
Richard,' Ph. L. (*Momordica*
Linn.). According to present us
is more generally applied to the
posited from the juice of the wil
It is thus applied in Ph. E
below.)

Elaterium. B. P. *Syn.* EXTRAC
RIUM, E. OF SQUIRTING CUCUMBE
TUM ELATERII (Ph. L.), ELATER
& D.), L. The feculence of the
above fruit.

L.) Slice wild cucumber
ripe in the long direction,
.ce, very gently expressed,
· sieve; then set it aside for
he thicker part has subsided.
natant fluid being rejected,
ortion with a gentle heat.
he other colleges are essen-

uck.) The cucumbers (fully
ngitudinally, and sprinkled
nd the juice allowed to strain
re into an earthenware vessel.
ounding pulp are next placed
. the split fruit, and washed
cold water. The washings
a the same vessel with the
s allowed to repose for a few
clear portion is decanted and
ead thinly on fine linen, and
s to the air and a gentle heat,
unshine or a bright light.
e. Forty fruits, by this pro-
5 grs. of elaterium.
ries' Hall.) The fruit, slit
laced in hempen or horsehair
itted to slight pressure in a
The juice, as it runs off, passes
hair sieve into a cylindrical
, where it is allowed to remain
when the clear supernatant
1 off, and the thick portion con-
diment is poured on a paper
1 on linen, and allowed to drain,
is dried by a gentle heat in a
oduct has a green colour, and
finest elaterium of commerce.
inferior article is obtained from
ared from the first sediment by
shallow pans, and allowing it
it.

Elaterium is sold in thin cakes,
re has a pale-gray or greenish-
loats on water, is easily pulverised
and forms with rectified spirit a
loured tincture. Elaterium ob-
second deposit (ELATERIUM NI-
k and inferior. Alcohol dissolves
60% of good elaterium. "When
r rectified spirit, the solution,
, and poured into hot dilute so-
assa, deposits, on cooling, minute
rless crystals (of ELATERIN),
om $\frac{1}{7}$th to $\frac{1}{4}$th of the elaterium
" (Ph. E.)

rocure a fine sample of elaterium,
ry to remove it as soon as it is
a heavy mucilage falls down soon
which materially injures its quality
nce. English elaterium is the best. The foreign is uniformly adulterated with chalk or starch, and coloured with sap green.

Dose. $\frac{1}{16}$ gr. to $\frac{1}{2}$ gr., formed into a pill with extract of gentian and liquorice powder; as a hydragogue and cathartic in dropsies, twice a day, repeated every other day for a week or ten days. Its use must be avoided when there is much debility or any inflammatory symptoms. Larger doses than $\frac{1}{2}$ gr. of pure elaterium are poisonous. The *antidotes* are emetics, followed by demulcents, opium, and stimulants.

EL'DER. *Syn.* SAMBUCUS (Ph. L. & E.), L. A large shrub or small tree belonging to the natural order *Caprifoliaceæ*. It is indigenous in Europe, and has long been valued for its medicinal properties. "The recent flowers of the *Sambucus nigra*" (Ph. L.) or common elder are regarded as diaphoretic and pectoral, and a distilled water (ELDER-FLOWER WATER; AQUA SAMBUCI) is made of them. The inner bark of the same tree is purgative and emetic, and is used in dropsy; the leaves are purgative; the juice of the fresh berries is made into wine (ELDER WINE), and is largely used to make FACTITIOUS PORT WINE, and to adulterate the real wine. See WATERS (Distilled).

ELECAMPANE'. *Syn.* INULA (Ph. L.), L. "The root of *Inula Helenium*" (Ph. L.). A plant of the nat. order *Compositæ*. Tonic, diaphoretic, and expectorant.—*Dose.* 20 grs. to 1 dr., or more, either in the form of powder or decoction; in catarrh, dyspepsia, &c. It is now seldom used.

ELEC'TRIC. *Syn.* ELECTRICAL. Exhibiting the effects of ELECTRICITY when 'excited' by friction; pertaining to, derived from, or produced by electricity.

Electric. *Syn.* INSULATOR, NON-CONDUCTOR. A substance which may under ordinary circumstances be readily made to evince electrical properties by friction. Electrics do not transmit, or conduct, electricity; whilst, on the other hand, ANELECTRICS are good transmitters or conductors of electrical action. The most perfect electrics are shell-lac, sulphur, amber, jet, resinous bodies, gums, gun-cotton, glass, silk, diamond, agate, and tourmaline; dry fur, hair, wood, feathers, and paper; turpentine and various oils; dry atmospheric air and other gases, steam of high elasticity, and ice at 0° Fahr. The most perfect anelectrics or conductors are the metals, charcoal, and saline fluids.

Electric Eel. The *Gymnotus electricus*, a fish having the power of giving violent electric 'shocks'; which power it exerts for killing or stunning its prey. It is an inhabitant of the fresh-water lakes and rivers of the warmer regions of America, Africa, and Asia.

Electrical Machine. An instrument for the excitation and collection of electricity. The *term is only applied* to contrivances in which *friction is the* immediate cause of the electrical *disturbance; those* which act through chemical

---

ham Gardens, elaterium is manufactured
me way, only that considerable force is
ion of the juice, and the product there-
, though *more in quantity. The manu-
commences about the second week in*
Aug.)

force, magnetism, or heat, being known by various distinctive names, as 'voltaic battery,' 'electro-magnetic machine,' 'induction-coil,' 'thermo-electric pile,' &c.

The electrical machines in common use are composed of a hollow glass cylinder, or circular plate of glass, turning on an axis, and rubbing against two or more leather rubbers covered with silk, the electricity being collected by sharp points fixed in a metal rod standing on a glass pillar. A description of these instruments, however, would be out of place in the present work, which does not aim at giving information that may be easily obtained from other sources.

Cylinder machines are seldom made of greater size than 13 inches by 9, and are about as powerful as an 18-inch plate machine. The latter are commonly made up to 3 and 4 feet diameter, and will, with a suitable condenser, give 15-inch sparks in air.

ELECTRI″CITY (-trĭs′-ĭt-e). The name given primarily to one of the great forces of nature, and secondarily to that department of *physical science* which embraces all that is known respecting this particular force. Many theories respecting the nature of electricity have been advanced for the purpose of explaining electrical phenomena. The theory of Dr. Franklin supposed the existence of a single homogeneous, imponderable fluid, of extreme tenuity and elasticity, in a state of equable distribution throughout the material world. This fluid is assumed to be repulsive of its own particles, but attractive of all other matter. When distributed in bodies, in quantities proportionate to their capacities or attraction for it, such bodies are said to be in their 'natural state.' When we increase or diminish the natural quantity of electricity in any substance, excitation is the result, and the substance, if 'overcharged,' is said to be electrified 'positively;' or if 'undercharged,' 'negatively.' These theories, and all others based upon the assumption that electricity is a form of matter, have been found to be inadequate for the elucidation of electrical phenomena.

At the present day, however, two kinds of electric forces are recognised, and distinguished as negative and positive, but they are both assumed to be analogous in principle, and very generally assumed to be simply due to different analogous motions of matter. For a full exposition, however, the reader must refer to some of the especial works on the subject.

ELECTRO-CHEM′ISTRY. That branch of *chemistry* which treats of the agency of electricity in effecting chemical changes.

ELECTRO-ETCH′ING. See Etching.

ELECTROL′YSIS (-trŏl′-e-sĭs). Electro-chemical decomposition. The voltaic current has the power of loosening and separating the constituents of certain compound bodies when these are interposed in the circuit. The substances which are thus susceptible of decomposition are termed electrolytes. They are all binary compounds, containing sing lents of their components, which are ther by very powerful affinities. Th of electrical power required to effect sition varies greatly with different ch solution of iodide of potassium, melte of lead, hydrochloric acid, water mix little sulphuric acid, and pure wate very different degrees of decompos the resistance increasing from the tioned substance to the last, which has been denied can be decomposed; the indispensable conditions of elect fluidity. When a liquid is electr components are disengaged solely at t ing surfaces, where, according to t figurative mode of speech, the curr and leaves the liquid, all the interm tions appearing quiescent. The term and 'cathode' have been proposed re for the surfaces which are supposed t and let out the current of positive e The anode is therefore directly against site the positive pole of the battery, a ing to the improved nomenclature, the electrode; and the cathode against t tive pole, or electrode. The bodies w set free by the action of the current ar ions; those which go to the anode and the positive electrode being disting the term anions, and those which g cathode and appear at the negative by the term cathions. This nomencl however, been but partially adopted making but slow way, if any, many p the old terms of electro-positive for and electro-negative for cathions.

The relative decomposing effects by the same current in different ele are exactly expressed by the chemical lents of the electrolytes. Thus, if a be made to traverse acidulated water, i potassium, and chloride of lead, the electrolytes will suffer decompositio same time, but by no means to the s tent; for the current which decompos parts of water will separate into their e 166 parts of iodide of potassium and 1 of chloride of lead. The electrolysis o lic salts is now carried out on a large the beautiful arts, which we notice u general head of Electrotype.

ELECTRO-PLA″TING and GILD′IN Electrotype.

ELECTROPH′ORUS. A simple ins for exciting electricity, generally used chemical laboratory for charging the den jars when gases have to be exp the electric spark. To construct it, a tinned iron is made into a circle of a inches diameter; a raised border is the up for about half an inch, and the edge is turned outwards over a wire t a sharp border. A mixture of equal weight of shell-lac, Venice turpenti resin, is made by gently heating them til well fused and thoroughly his composition is poured into uite fill it, and kept melted have disappeared. Another nstrument, serving the same conductor of an electric ma- of wood, rather smaller than te, rounded at the edge, and with tin-foil. An insulating of a piece of stout glass rod, is e centre of this wooden disc. s instrument it must be care- l slightly warmed. The re- is excited by beating it ob- folded piece of warm flannel. been done for about a minute, cover of the instrument is to the resinous plate, and touched . If the cover is then raised nd the knuckle approached, a k of positive electricity will the cover be again replaced, ised, a second spark will pass. repeated many times without the resinous plate. By receiving th the knobs of a Leyden jar, ng enough to give a powerful ode a gaseous mixture, may be ed. Other forms have been strument, but the essential part s a plate of some resinous sub-

TYPE. *Syn.* ELECTRO-MET'AL- AN'O-PLAS'TIC. The art of work- by the aid of electricity. Strictly term electrotype is only appli- branch of 'electro-metallurgy'— lates to the production of copies plates, medals, coins, and other it is now commonly employed in the ted by our definition. According ded signification of the term, the rotype includes ELECTRO-PLATING O-GILDING.

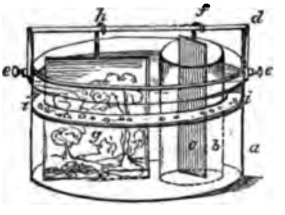
principles.—If a current from a tery be passed, by means of plati- des, through water to which some acid has been added, electrolysis hydrogen appearing at the cathode, n at the anode. If into the acid crystals of sulphate of copper be n, electrolysis will still go on, but f the elements of the water, namely, ll be evolved; for the hydrogen, on sed, will take the place of the copper tion, and the copper thus liberated leposited on the platinum plate or h constitutes the negative electrode. iment may be continued until all er is abstracted from the solution. xperiment be repeated with a copper the positive electrode, and it will be t neither of the gases will be evolved. gen, as before, will take the place of r in the solution; *the oxygen, instead y at the anode, will combine with* the copper of the electrode and the sulphuric acid to form sulphate of copper. The chemical forces called into action by the current are so beautifully balanced, that in the last experiment the quantity of copper supplied by the positive electrode exactly equals the quantity withdrawn from the solution and deposited upon the negative electrode. The whole art of electrotype consists in applying the metals thus released from their solutions to artistic or useful purposes. To obtain compact and brilliant deposits, many precautions have to be observed. The solutions must be kept saturated, or nearly so; the mould to be copied, or object to be coated, must not be too small in proportion to the size of the zinc plate of the battery; in fine, the power employed must be carefully regulated according to the work to be done. In all arrangements the moulds or objects which receive the deposits act as negative electrodes, and are consequently in connection with the zinc of the battery or generating cell.

Electrotype processes. Although reguline deposits of many metals can be obtained through the agency of voltaic electricity, we shall only treat of those of copper, silver, gold, and platinum. When copper is deposited, the object is generally to produce a substantial copy of a medal, an engraved plate, or other work of art; but when solutions containing the precious metals are electrolysed, the deposits are nearly always used for covering the surface of inferior metals. We shall notice the operations connected with the deposition of copper, and those relating to electro-plating under separate heads.

1. DEPOSITION OF COPPER:—

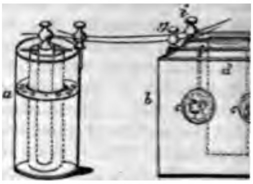
The moulds or models intended to receive the deposited metal may be formed of various materials. For medals and similar small works, moulds of fusible metal, white wax, stearine, stearic acid, and gutta percha, are commonly used. The first are formed by dropping or pressing the medals to be copied upon the melted metal, taking care that the former are quite cold, and that the surface of the metal is bright or free from oxide. To make a mould in gutta percha, the material must be softened in warm water, and then pressed upon the medal by means of a strong screw press. With the other materials the manipulation is very easy. A ribbon of cardboard or thick paper is placed round the medal, so as to form a rim; the material, which has been melted in an earthen vessel, is then poured on, and allowed to remain until quite cold and hard, when it is cautiously removed. For large works, moulds of plaster of Paris are usually employed; these require to be saturated with wax or tallow, by standing them in a shallow vessel containing these substances in a melted state. For copying seals and *small coins, impressions in ordinary sealing-wax may be* used as electrotype moulds. Non-metallic moulds must be coated with some substance which has the property of conducting electricity, before they can be used as negative electrodes. The substance commonly employed is plumbago or black-lead. It must be in the condition of an impalpable powder. It is rubbed briskly over the surface of the mould (wax, stearine, plaster, &c.) by means of a strong, fine camel-hair brush, till the whole presents the well-known black-lead polish. The adhesion of the plumbago may be often promoted by breathing slightly on the mould. To cause it to adhere to sealing-wax impressions, the wax may be slightly moistened with spirits of wine, or exposed to the vapour of ether. Delicate moulds and objects, which cannot well be black-leaded, may be covered with a conducting film of silver, by first dipping them in bisulphuret of carbon holding about $\frac{1}{20}$th part of phosphorus in solution, and then, after a few seconds, immersing them in a weak solution of nitrate of silver, and allowing them to dry in the light. Metallic moulds require no preparation.

The voltaic apparatus used may now be described. The single-cell arrangement, used for small works, is formed on the principle of Daniell's Constant Battery. It consists of a vessel of glass, earthenware, or wood, containing a smaller cell of thin biscuit ware, or other porous material; a rod or plate of amalgamated zinc, placed within the porous cell, and a wire connecting the zinc with the mould to be copied; the latter being placed in the outer vessel. The annexed figure represents a convenient form of the single-cell:—



a. An oval vessel of salt-glazed earthenware or wood nearly filled with a saturated solution of sulphate of copper.
b. A porous diaphragm, containing the cylinder or plate of zinc (*c*), and filled with dilute sulphuric acid.
d. A small bar of brass or copper, fastened to the vessel by the binding screws (*e*, *e*), and supporting the plate of zinc (*c*), by the hook of copper wire (*f*), and the mould (*g*), by the hook (*h*).
i. A small shelf or partition to support crystals of sulphate of copper, to keep up the strength of the solution.

The battery arrangement has many advantages over that described above, and should always be employed when large objects are to be electrotyped, or when a number of small moulds are to be operated upon. In this arrangement the copper solution is electrolysed in a separate vessel, termed the decomposition cell, and the current generated by one or more cells of a Daniell's or Smee's battery. This arrangement is shown in the
graving:—



a. A constant battery cell.
b. Decomposition cell; a cubical ves
earthenware, and filled with a m
dilute sulphuric acid (1 acid + 9
of saturated solution of sulph
measure.
c, *c*, *c*. Moulds suspended to the bras
nected with the zinc or positive ele
(*a*), by means of the screw (*g*).
d, *d*. Pieces of sheet copper suspende
(*h*), and connected with the zinc
by means of the screw (*i*), emplo
strength of the cupreous solution
tion cell.

To connect the moulds wi
positive element, stout copper
of thin sheet copper are em
case of a non-metallic mould,
lead directly to the plumbag
what amounts to the same t
bago must be extended to the
ment. The connecting wires,
and edges of metallic moulds,
with sealing-wax varnish, or
ducting substance, to prevent
the deposit. Before a mould
copper solution it is advisable
should be arranged, so that
may occasion immediate volt
the connection between the zin
is not effected until after the
solution may act chemically on
the mould, and cause the de
dark and dirty. When a moul
in the solution long enough to
plete coating of copper, it m
with impunity for examinat
thing is going on well, the dep
present a brilliant, light, copp
face. When sufficiently thick,
removed with care, washed, an
Etlectrotype medals may be
wash-leather and the plate bru
Various natural objects, such a
&c.; small works of art, suc
statuettes; chemical vessels, p
flasks and retorts; and num
articles, may be rendered less
ing them with copper by
process.

II. DEPOSITION OF THE
TALS.—

The solutions generally em
trolytes from which silver and
tively separated, are those

uro-cyanide of potassium.
re what chemists call double
, cyanide of potassium is
of potassium and cyanogen;
e of potassium is cyanide
ith cyanide of potassium.
this double salt is electro-
s at one electrode and cya-
er, while a proportionate
ple cyanide of potassium is
ution. But if the positive
ver, the cyanogen combines
s cyanide of silver, which
erated cyanide of potassium,
e strength of the solution.

sition of copper, the appa-
ting or gilding may be the
decomposition cell and bat-
ity of economising solutions
has, however, led to certain
the apparatus. The single-
consists, as before (see *above*),
l of glass or earthenware,
of porous biscuit ware; but
silvered or gilded is placed,
solution in the latter, while
in the outer vessel, with the
cid.[1] The zinc is usually em-
m of a cylinder, completely
porous cell. In the battery
decomposition cell may be of
s; the silver or gold employed
trength of the solution may
ires, or ingots. For plating
ingle cell of a Daniell's battery
decomposing power; gilding
ccomplished by using 3 such
ry arrangement is much more
tive, and economical than the
gement.

cale, electro-plating is carried
ats, occasionally holding from
ons of solution. Silver plates,
a powerful voltaic or magneto-
, are placed at intervals in the
n the positive electrodes, and
tent of surface with the articles
nd face them on both sides.
tea-pots, cruet-frames, forks,
t as the negative electrodes,
led by copper wires from brass
hways over the vats, and con-
e battery. The articles plated
sed of nickel silver or German
chosen on account of its silvery
ality of great importance when
coating of noble metal have
y by use.

he articles for plating, they are
solution of potassa, to free them
hey are then quickly dipped in red nitrous acid, to remove any oxide that may have formed on the surface, and after this well washed in water, to remove every trace of acid. They are then suspended from copper wires, and dipped into a solution of mercury in cyanide of potassium, or some other mercurial solution, and afterwards washed in water, as before. The amalgamation of the surface effected by the last operation promotes the adhesion of the film of silver. The articles having been weighed, are now immersed in the silvering solution, and left until a sufficient amount of silver has been deposited on them. Their condition at any time may be ascertained by weighing a test-object removed from the solution. In some electro-plating establishments the silvering solution is kept constantly stirred by simple mechanical arrangements; in others, continual motion is given to the suspended articles. On being removed from the vats the plated articles are well brushed with brushes of fine brass wire attached to a lathe, and cleaned with fine Calais sand; they are afterwards polished on revolving brushes with rottenstone, then by hand with soft leather and rouge, and, lastly, with the naked female hand. A lasting polish is given to some articles by burnishing with a burnisher formed of highly polished hardened steel, bloodstone, agate, or flint. The process of electro-gilding on the large scale is nearly the same as that of electro-plating or silvering, but, of course, plates of gold are suspended in the solution instead of silver plates.

Various solutions for silvering, plating, and platinising, have been recommended. We give below those generally employed.

1. Solvent solution. Cyanide of potassium, 2 oz.; distilled water or rain water, 1 pint; dissolve. Other proportions may be employed. *Used* as a general solvent for salts of silver, gold, and platinum.

2. Silver solution. Oxide of silver[2] (not dried), 1 oz.; the solvent solution (No. 1), 1 pint. *Used* for the single-cell apparatus; its strength being maintained as the deposition proceeds by a fresh supply of oxide from time to time.

Cyanide of silver dissolved in solvent solution (No. 1). This is the solution generally employed for plating with a separate decomposition cell.

3. Gold solution. Add to a pint of No. 1 oxide of gold, ¼ oz. *Used* in the same manner as the second silver solution.

Cyanide of gold dissolved in solution of cyanide of potassium (No. 1). *Used* as last.

4. Platinum solution. The double chloride of platinum and potassium, dissolved in solution of caustic potassa. Other solutions have been proposed, but this appears to be decomposed with the greatest ease.

The above sketch of the electrotype art is

---

f the acid water acting upon the zinc
ccording to the work to be done. If
the acid and the zinc be too energetic,
osited will be more than sufficient to
, and hydrogen will be evolved, which
he deposition.

[2] Precipitated from pure solution of nitrate of silver by excess of lime water. It should be well washed, and preserved in bottles with distilled water.

necessarily very imperfect. For minute details respecting manipulation, the reader is referred to the excellent treatises on the subject that have been written.

ELEC'TUARY. *Syn.* ELECTUARIUM, L. Electuaries (ELECTUARIA) are formed of light powders, generally vegetable, mixed up with honey, syrup, or sugar, to the consistence of a stiff paste. In the present Pharmacopœia they are included under the title Confection, but this arrangement is manifestly improper, as the words are not synonymous. In Conserves and Confections, the addition of the saccharine matter is in much larger proportion, and is designed to preserve the vegetable matter; in Electuaries, the syrup is designed merely to communicate the required form. (Dr. Murray.)

The preparation of electuaries is similar to that of confections and conserves, and the same precautions must be observed to reduce the dry ingredients to very fine powder before adding them to the syrup or other substances used to give them form. Care must also be taken to diffuse the ingredients equally through every portion of the mass, by patient and laborious stirring. The neglect of this point has often led to disagreeable consequences, from some portion of the electuary being nearly inert, while another portion has possessed increased activity. See CONFECTION, CONSERVE, LINCTUS, &c.

Electuary of Ac'etate of Potassa. See CONSERVE.

Electuary of Al'um. *Syn.* ELECTUARIUM ALUMINIS, L. *Prep.* 1. (Phœbus.) Alum, 1 dr.; extract of logwood, 4 drs.; balsam of Peru, 6 drops; water of sage, q. s. Astringent and antiseptic; in diarrhœa, sponginess of the gums, &c.

2. (St. Marie.) Alum, 1 dr.; catechu and extract of bark, of each, 2 drs.; conserve of roses, 6 drs.; simple syrup, q. s.—*Dose.* A teaspoonful, every 4 hours; in chronic diarrhœa, leucorrhœa, hæmorrhages, &c. See CONFECTION.

Electuary, An'odyne. *Syn.* ELECTUARIUM ANODYNUM, L. *Prep.* See CONFECTION OF OPIUM.

Electuary, Ar'abic. *Syn.* ELECTUARIUM SARZÆ COMPOSITUM, E. ARABICUM, L.; ELECTUAIRE ARABIQUE, Fr. *Prep.* From sarsaparilla, 5 oz.; senna and China root, of each, 3 oz.; dried walnut peel, 1 oz. (all in fine powder); honey, q. s.—*Dose.* 1 to 4 drs. See TRAITEMENT ARABIQUE.

Electuary, Aromat'ic. *Syn.* ELECTUARIUM AROMATICUM (Ph. E.). This preparation differs from the aromatic confection of the other British colleges, in not containing chalk. It is aromatic and stomachic, but not antacid or absorbent. See CONFECTION.

Electuary, Bath. *Syn.* ELECTUARIUM ANTICACHECTICUM, E. MARTIALE, E. FERRI COMPOSITUM, L. *Prep.* From blacksmiths' clinkers, reduced to an impalpable powder, and made
into an electuary with honey or tre
afterwards adding powdered ging
bonate of magnesia, of each, 1 oz.,
of the mixture.—*Dose.* A teaspo
and morning every day, for 3 or 4
again, after an equal interval,
thought necessary; as a chalybeat
in worms.

Electuary of Bitar'trate of Pot
ELECTUARIUM POTASSÆ TARTRATI
(Monro.) Cream of Tartar, 1 oz.
ginger and conserve of roses, of
syrup of orange peel, q. s.—*Dose.*
as a hydragogue purge. It is a
laxative in common cases. See
OF CREAM OF TARTAR.

Electuary, Black. *Syn.* TROUSS
TUARY, TROUSSEAU'S BLACK TO
TUARIUM NIGRUM, E. FERRI TA
Prep. From sesquichloride of i
tannin, 1 dr.; confection of roses,
of orange peel, 1 oz. Tonic and
—*Dose.* 5 to 30 grs.

Electuary of Black Pep'per. S
TION OF PEPPER.

Electuary of Burnt Sponge. *Sy*
ARIUM SPONGIÆ USTÆ, L. *Pre*
Burnt sponge, 10 grs.; rhubarb, 4 g
of roses, q. s. For a *dose*, to be
and morning; in scrofula, glandul
&c. See CONFECTION OF SPONGE.

Electuary of Cas'sia. *Syn.* EL
CASSIÆ (Ph. D. 1826.), E. C. FISTU
L. *Prep.* (Ph. D. 1826.) Fresh
and syrup of orange, of each, ½
2 oz.; tamarind pulp, 1 oz.; mix,
rate to a proper consistence.—*Do*
1 oz.; as a gentle laxative for chi
a vehicle for other cathartics.
shops is commonly made with eq
tamarind and cassia pulps, mixed
manna, and flavoured with a fe
tincture of orange peel, without
tion. See CONFECTION.

Electuary of Cat'echu. *Syn.* EL
CATECHU, CONFECTIO C., C.
Prep. (Ph. E.) Powdered catech
of each, 4 oz.; cinnamon and nutm
1 oz.; opium (dissolved in a little
dr.; syrup of red roses (evaporate
sistence of honey), 1½ pint. See C
and *below*.

Electuary of Catechu (Compo
ELECTUARIUM CATECHU COMPOSIT
See CONFECTIONS. Both the abov
gent, aromatic, and anodyne.—*D*
to 1 dr., or more; in diarrhœa, dy

Electuary, Cathar'tic. *Syn.* EL
CATHARTICUM, L. *Prep.* 1. C
senna, 1½ oz.; flowers of sulphur,
of roses or of orange peel, q. s.—*D*
spoonful, 3 or 4 times a day, in pil
3 teaspoonfuls, as a gentle laxative
and in skin diseases, gonorrhœa, &
and excellent medicine. It ma
given in larger doses.

loes, 8 grs.; cream of tartar,
. s. For a *dose*. In amenor-
to abdominal engorgement.
phal'ic. *Syn.* ELECTUARIUM
VALERIANÆ COMPOSITUM, L.
) Valerian root and mistletoe
ch, 1 oz.; honey, 1½ oz.; tinc-
, q. s. to make an electuary.
d rheumatic headache, &c.;
perient.
har'coal. *Syn.* ELECTUARIUM
CARBONII, CONFECTIO C., L.
p. F.) Confection of senna, 2
charcoal, ½ oz.; carbonate of
rup of orange peel, q. s.
Electuary of senna, 2 oz.;
oal and carbonate of soda, of
Both the above are given in
pation.—*Dose.* 1 to 3 teaspoon-
. See TOOTH ELECTUARY.
r Chol'era. *Syn.* ELECTUA-
LERICUM, L. The preparations
er this name are numerous, in-
ic confection, and several like
stringent preparations. This
given to the American remedy
iced at page 335.
Cincho'na Bark. *Syn.* ELEC-
K; ELECTUARIUM CINCHONÆ,
From yellow bark and simple
h, 1 oz.; conserve of red roses
of orange peel, of each, ½ oz,
rifuge.—*Dose.* 1 to 4 drs.; in
, &c.
) Peruvian bark, 1 oz.; syrup
l, q. s. As the last.—*Dose.* A
more, 3 or 4 times daily. (See

f Cinchona (Compound). *Syn.*
CINCHONÆ COMPOSITUM, L.
CIDULATED,—Copland.) Yellow
onfection of roses, ½ oz.; diluted
id, 1 dr.; syrup of ginger, 1½

GENT,—Saunders.) Powdered Pe-
orange peel, and conserves of roses
each, 6 drs.; crabs' eyes (or pre-
, 2 drs.; syrup of catechu, q. s.—
spoonful, 2 or 3 times daily; in
hœa, &c.
CATECHU,—Pierquin.) Peruvian
catechu and balsam of tolu, of
; syrup of comfrey (*Symphytum*
Linn.), q. s.—*Dose.* As the last;
of blood, hæmorrhages, &c.
CLOVES,—Dewees.) Peruvian
; cloves, 1 dr. (better, 4 drs.);
, q. s. A piece the size of a walnut,
or two, during the intermission of

IRON,—Cadet.) Peruvian bark,
e of iron and confection of opium,
drs.; syrup of cinnamon, q. s.—
spoonful, or more, twice a day;
the belly, *after the evacuation of*
as a tonic in debility, accompanied by nervous excitement, &c., in the absence of fever.

6. (Quarin's.) Red bark, 1 oz.; ammoniated iron, 1 dr.; made into an electuary with equal parts of oxymel of squills and syrup of the 'five roots' (diuretic). Tonic, febrifuge, and pectoral.

7. (WITH SAL-AMMONIAC,—P. Cod.) Gray bark, 2½ oz.; hydrochlorate of ammonia, 1 dr.; honey and syrup of wormwood, of each, 2 oz. In intermittents occurring in scrofulous subjects.

8. (WITH SODA,—P. Cod.) Powdered cinchona, 1 oz.; carbonate of soda, 2 drs.; thin mucilage, q. s. to mix. Tonic, febrifuge, and stomachic.—*Dose.* 2 drs., 2 or 3 times a day; in agues, complicated with acidity and dyspepsia.

9. (WITH SULPHUR,—Cadet.) Peruvian bark, 1 dr.; sulphur, crabs' eyes (chalk), and spermaceti, of each, 2 drs.; extract of opium, 4 drs.; conserve of roses, 4 drs.; syrup of milfoil, q. s. Highly praised in debility from phthisis.—*Dose.* A teaspoonful, 2 or 3 times a day, assisted with the liberal use of raw or lightly boiled eggs and cod-liver oil.

10. (WITH TIN,—Cadet.) Peruvian bark, 1 oz.; tin filings and valerian root, of each, ½ oz.; syrup of saffron, q. s. In epilepsy, worms, &c.—*Dose.* A teaspoonful, morning and evening. See CONFECTION OF BARK.

Electuary of Copai'ba. *Syn.* ELECTUARIUM COPAIBÆ, L. *Prep.* 1. Copaiba and powdered cubebs, equal parts; conserves of roses and orange peel, of each (in equal quantities), q. s.

2. (Caspar.) Blanched almonds, 6 drs.; powdered marsh-mallow root, 1 dr.; catechu, ½ dr.; balsam of copaiba, 3 drs.

3. (Ricord.) Confection of almonds, 1 oz.; copaiba, ½ oz.; hard extract of rhatany, 3 drs.; syrup of orange peel, q. s. All the above are excellent in gonorrhœa, gleets, &c. The last two agree better with the stomach than most other like preparations.—*Dose.* 1 teaspoonful, or more (rapidly increased to 2 or 3 drs.), 3 or 4 times daily. See CONFECTION.

Electuary of Cow'hage. *Syn.* ELECTUARIUM DOLICHOS, E. MUCUNÆ, L. *Prep.* 1. Dip the pods of dolichos in treacle, allow them to drain a moment, and then scrape off the hairs for use.

2. (Chamberlain.) As the last, nearly.

3. (Correa.) Cowhage (the hairs or setæ), 40 grs.; syrup, ½ oz.

4. (Ellis.) Cowhage (hairs), 1 dr.; honey, q. s.

5. (Guy's Hosp.) Cowhage (hairs), any quantity, made into an electuary with treacle, q. s. In worms.—*Dose.* For a child, a teaspoonful; for an adult, a table-spoonful; in the morning, fasting, and at night, for 3 or 4 days; followed by a dose of castor oil, to which a teaspoonful of turpentine may be advantageously added. See COWHAGE.

Electuary of Cu'bebs. *Syn.* ELECTUARIUM

CUBEBÆ, L. *Prep.* 1. See ELECTUARY OF COPAIBA.

2. (Beral.) Cubebs and copaiba, of each, 2 oz.; powdered alum, 1 oz.; extract of opium, 5 or 6 grs.; mix.

3. (Bouchardat.) Cubebs, 1½ oz.; copaiba, 1 oz.; sweet spirit of nitre, ½ fl. dr.; oil of peppermint, 8 or 10 drops; powdered sugar, q. s.

4. (Radius.) Cubebs, ½ oz.; honey, 1 oz. In gonorrhœa, mucous discharges from the vagina, bladder, &c.—*Dose.* 1 teaspoonful, afterwards increased to 2 or 3 teaspoonfuls, twice or thrice daily. See CONFECTION OF COPAIBA, ELECTUARY OF C., &c.

Electuary, Demul'cent. *Syn.* ELECTUARIUM DEMULCENS, L. *Prep.* From spermaceti, syrup of poppies, and syrup of tolu, of each, 2 drs.; powdered gum tragacanth, 1 dr.; confection of roses, 6 drs.; nitre, ½ dr.—*Dose.* A piece the size of a small filbert, frequently; as a pectoral and demulcent in coughs, hoarseness, &c.

Electuary, Deob'struent. *Syn.* ELECTUARIUM DEOBSTRUENS, L. *Prep.* (Copland.) Confection of senna, 1½ oz.; cream of tartar, 1 oz.; sulphur and syrup of ginger, of each, 6 drs.; borax, 3 drs.; syrup of poppies, 2 drs.—*Dose.* A teaspoonful, or more, nightly; in the obstinate constipation of females, painful and suppressed menstruation, &c.

Electuary for Dys'entery. *Syn.* ELECTUARIUM ANTI-DYSENTERICUM (Ph. E. 1744), L. Electuary of catechu, mixed with half its weight of Locatel's balsam.

Electuary, Emmen'agogue. *Syn.* ELECTUARIUM EMMENAGOGICUM, L. *Prep.* From myrrh, 1 dr.; ammoniated iron, 1 scrup.; syrup of ginger, q. s. to mix.—*Dose.* ½ dr. to 1 dr., night and morning; in deficient or suppressed menstruation.

Electuary for Epilep'sy. *Syn.* ELECTUARIUM ANTI-EPILEPTICUM, L. *Prep.* 1. See ELECTUARY OF CINCHONA (Comp.), No. 10.

2. (Dr. Mead.) Powdered cinchona, 1 oz.; valerian and tin (both in powder), of each, ½ oz.; syrup, q. s. to mix.—*Dose.* A teaspoonful, night and morning.

Electuary, Feb'rifuge. See ELECTUARY OF CINCHONA, &c.

Electuary of In'digo. *Syn.* ELECTUARIUM INDIGI, E. PIGMENTI INDICI, L. *Prep.* (Phœbus.) Powdered indigo, 4 drs.; aromatic powder, ½ dr.; syrup, 1 fl. oz. or q. s. In spasmodic diseases, especially in epilepsy, chorea, and hysteria, and the convulsions of children. It has also been used with advantage in that species of impotence in which strychnia is useful. The above quantity is to be all taken, in divided doses, during the day. To be of permanent advantage, it should be continued for several weeks.

Electuary of Ipecacuan'ha. See CONFECTION.

Electuary of Jal'ap. See CONFECTION.

Electuary of Kermes. MARMELADE DE ZANETTI; ELECTUARIUM KERMESI,
NERALIS, L. *Prep.* From manna,
of cassia and oil of almonds, of
butter of cacao, ½ oz.; Kermes mine
syrup of marsh-mallow, 3 fl. oz.
orange flower, q. s. A diaphoretic
Dose. 1 to 4 teaspoonfuls, or mo

Electuary of Lau'rel Ber'ries.
TION OF RUE.

Electuary, Len'itive. See CON
SENNA.

Electuary, Mahomed's. *Prep.* 1
cer's currants, 2 oz.; powdered s
powdered ginger, 1 dr.; finely po
sicum and cloves, of each, 20 grs.
3 drops; conserve of roses and syru
of each, in equal parts, q. s. to mi

2. (Bateman.) Currants, 1
½ oz.; ginger, ½ dr.; syrup of
croton oil, 1 drop.—*Dose.* 1 or 2
early in the morning; in dyspepsia
constipation. The first formulary
most useful medicine, particularl
livers.

Electuary of Male Fern. *Syn*
RIUM FELICIS MARIS, L. *Prep.*
of male fern, 3 drs.; conserve of r

2. (Radius.) Ethereal extract
½ dr.; honey of roses, 1 oz. The
to be taken at night, and the re
next morning. In worms.

Electuary of Ni'tre. *Syn.* E
POTASSÆ NITRATIS, L. *Prep.*
Nitre, 3 drs.; confection of roses,
A piece of the size of a filbert, wh
of nitre is indicated. See CONFEC

Electuary of O'pium. See CO
OPIUM.

Electuary, Pec'toral. *Syn.* E
PECTORALE, L. *Prep.* 1. (P
From conserve of roses, 2 oz.; con
der of tragacanth, 4 drs.; flowers
1 dr.; syrup of tolu, q. s.—*Dose.*
libitum.

2. Oxymel of squills, syrup of ma
mucilage of gum arabic, and syru
each, ½ oz.; powdered lump suga
the last.

Electuary of Pep'per. See CON
above.

Electuary for Piles. *Syn.* E
HÆMORRHOIDALE, L. *Prep.* 1
FECTION and ELECTUARY OF PEPP

2. (Dr. Copland.) Cream of t
precipitated sulphur (pure), 3 drs.
of senna, 2 oz.; syrup of orange pe
q. s. to mix.

3. (Dr. Graves.) Confection of
sulphur, of each, 1 oz.; balsam of
cream of tartar, of each, ½ oz.;
ginger, of each, 1 dr.; syrup of
q. s.

4. (Hosp. F.) Confection of
black pepper and precipitated sulp
½ oz.; oil of cubebs, 1 dr.; syru
last three are useful laxatives in

ıg the accumulation and hard-
ces, often remove the affection.
spoonful, three or four times a
ıe difficulty experienced in pro-
ecipitated sulphur, washed sub-
may be advantageously substi-

Pomegran'ate. *Syn.* ELECTU-
.TI, L. *Prep.* 1. From the
.; assafœtida, ½ dr.; croton oil,
serve of roses, 1 oz.—*Dose.* A
ight and morning.
Extract of the root-bark, 6 drs.;
fl. drs.; linden water, 3 fl. drs.;
ıth, q. s. to make an electuary.
e taken at once; the remainder
Both are given in tape-worm.
Rhubarb. *Syn.* ELECTUARIUM
ep. (Saunders.) Powdered rhu-
sulphate of potassa, 1 dr.; cream
rs.; pulp of tamarinds, 2 oz.—
spoonful, as a mild stomachic

of Scam'mony. See CONFECTION.
for Scur'vy. See CONSERVE (Anti-

of Sen'na. See CONFECTION OF

of Squills. *Syn.* ELECTUARIUM
Prep. 1. Oxymel of squills, 2
n of tartar and powdered sugar, of
—*Dose.* 1 to 2 teaspoonfuls, as a
expectorant; in old coughs, &c.
s.) Squills, nitre, gum ammoni-
tartrate (bitartrate) of potassa, of
; sal-ammoniac, 20 grs.; syrup of
. s.—*Dose.* 2 drs., three times a day;
See CONSERVE OF SQUILLS.
of Steel. *Syn.* ELECTUARIUM
CHALYBEATUM, L. *Prep.* 1. (Dr.
Potassio-tartrate of iron, ½ oz.;
of roses, 1 oz.; syrup, q. s. to

ier.) Precipitated sesquioxide of
; honey, 2 oz.; ginger syrup, ½ fl. oz.
bove are tonic and emmenagogue.
ne teaspoonful, thrice a day. See
s.
y, Stim'ulant. *Syn.* ELECTUARIUM
, L. *Prep.* From gum ammoni-
ined), 1 oz.; vinegar of squills, ½ oz.;
h a gentle heat, and spread on leather.
the chest or pit of the stomach, as
ounter-irritant and antispasmodic;
iscutient to tumid glands and indo-
rs. It is wrongly called an elec-

y, Stomach'ic. *Syn.* DINNER ELEC-
ELECTUARIUM STOMACHICUM, CON-
OMACHICA, L. *Prep.* 1. Rhubarb,
d extract of chamomile, of each, 1
ction of orange peel, 4 drs.; syrup,

barb and gentian, of each, 1½ dr.;
f hops and *powdered capsicum, of*
*y oil of chamomile, 12 drops; con-*fection of hips and syrup of orange peel, of each, ½ oz.

3. Green peppermint, lump sugar, and confection of orange peel, equal parts.—*Dose.* A teaspoonful, an hour before a meal. They are all excellent stomachics, and are useful to improve the appetite, and in dyspepsia.

Electuary of Sul'phur. See CONFECTION OF SULPHUR, and *below.*

Electuary of Sulphur (Compound). *Syn.* ELECTUARIUM SULPHURIS COMPOSITUM, L. *Prep.* 1. Sulphur, ½ oz.; cream of tartar, 1 oz.; confections of senna and black pepper, of each, 2 oz.; syrup of ginger, 1 fl. oz. An excellent medicine in piles.—*Dose.* A teaspoonful, twice a day.

2. (WITH BORAX.) Flowers of sulphur, 1 oz.; cream of tartar, 1½ oz.; borax, ½ oz.; confection of senna, 2½ oz.; syrup of orange peel, q. s. to mix.—*Dose.* 1 to 3 teaspoonfuls, in diseases of the uterine organs and lower bowels. See CONFECTION.

Electuary for the Teeth. *Syn.* ELECTUARIUM DENTIFRICUM, L. See TOOTH PASTE, DENTIFRICE, &c.

Electuary of Tin. See CONFECTION OF TIN, and *below.*

Electuary of Tin (Compound). *Syn.* ELECTUARIUM STANNI COMPOSITUM, L. *Prep.* 1. Powdered tin, 1 oz.; confection of oil of turpentine, 2 oz.

2. (Dr. Cheston.) Tin filings, 4 drs.; carbonate of iron (sesquioxide), 1 dr.; conserve of wormwood, 3 drs.

3. (Foy.) Powder of tin, 1 oz.; extract of wormwood and powdered jalap, of each, 1 dr.; compound syrup of chicory, q. s. In worms. —*Dose.* A table-spoonful, or more, for 2 or 3 successive mornings, fasting; followed by a purge.

Electuary of Tur'pentine. *Syn.* ELECTUARIUM TEREBINTHINÆ, L. *Prep.* 1. (St. B. Hosp.) Common turpentine, 1 oz.; honey, 2 oz.—*Dose.* 1 to 2 teaspoonfuls; in complaints of the urinary organs, worms, &c.

2. (Radius.) Turpentine, soap, and rhubarb, of each, 1 dr.; syrup of wormwood, q. s.—*Dose.* Three teaspoonfuls a day; in dropsy, worms, &c.

3. (E. OLEI TEREBINTHINÆ, — Copland.) As Confection of Turpentine,—Ph. D. See CONFECTION.

Electuary, Ver'mifuge. *Syn.* ELECTUARIUM ANTHELMINTICUM, E. VERMIFUGUM, L. *Prep.* 1. (Bresmer.) Worm-seed and tansy-seed, of each, 4 drs.; powdered valerian root, 2 drs.; jalap and sulphate of potassa, of each, 1½ to 2 drs.; oxymel of squills, q. s. to mix.—*Dose.* A teaspoonful, or more; repeated night and morning, followed by a brisk purge.

2. (Rosenstein.) Worm-seed, 10 grs.; sulphate of iron, 4 grs.; jalap and honey, of each, 20 grs. For two doses, as the last. 2 or 3 drs. of *confection of senna* are often substituted for *the jalap and honey.*

3. (Foy.) Aloes, ½ oz.; common salt, 3 drs.;

flour, 2 oz.; honey, q. s. to form a stiff paste. *Used* as a suppository in ascarides.

4. Flowers of sulphur, 4 oz.; powdered jalap, 1 oz.; powdered bark, 1 oz.; syrup of buckthorn, q. s.—*Dose.* Two or three teaspoonfuls, every morning early. See CONFECTION and ELECTUARY OF TIN, TURPENTINE, WORM-SEED, &c.

Electuary for Worms. See VERMIFUGE ELECTUARY (*above*).

EL'EMENTS. *Syn.* ELEMENTARY BODIES, SIMPLE B.; ELEMENTA, L. In *chemistry*, those substances or bodies which have hitherto resisted every attempt which has been made to decompose them, or to resolve them into simpler forms of matter. Earth, air, fire, and water, were regarded by the ancients as simple bodies, of which all others are composed, and they still constitute the 'four elements' of the vulgar. The imaginary principles or elements of the alchemists were termed salt, sulphur, and mercury. About sixty-four different kinds of matter are at present recognised as elementary bodies. They are substances having the most diverse characters. The great majority exist in the solid state; bromine and mercury are liquid; while oxygen, hydrogen, nitrogen, and chlorine, are gaseous. About four fifths of the elements are metallic, as instanced by gold, silver, copper, iron, &c.; the remainder are non-metallic, as instanced by carbon, sulphur, phosphorus, &c. A list of the known elements is given under the head of ATOMIC WEIGHTS (which *see*).

EL'EMI. *Syn.* GUM ELEMI; ELEMI (B. P.). "A terebinthinate concretion, from an uncertain plant." (Ph. L.) MEXICAN ELEMI is known to be the produce of a species of the genus *Elaphrium.* MANILLA ELEMI is probably the product of *Canarium commune.*

Prop., &c. The elemi of commerce is of a pale-yellow colour, brittle without, but soft and tough within; it has a warm bitter taste, and a fragrant aromatic smell, partaking of fennel and juniper. It is only partially transparent even in thin plates, is very fusible, and has a density a little greater than that of water. It contains 12¼ per cent. of volatile oil (oil of elemi). It is used to give toughness to lacquers and varnishes, and in medicine in the preparation of ELEMI OINTMENT.

Pur. The elemi of the shops is often adulterated, but more frequently a factitious kind is sold for the genuine gum. This fraud may be detected by exposing the suspected article to heat, along with a little water, when the factitious fragrance of the spurious article evaporates, and the coarse terebinthinate smell of the resin used to adulterate it, or which is sold for it, becomes readily distinguishable.

Elemi, Facti''tious. *Prep.* 1. Yellow resin, 8 lbs.; melt, add Canada balsam, 2 lbs.; withdraw the vessel from the heat, and further add, of oil of juniper, 2 drs.; oil of sweet fennel, 1 dr.; oil of nutmeg, ½ dr.

2. Yellow resin, 7 lbs.; Canada balsam, 1 lb.; juniper oil bottoms, 4 drs.; oil of n
mix as before.

EL'EMIN. The crystalline re
elemi.

ELIX'IR. In *pharmacy*, a na
applied to various compound tinct
preparations supposed to contain
sence of other substances. (It is
to several popular remedies.) T
the alchemists were solutions
their fruitless attempts to transm
metals into gold.

Elixir, Ac'id. *Syn.* ELIXIR
Prep. 1. (Dippell's.) Sulphuric
dropped gradually into rectified sp
5 parts; placed in a large flask, an
coloured by digestion on animal
saffron, of each, 1 part.

2. (Haller's,—Ph. Sax. 1837.)
phuric acid and rectified spirit, of
as before.

3. (Vogler's.) From sulphuri
nitrous ether, equal parts, as abo
gent and antiseptic.—*Dose.* A fe
water.

Elixir of Al'oes. *Syn.* COMPOUN
OF ALOES; ELIXIR ALOËS, L. See

Elixir of Aloes (Compound).
ALOËS COMPOSITUM, L. *Prep.* (D
Acetate of potassa, inspissated ox-g
aloes, and myrrh, of each, 2 drs.;
1 dr.; brandy (or proof spirit),
digest a week, and strain. Sto
laxative.—*Dose.* A teaspoonful,
dyspepsia, constipation, &c.

Elixir, Anti-asthmat'ic. *Syn.* E
ASTHMATICUM, L. *Prep.* 1. Oil
camphor, and balsam of tolu, of
cochineal, 1 dr.; proof spirit, 1 ga
week, and filter.

2. As the last, adding powdered o
—*Dose.* A teaspoonful, to allay i
sisted by an occasional dose of ap
cine; in asthma, chronic coughs,

3. (Boerhaave's.) Aniseed, asar
campane, liquorice root, orris root
flag (calamus), of each, equal p
into a tincture, with brandy.—
40 drops.

Elixir, Anti-scrof'ulous. *Syn.* E
SCROFULOSUM, L. *Prep.* 1. (P.
ammoniated tincture of gentian.
TURE.

2. (Desforges.) Guaiacum, 5 oz
bark and pellitory, of each, 3
5 drs.; orange peel and benzoin, of
hay saffron, ½ dr.; rectified spirit
of each, ½ pint; digest a week,
Used as an application to scorbutic

Elixir, Boerhaave's Asthmat'ic.
ASTHMATIC ELIXIR (*above*).

Elixir, Boerhaave's Vis'ceral.
BOERHAAVII, E. B. VISCERALE. L
Han.) Aloes, myrrh, and saffron,
oz.; tartrate of potassa, 2 oz.; alcoho
rectified spirit), 14 oz.; water, 1

er. This preparation "has
ised in visceral obstruction."
Dose. 1 to 3 teaspoonfuls.
r's. *Syn.* Elixir Clauderi,
Salt of tartar, sal-ammoniac,
and myrrh, of each, 1 oz.;
ter, 1½ pint, digest, with agi-
urs, and filter.
Carbonate of potassa, 1 oz.;
, myrrh, saffron, and rhubarb
each, 2 drs.; water, 18 fl. oz.
days, and decant.—*Dose.* 1 to
; in amenorrhœa, constipation,
obstructions, &c.
Syn. Elixir anti-catar-
ep. 1. See Anti-asthmatic

.) Extracts of blessed thistle
, of each, 1 dr.; cherry-laurel
; fennel water, 1 fl. oz.—*Dose.*
fuls, 3 or 4 times a day. It is
remedy in coughs occurring in
ical, or irritable patients. See
cacuanha, Lettsom's Elixir,

r's. *Syn.* Elixir salutis, E.
situm, Tinctura sennæ com-
his is an aromatised and sweet-
f senna, to which other cathar-
lly added. Nearly every drug-
own formula for this article.
are those employed in the Lon-

ast India senna, 1½ lb.; jalap,
r seed and aniseed, of each, ½ lb.;
; red sanders wood, 2 oz.; salt
; treacle, 7 lbs.; rectified spirit
alls.; water, 3¼ galls. All the
l bruised, and macerated in the
for 14 days, when the whole is
strained through a flannel bag.
tinous to run through filtering

rhubarb, and aniseed, of each,
and caraways, of each, 1 lb.; red
½ lb.; brown sugar, 7 lbs.; proof
s.; as the last.
56 lbs.; aniseed, 7 lbs.; rhubarb
14 lbs.; coriander seed, 6 lbs.;
and red sanders wood, of each,
a bark and jalap, of each, 3 lbs.;
100 galls.; digest for 14 days,
, and add molasses, 84 lbs.; mix
ither clarify or strain through

of spirit in the last two formulæ,
of spirit of wine and water are
the smaller houses.
od.) Senna, ½ lb.; aniseed, cara-
lap, of each, 1 oz. 2 drs.; juniper
oz.; proof spirit, 6 pints; mace-
days, then add of treacle, 10½ oz.;
oz.; mix and strain.
4.) Senna, 1 lb.; guaiacum shavings,
oot (dried), *aniseed, caraway seed,*
and liquorice root, of each, ½ lb.; stoned raisins, 2 lbs.; proof spirit or brandy, 9 quarts; macerate for 10 days.

7. (Swinton's.) Senna, 1 lb.; jalap, 3 lbs.; coriander seed, caraway seed, liquorice root, and elecampane root, of each, 4 oz.; moist sugar, 2 lbs.; rectified spirit of wine and water, of each, 1 gal.; as the last.

Obs. Daffy's elixir is a favorite purge with drunkards, and is a common and very popular remedy in flatulent colic, dyspepsia, diarrhœa, &c.—*Dose.* 1 to 4 table-spoonfuls, or more.

Elixir, Devil's. *Syn.* Elixir capsici compositum, L. *Prep.* From pods of capsicum, and cloves (bruised), of each, 1 oz.; ginger and saffron, of each, 3 oz.; cantharides, 5 drs.; proof spirit, 7 lbs.; digest for 10 days.—*Dose.* ½ dr. to 3 drs., in mixtures. It is stimulating, anti-choleraic, and aphrodisiac.

Elixir of Garlic. *Syn.* Elixir Allii, L. *Prep.* From garlic roots (bruised), 80 in no.; rectified spirit, 1 pint; digest, distil to dryness, and repeat the process with the same spirit from fresh roots, a second and a third time; lastly, add camphor, 2 dr. Diaphoretic and pectoral.—*Dose.* A teaspoonful, twice a day; in asthma, old coughs, diarrhœa from debility, &c.

Elixir, Garus's. *Syn.* Elixir Gari, L.; Elixir de Garus, Fr. *Prep.* 1. Myrrh, 1 oz.; aloes and saffron, of each, ½ oz.; cinnamon, cloves, and nutmeg, of each, 1 dr.; proof spirit, 1 quart; digest a week, add water, 5 fl. oz., and distil over 1 quart; to the distillate (alcoolat de Garus) add of syrup of maidenhair, 2 lbs.; orange-flower water, 1½ fl. oz.

2. (Foy.) Compound tincture of saffron, 8 pints; syrup of maidenhair, 10 pints; mix; add caramel, q. s. to colour, dissolved in orange-flower water, ½ pint.

3. (P. Cod.) Aloes and saffron, of each, 1 oz.; myrrh, cinnamon, and cloves, of each, ½ oz.; nutmeg, ½ dr.; proof spirit, 12 pints; orange-flower water, 16 fl. oz.; macerate 2 days, distil 6 pints, and add to the distillate (alcoolat de Garus), of syrup of capillaire, 7½ pints; and colour with saffron, q. s.

4. (Soubeiran.) Socotrine aloes and saffron, of each, 1 oz.; myrrh, canella alba, citron, and nutmegs, of each, ½ oz.; spirit (sp. gr. ·923), 20 lbs.; orange-flower water, 16 fl. oz.; macerate as last, distil 10 lbs., and add to the distillate (alcoolat de Garus), of syrup of capillaire, 12½ lbs.; orange-flower water, 8 fl. oz.; with saffron q. s. to colour.

5. (Thierry.) Aloes, myrrh, and saffron, of each, 2 drs.; nutmeg, 4 drs.; canella alba and cloves, of each, 1 oz.; spirit (·864), 13 lbs.; draw over 12 lbs. of 'alcoolat;' add to the residue of the distillation, rose water, 10 lbs.; distil 6 lbs., and add as much of this aromatic water to the alcoolat as will raise its sp. gr. to ·890. Then to every 11 lbs. of the above mixed liquor, add of simple syrup, 15 lbs.; tincture of vanilla and orange peel, of each, 2½ fl. oz.; fresh milk (skimmed), 1 lb.; and tincture

of saffron, q. s. to colour; digest with agitation for two days, and filter. *Used* as a stomachic, carminative, and stimulant, in doses of a wineglassful. That prepared without distillation forms an excellent stomachic purge. With the exception of that from the 2nd formula, the products may be regarded as agreeable cordial liquors, rather than medicines. It is much employed on the Continent.

Elixir of Gold. *Syn.* ELIXIR AURII, L.; ELIXIR D'OR, Fr. *Prep.* 1. De la Motte's Golden Drops.

2. Terchloride of gold, 20 grs.; rectified spirit, 6 fl. drs.; ether, 3 fl. drs.; dissolve.—*Dose.* 5 to 15 drops, taken in distilled water; in gout, scrofula, nervous diseases, cancer, indurated glands, secondary syphilis, &c. This last preparation is often confounded with the *gouttes d'or du Général de la Motte;* but the two are evidently distinct articles. See DROPS.

Elixir, Haller's. See ACID ELIXIR (*above*).

Elixir, Hoffman's Visceral. *Syn.* ELIXIR HOFFMANNI, E. H. VISCERALE, L. *Prep.* 1. As ELIXIR OF ORANGE-PEEL,—Ph. Bor. 1847.

2. Thin outside peel of orange (dried), myrrh, and centaury, of each, 2 drs.; extracts of carduus benedictus, cascarilla, and gentian, of each, 1 dr.; white wine (sherry), 1 quart. Aromatic and stomachic.—*Dose.* A dessertspoonful, or more.

Elixir of Ipecac'uanha. *Syn.* ELIXIR IPECACUANHÆ, L. *Prep.* (Cadet.) Powdered ipecacuanha and balsam of tolu, of each, 4 drs.; flowers of benzoin, opium, and saffron, of each, 2 drs.; oil of aniseed, 1 dr.; camphor, 40 grs.; alcohol (rectified spirit), 1½ pint; digest a week, and filter.—*Dose.* 1 to 2 drs., as a stimulant, diaphoretic, expectorant, and stomachic; in chronic coughs, asthmas, and old colds, and in certain forms of deficient appetite, dyspepsia, diarrhœa, &c.

Elixir of Jal'ap. *Syn.* ELIXIR JALAPÆ COMPOSITUM, L. *Prep.* From jalap, 4 oz.; scammony, 4 drs.; gamboge, 2 drs.; proof spirit, 1 quart.—*Dose.* ½ dr. to 3 drs., as a purgative; especially in worms.

Elixir, Lettsom's. *Prep.* (Augustin.) Oil of aniseed, 1 dr.; camphor, 1½ dr.; benzoic acid, opium, and saffron, of each, 2 drs.; ipecacuanha and balsam of tolu, of each, 4 drs.; rectified spirit, 2 lbs.; digest 10 days, and filter.—*Dose.* 5 to 15 drops, for a child; ½ to 1 teaspoonful, for an adult; in ordinary coughs, hooping-cough, &c.

Elixir, Live-long. *Syn.* ELIXIR OF LONG LIFE; E. LONGÆ VITÆ, L. *Prep.* 1. See TINCTURE OF RHUBARB AND ALOES.

2. (ELIXIR VITÆ MATTHIOLI.) A mixture of several aromatics and stimulants, made with rectified spirit.

Elixir of Myrrh. *Syn.* ELIXIR MYRRHÆ, L. See TINCTURE OF SAVINE (Comp.),—Ph. L. 1788.

Elixir d'Or. See ELIXIR OF GOLD.

Elixir of Or'ange Peel. *Syn.* ELIXIR AURANTIORUM COMPOSITUM, L. *Prep.* 1. (Ph. Bor. 1847.) Orange peel, 6 oz.;
2 oz.; carbonate of potassa, 1 oz.
wine, 4 lbs.; macerate 6 days,
tincture, and add of extracts of b
carilla, gentian, and wormwood, of
dissolve, and after repose for
decant and filter. An excell
bitter and stomachic.

2. (Moscati.) Orange peel, 1
rilla, ½ oz.; waters of citron peel
wood, and rectified spirit, of eac
digest a week. Resembles the last.
either). A table-spoonful to a win

Elixir, Paregor'ic. *Syn.* ELIXIR
CUM, L. See TINCTURE OF
(Comp.).

Elixir, Paregoric (Scotch). *Sy*
PAREGORICUM SCOTICUM, L. See
OF OPIUM (Ammoniated).

Elixir, Pec'toral. *Syn.* ELIXIR
L. (Ph. E. 1745) Balsam of to
gum benzoin, 1½ oz.; saffron, ½ oz.
spirit, 32 fl. oz.; digest in a gentle
days, and filter.—*Dose.* ½ to 1 t
(See *above.*)

Elixir, Pol'ychrest. *Syn.* ELIXIR
TON, L. *Prep.* (Ph. E. 1745.)
(gum), 6 oz.; balsam of Peru, ½ oz.
spirit, 23 fl. oz.; digest as last, stra
oil of sassafras, 2 fl. drs. Pectoral
rheumatic.—*Dose.* 10 to 60 drops,

Elixir, Paracelsus's. See ELIXIR
TATIS (*below*).

Elixir Proprieta'tis. [L.] *Syn.*
SUS'S ELIXIR OF PROPRIETY; E
PROPRIÉTÉ DE PARACELSE, Fr. A
paration, nearly corresponding to
pound tincture of aloes of modern
and which is now sold for it. *Prep.*
beiran.) Tincture of myrrh, 4 oz.;
of aloes and saffron, of each, 3 oz.
Pharm.' 1847.)

2. (ELIXIR PROPRIETATIS CUM A
The last, slightly acidulated with oi
and filtered.

b.—Ph. Bor. 1847.—Aloes and
each, 2 oz.; saffron, 1 oz.; spirit (s
2 lbs.; dilute sulphuric acid (1 to
macerate 4 days, and filter.

3. (ELIXIR PROPRIETATIS TARTA
E. P. ALKALIZATUM.) From elixir
tis, alkalised with salt of tartar, a
The last two are old preparations,
inquired for in this country, excep
remote from London.

Elixir, Radcliffe's. *Prep.* 1.
trine aloes, 6 drs.; rhubarb, 1 dr.;
(cassia), cochineal, and zedoary ro
½ dr.; syrup of buckthorn, 2 fl. o
1¼ pint; digest 10 days, and strain.

2. As the last, but substituting p
1 pint, and water, ¼ pint, for t
Aromatic, stomachic, and aperient.-
to 4 drs.; in similar cases to thos
'DAFFY'S ELIXIR' is taken.

Elixir of Ro'ses. *Syn.* ELIXI

de rose, 2 fl. oz.; spirits of
scurvy grass, of each, 1 fl. oz.;
drops; camphor and cochineal
er), 12 grs.; powdered sugar-
igest, with frequent agitation,
i after repose decant the clear,
ugh a piece of muslin. *Used*
application in scurvy of the
to perfume the breath.

Cinnamon, 3 oz.; ginger, 2 oz.;
essence of peppermint, 1 oz.;
peel, 1 dr.; otto of roses, 15
ectified spirit, 2½ pints; digest
ter. *Used* as a tooth cosmetic.

m. Tincture of aloes and rhu-

is. *Syn.* ELIXIR OF HEALTH.
l tincture of senna of old phar-
ffy's ELIXIR.

am'mony. *Syn.* ELIXIR SCAM-
Prep. (Guibourt.) Scammony
: proof spirit, 8 fl. oz.; mix in a
l, apply heat, set the spirit on
f sugar, 4 oz.; when the whole
(melted down), extinguish the
ther add of syrup of violets, 2
vell, and after sufficient repose
ar portion from the dregs. The
ld be 12 oz., containing 12 grs.
per oz.—*Dose.* 1 to 2 dessert-
milk or aromatised water; or
n emulsion with aromatics; in

ire's. *Prep.* 1. (Original For-
um musivum, 3 oz.; opium, 2 oz.;
z.; cochineal, ½ oz.; sweet fennel,
ture of serpentary, 1 pint (old
it of aniseed, 1 gal. (old meas.);
.; dissolved in water, 1 pint (old
est 10 days, and filter.

ed opium, 2 oz.; ginger, red san-
and camphor, of each, 1 oz.; oil of
s.; oil of sweet fennel, ½ dr.; tinc-
rpentary, 1 pint; proof spirit, 5
er, 1 quart; as last. Stimulant,
aphoretic, and pectoral.—*Dose.* 1
nfuls; in chest affections, nervous
&c., in the absence of inflammatory
.

tomach'ic. Compound tincture of
s formerly so called.

oughton's. *Prep.* 1. Raisins
d bruised), 1 lb.; gentian root, ¾
orange peel, 6 oz.; serpentary, ¼ lb.;
omaticus, 1½ oz.; cardamoms, ½ oz.;
uring, ½ pint; brandy or proof spirit,
igest a week, and strain.

ure of gentian (compound), and
proof spirit, of each, 1 quart; tinc-
rpentary and syrup of saffron, of
t; tinctures of aloes and rhubarb,
pint; bitter almonds (bruised), 8 in
as before.

) Aloes and cascarilla, of each, 1
h, 4 drs.; gentian, germander, dried
and wormwood, of each, 6 drs.; rectified spirit, 32 fl. oz.; as before. Stimulant, tonic, and stomachic.—*Dose.* 20 drops to a teaspoonful.

Elixir, Ton'ic. *Syn.* ELIXIR ROBORANS. See TINCTURE OF CROWN BARK (Comp.,—Ph. Bor. 1847).

Elixir, Tooth. *Syn.* ELIXIR DENTIFRICUM, L. *Prep.* 1. (Lefaudinière's.) Guaiacum raspings and cloves, of each, 1 oz.; pellitory of Spain and nutmeg, of each, 2 drs.; oil of rosemary, 20 drops; bergamotte, 10 or 12 drops; brandy, 1 quart; macerate a fortnight, and filter.

2. Cinnamon, cloves, and nutmeg, of each, 1 dr.; vanilla, ½ dr.; camphor, 10 grs.; tincture of pellitory, 2 fl. oz.; brandy or proof spirit, ½ pint; digest as before. See ANTI-SCORBUTIC and ROSE ELIXIRS (*above*).

Elixir, Vis'ceral. *Syn.* ELIXIR VISCERALE, L. See BOERHAAVE'S and HOFFMAN'S ELIXIRS (*above*).

Elixir of Vit'riol. 1. The old name for aromatic SULPHURIC ACID (which *see*).

2. (Mynsicht's.) See TINCTURE (Acid Aromatic).

3. (Scourer's.) Dilute sulphuric acid (1 to 5). *Used* to scour metals.

4. (SWEET E. OF V.; E. VITRIOLI DULCI, L.) The old name for aromatic SPIRIT OF ETHER (which *see*).

5. (Virgani's.) *Prep.* From spirit of sulphuric ether, 2 lbs.; aromatic tincture, 3 lbs.

Elixir, Woroneje. Capsicum, 1 oz.; nitre, ½ oz.; sal-ammoniac, 2 drs.; nitro-hydrochloric acid, 2 fl. drs.; vinegar, 1½ pint; native white or rose naphtha, or petroleum, 1½ fl. dr.; olive oil, 1 fl. oz.; oil of peppermint (Mitcham), 15 fl. oz.; strongest rectified spirit, 6 quarts; digest 12 days, with constant agitation, and filter.—*Dose.* 2 teaspoonfuls, every 15 minutes; in cholera, diarrhœa, &c.

ELLAG'IC ACID. $HC_7H_2O_4 . Aq$. When an aqueous infusion of nut-galls is left for some time exposed to the atmosphere, the tannic acid gradually disappears, and is replaced by gallic acid, and an insoluble gray powder, to which the term ellagic acid was applied by Chevreul. It is soluble in alkalies, forming salts, and is precipitated by acids.

ELM. *Syn.* ULMUS, L. A genus of trees forming the type of the natural order *Ulmaceæ*. The interior bark of the *Ulmus campestris*, or *common small-leaved elm* (*Ulmi cortex*), is officinal in B. P. This substance is demulcent, diaphoretic, and diuretic, and slightly febrifuge, astringent, and tonic. It has been employed in agues, and as a substitute for sarsaparilla in cutaneous eruptions, but is now little used. The *leaves* of the elm tree are reported to be vulnerary. See DECOCTION and ULMINE.

ELUTRIA'TION. Cleansing by washing. The term is commonly applied to the operation of washing insoluble powders with water, to separate them from foreign matter, or the coarser portion. It is usually performed by grinding or triturating the mass with a little water, until reduced to a very fine powder, and this paste is suddenly diffused through a large quantity of water, contained in a deep vessel, from which, after the subsidence of the grosser portion, the liquid is poured into another vessel, and allowed to deposit the fine powder it still holds in suspension. When this has taken place, the clear supernatant liquor is decanted, and the sediment drained and dried. The coarse sediment deposited in the first vessel is now submitted to a fresh grinding and diffusion through water, and the entire operation is repeated, until the whole of the pulverisable portion is washed over. The proper length of time for the liquid to remain in the first vessel depends solely on the density of the powder and the degree of fineness required in the product; heavy powders subsiding almost immediately, while light ones often take several minutes to deposit the coarser portion. Sometimes three or more vessels are employed, and the muddy liquor, after remaining a short time in the first, is poured into the next one, and this, in a short time longer, into the third, and so on, until the last vessel is filled, by which means powders of different degrees of fineness are obtained, that deposited in the last vessel being in the minutest state of division. The elutriated paste or moist powder is then drained, and dried. On the small scale, the trituration is performed with a stone and muller, or in a mortar; on the large scale, in a mill, driven by either horse or steam power. Antimony, chalk, bistre, and other pigments, as well as various other substances insoluble in or unacted on by water, are commonly obtained in the state of an impalpable powder by elutriation, or 'washing over,' as it is called by amateurs and operatives.

ELYDOR'IC PAINTING. A method of painting invented by M. Vincent, of Montpetit, in which the pigments are mixed up with an emulsion of oil and water. It is said to add the fresh appearance of water colours, and the finish of miniature painting, to the mellowness of oil colours.

EMBALM'ING. *Syn.* MUMMIFICATION. The preservation of the dead bodies of animals. See MUMMY and PUTREFACTION.

EMBOS'SING. The formation of ornamental figures in relief on *cloth, leather, paper,* and *wood,* has now been brought to such perfection, as to place this species of decoration within the reach of almost every class of society. EMBOSSED CLOTH and PAPER are now employed by the bookbinder to cover even the low-priced volumes that pass through his hands; whilst the EMBOSSED LEATHER that encloses the album or ornaments our furniture, frequently bears the richest patterns of the arabesque or moresque. *Cloth* and *paper* are usually embossed by machinery; *leather* and *wood,* more frequently by hand labour.

EMBROCA'TION. *Syn.* EMBROCATIO, L.
A fluid medicine for external and
Embrocations do not differ, mate
liniments and lotions, and are ap
same manner. (See those prepa
below.)

Embrocation, Guestonian. *Sy*
CATIO TEREBINTHINÆ CUM ACIDO,
(Dr. Paris.) Oil of turpentine a
of each, 1½ oz.; dilute sulphuri
drs.; agitate together until mixe
rheumatism, &c.

Embrocation, Lynch's. Olive
with alkanet root), 5 fl. oz.; oil
rosemary, and turpentine, of eac
bruises, rheumatism, &c.

Embrocation, Roche's. *Prep.* 1.
Olive oil, mixed with half its w
oils of cloves and amber.

2. Olive oil, 2 oz.; oil of amber,
of cloves and lemons, of each, 1 dr.
ing-cough.

Embrocation, Ward's. See Ess

EMBROID'ERY. Gold and
work of this description may be
a little spirit of wine, either alon
with an equal weight of water.
quently used for the same purpose.
mon practice of using alkaline or
is very injurious, and frequent
the beauty of the articles instead
them.

EM'ERALD. *Syn.* SMARAGDUS;
Fr. This beautiful deep-green
next to the diamond in value. Th
brought from Peru, but fair
found in Bavaria, Siberia, and In
emerald weighing 4 or 5 grs. is wo
pounds; one of 10 grs., about £2 p
of 15 grs., £3 to £4 per gr.; and s
portion to the increase in size. On
if of pure water, is worth about
cording to the analysis of Va
purest specimens consist of 65 par
alumina, 13 glucina, 2·56 lime, and
of chromium, to which last the g
rich green colour. See BERYL, G
&c.

Emerald Green. See GREEN PIG

EMERY is an impure, amorpho
and opaque variety of corundum,
of alumina, with a small per-centa
and peroxide of iron. It occurs in
isles of Greece, and other localities,
its name from Cape Emeri, in th
Naxos. Its hardness is so gre
scratches and wears down nearly
except the diamond; hence the
powder for cutting and polishing
various other hard substances. F
cial purposes, the lumps of emer
from the mine, are broken into
the size of a hen's egg, which are
under stampers, similar to tho
pounding metallic ores. The coa
then sifted through sieves covere
cloth of different degrees of fine

different sizes. In this state
ry of the shops, or flour emery.
oses, it is afterwards prepared

are formed by melting emery
e bees' wax, and after thorough
ing it into solid lumps of suit-
to dress the edges of buff and

is prepared by brushing the
cotton cloth over with liquid
g the emery powder over the
ill warm.
is made in the same way as
Both are used either with or
he same way as glass paper.
are made of pieces of wood in
nd are used for the same pur-
paper.
are formed of emery, of the
ness, mixed with about half
od Stourbridge loam, and water
stiff paste, which is forced into
s by a powerful press. The
oroughly dry, are exposed in a
ort time to a temperature just
hite heat. In this way 'discs'
generally made. For 'wheels,'
am is used. Another method,
cutting-stones' generally, is to
r emery, previously moistened
to moulds, with strong pressure,
hout any other addition, and
at nearly a full white heat.

Syn. **EMETIN, EMETINA.** A
alkaloidal body, existing in and
ctive principle of ipecacuanha.
Medicinal—EMETIC EXTRACT.)—
a (in coarse powder) is digested
and then in rectified spirit for 3
e alcoholic tincture is next ex-
evaporated (distilled) to dryness;
a is dissolved in distilled water,
tion precipitated with acetate of
ecipitate is then diffused through
er, in a tall glass vessel, and sul-
ydrogen is passed through it, to
the lead; after which the liquor
, filtered, evaporated to the con-
thick syrup, and spread in a thin
n plates of glass, and allowed to
rent of warm air, or by a gentle
ove. The maceration in ether is
mitted.
canha, 1 part; rectified spirit
rts; make a tincture, distil off the
lve in cold distilled water, 5 parts;
lution, and evaporate, &c., as before.
the last.
d.) As the last, nearly.
dicinal or impure emetia is brown-
iquescent, and emetic in doses of

)—a. Ipecacuanha (in coarse pow-
, is digested ***for 24 hours in dis-***
parts; together with calcined magnesia, added in slight excess; the deposit is then thrown on a filter, washed carefully with very cold water, and dried; it is next dissolved in rectified spirit and neutralised with dilute sulphuric acid; the filtered solution is decoloured with animal charcoal, again filtered, and again precipitated by digestion with magnesia; the last deposit forms a colourless solution with rectified spirit, which, by gentle evaporation, gives up its emetia as a yellowish-white pulverulent mass, which may be rendered perfectly white by redissolving it in alcohol, &c., as before. The process is rendered easier by first digesting the powdered ipecacuanha in ether.

b. (P. Cod.) Alcoholic extract of ipecacuanha, 1 part; water, 10 parts; dissolve, filter; add calcined magnesia, 1 part; evaporate to dryness, wash the product on a filter with very cold water, 5 parts; dry it again, and dissolve it in boiling alcohol; evaporate the filtered tincture to dryness, redissolve the residuum in a little water, acidulate (slightly) with dilute sulphuric acid, decolour with animal charcoal, filter, precipitate with liquor of ammonia, and dry the precipitate by a gentle heat.

c. (Ph. Suec. 1845.) Powdered ipecacuanha, 1 part; water acidulated with sulphuric acid, 6 parts; digest, filter; add lime, 1 part, and evaporate to dryness over a water bath; the residuum is then exhausted with boiling rectified spirit, and otherwise treated as in the last formula.

Prop., &c. Pure emetia is white, pulverulent, inodorous, and bitter; fusible at 122° Fahr.; very soluble in alcohol and boiling water, but only slightly so in ether, oils, and cold water. It restores the blue colour of reddened litmus, and partially neutralises the acids, forming scarcely crystallisable salts. It is reddened by nitric acid, and this red colour is deepened by ammonia. Tincture of iodine produces a reddish precipitate in an alcoholic solution of emetia. With tincture of galls this solution behaves like morphia; but, unlike the last substance, the salts of iron produce no change of colour in it. These reactions, combined with its emetic properties, are sufficient for its identification.—*Dose.* White and pure emetia is emetic in doses of $\frac{1}{20}$ to $\frac{1}{16}$ gr. The large doses ordered in certain pharmaceutical compilations, evidently in error of the difference between the strengths of the pure and the impure or medicinal emetia, have, in several cases which have been reported on, produced very serious consequences.

EMET'ICS. *Syn.* VOMITS, ANACATHARTICS; ANACATHARTICA, EMETICA, VOMITORIA, L. Medicines which induce vomiting. The principal emetics are ipecacuanha and tartarised antimony, and their preparations; and the sulphates of zinc and copper. Of these the first is commonly employed either in substance or infused in wine (ipecacuanha wine), when *it is merely wished* to evacuate the contents *of the stomach,* when that organ is in a dis-

·red state or overloaded with food; and
ie one most adapted, in ordinary cases, for
dren and females. Tartar emetic (tarta-
d antimony) (dissolved in water) and anti-
ial wine, either alone or combined with
acuanha, are preferable at the commence-
t of fevers and other inflammatory disor-
, in consequence of the nausea, relaxation,
depression of the muscular power and
ulation which commonly follow their use.
en poison has been taken, sulphate of zinc
enerally preferred as an emetic, on account
the promptness and completeness of its
on, and its effects ceasing as soon as it is
ted from the stomach. Sulphate of copper
mployed in the same cases as sulphate of
, but its action is more violent and dis-
eable, whilst its intense metallic taste is a
it objection to its use. 25 to 30 grs. of
er of the above sulphates are dissolved in
4 fl. oz. of warm water, and a fourth of
solution is given every ten minutes, until
ous vomiting ensues. In the absence of
r substances, when an immediate emetic is
iired, a teaspoonful of flour of mustard (an
cle always at hand), stirred up with half a
of warm water, and drank at a draught,
generally act easily and effectively, and
eve the stomach before other remedies can
obtained and applied.

he operation of emetics is powerfully pro-
ed by drinking copiously of diluents, espe-
ly of warm or tepid water. The latter, in
, is itself an emetic, when taken in quan-
. Its use will also prevent that dreadful
ining and retching, which make emetics
nuch dreaded by the nervous and deli-
.

he timely administration of an emetic at
commencement of fevers and other inflam-
ory affections, will frequently cause copious
phoresis, and produce a cure, or at least
itly mitigate the severity of the symptoms.
psies have also been cured by vomiting;
swelled testicle, bubo, and other glandular
llings, have occasionally been dispersed by
action of emetics. Visceral obstructions,
both sexes, have also yielded to the same
itment. Small and repeated doses of
tics are frequently administered, with ad-
tage, to produce nausea, in many diseases
the lungs and stomach. Certain chronic
obstinate diseases, as rheumatism and
ıma, are sometimes relieved by emetics,
n every other line of treatment has
ed.

metics should be avoided in plethoric habits,
hernia, pregnancy, and whenever visceral
ımmation is suspected. They should also
given with great caution to young children
females, and to the nervous and delicate.
such cases, wine or powder of ipecacuanha
ıld alone be employed.

metic Cups. *Syn.* ANTIMONIAL CUPS;
ULA EMETICA, CALICES VOMITORII, L.
ll cups made of metallic antimony. Wine
left in them for 10 or 12 hours [illegible]
emetic.

Emetic Tartar. See ANTIMONY, TA[illegible]
ATED.

EM'ETINE. See EMETIA.

EMMEN'AGOGUES. *Syn.* EMMEN[illegible] L. Medicines which are considered [illegible] the power of promoting the mens[illegible] charge when either retained or sup[illegible] There are, probably, few remedies which [illegible] this specific power on the uterus, the [illegible] of repeated emmenagogues acting [illegible] their influence on the system generally, [illegible] parts contiguous to the uterus, than [illegible] uterus itself. Among the substances [illegible] arranged under this class are—aloes, [illegible] hellebore, birthwort, borax, cubebs, ergot, [illegible] boge, gin, iodide of potassium, iodine, [illegible] mercurials, the peppers, rue, savine, [illegible] (generally), stimulating diuretics, [illegible] goosefoot, stinking orache, wine, &c.

Of the above, ergot and madder [illegible] only articles which exercise a direct [illegible] the uterus, and that rather in incr[illegible] expulsive energy than in promoting the [illegible] strual function, though they are adv[illegible] ously employed for the latter purpose. [illegible] of the other substances named are [illegible] purgatives, or possess cerebro-spinal pro[illegible] or local powers of irritation, by which [illegible] increase the pelvic circulation, or produ[illegible] citement in the neighbouring parts, in [illegible] cases of a dangerous and irreparable chara[illegible] Hence many writers on pharmacology deny [illegible] existence of emmenagogues.

To ensure the successful administratio[illegible] this class of medicines, the system [illegible] previously prepared for their use by [illegible] rating it, if there is either relaxatio[illegible] debility; and an opposite course should [illegible] pursued when there is an undue deg[illegible] arterial action. In the majority of cases, [illegible] restoration of the discharge is rather [illegible] butable to a proper regulation of the [illegible] than to any specific power in the [illegible] administered.

EMOLL'IENTS. *Syn.* EMOLLIENTIA, L. [illegible] *pharmacy* and *therapeutics*, demulcents of [illegible] oleaginous, saponaceous, or emulsive charact[illegible] applied to surfaces (generally external), [illegible] soften and relax their fibres. See DEMULCENTS.

EMUL'SIN. *Syn.* SYNAPTASE. A[illegible] substance, forming a large proportion of the white pulp of both bitter and sweet almonds. It is yellowish-white, soluble in cold water, and coagulated by heat and alcohol. Its most remarkable property is its action on [illegible] by which the volatile oil of almonds and [illegible] cyanic acid, with other products, are [illegible] It has never been obtained in a [illegible] purity.

EMUL'SION. *Syn.* EMULSIO, L. A [illegible] fluid, formed by the mechanical admixt[illegible] oil and water, by means of some other [illegible] stance that possesses the power of [illegible]

emulsions of the Pharma-
e 'British Pharmacopœia' in-
s *Misturæ* (which *see*).
tion of emulsions, the oily or
nts are usually suspended by
ge of gum arabic, almonds, or
r. of the first, made with equal
d water; 1 oz. of the second
mber); and one in no. of the
drs. of any oil into an emulsion
. of water, gradually added. In
ad of the above substances, a
otassa is employed, by which a
lsion is formed. In all cases,
r other viscid substance should
mortar before anything else.
nous matter may then be very
d in, taking care not to add it
han it can be subdued by the
during this part of the manipu-
ture should begin to assume a
lling appearance at the edges,
f water must be immediately
ith it, before adding the re-
e oil. From the want of this
is common for an emulsion sud-
its tenacious consistence in the
is then in vain to endeavour to
fter the oil is thoroughly incor-
care is requisite to avoid sepa-
n by too hasty an effusion of the
r fluid of the mixture. If any
id liquid is to be added, it must
end of the process. Indeed, the
an acid liquid, even a slightly
p, will often entirely destroy an
ixtures of copaiba are frequently
the addition of spirit of nitric
fortune which might be avoided
ing it with one or two parts of

nt method of preparing emulsions
d gum-resins, is to put the article
le or wedgwood mortar, and to
about 4 times its weight of recti-
hich is then to be ignited, and the
urated until an equal consistence
. The liquid is then to be added
and the whole patiently triturated
until cold. Yolk of egg or mu-
y be added to the fluid resin or
, if desired, as in the common method,
ellent emulsion may be made without

ence of soluble salts in an emulsion
ccasion the separation of the oleagi-
ion. Spirit produces the same effect
hich are made with yolk or mucilage;
in those made with an alkali. The
of these substances to emulsions
e therefore avoided as much as pos-
mulsions of wax, spermaceti, oil of
, and balsam of copaiba, are the most
d completely formed with yolk of
tile oils are more *readily made into*
if mixed with an equal volume of

some simple fixed oil, before proceeding to operate on them. Scammony is generally formed into an emulsion with milk; and resin of jalap, with almonds and water.

The following formulæ, for certain emulsions, are merely given here for examples. Various others will be found under MIXTURE, LOTION, WASH, &c.

Emulsion of Al'monds. *Syn.* MILK OF ALMONDS, ALMOND MIXTURE; EMULSIO AMYGDALÆ, MISTURA A., L. *Prep.* 1. Blanched almonds, 1 oz.; beat them to a smooth paste, add, gradually, water, ½ pint; and when the whole is thoroughly incorporated, strain through a piece of gauze.

2. As the last, adding sugar, 1 oz.; or syrup (either simple or flavoured), 1½ fl. oz. See EMULSION OF OIL OF ALMONDS (*below*).

Emulsion of Assafœt'ida. *Syn.* EMULSIO ASSAFŒTIDÆ, MISTURA A., L. *Prep.* (Duclow.) Assafœtida, 1 oz.; powdered gum, 2 oz.; oil of almonds, 3½ fl. oz.; water, 6 fl. oz. Antispasmodic.—*Dose.* 1 or 2 table-spoonfuls; in hysterical affections, &c.

Emulsion of Cam'phor. *Syn.* EMULSIO CAMPHORÆ, E. CAMPHORATA, MISTURA CAMPHORÆ (Ph. E.), L. *Prep.* 1. (Ph. Castr. Ruth. 1840.) Camphor, ½ dr.; triturate with milk, ½ fl. oz., gradually added; then further add of water, 7½ fl. oz.

2. (Ph. E.) Camphor, 20 grs.; lump sugar, ½ oz.; triturate together, and add of blanched almonds, ½ oz.; again triturate, then gradually add of water, 1 pint. Stimulant, antispasmodic, and diaphoretic.—*Dose.* 1 fl. oz. to 2 fl. oz.

Emulsion of Cas'tor Oil. *Syn.* EMULSIO OLEI RICINI, MISTURA O. R., L. *Prep.* 1. Castor oil, 1 oz.; thick mucilage, 1½ oz.; syrup of orange peel, 1 fl. oz.; water, 6 fl. oz.

2. As the last, but using milk instead of water.—*Dose.* One third; as an aperient for females who object to taking the unprepared oil.

Emulsion of Copai'ba. *Syn.* EMULSION OF CAPIVI; EMULSIO COPAIBÆ, MISTURA C., L. *Prep.* 1. Balsam of copaiba and syrup of orange peel, of each, 2 oz.; yolks of 5 eggs; milk, 14 fl. oz.

2. (Beral.) Copaiba and mucilage, of each, 2 oz.; water, 12 fl. oz.—*Dose.* ½ oz. to 1 oz., 2 or 3 times a day; where the use of copaiba is indicated.

Emulsion of Gum. *Syn.* EMULSIO ACACIÆ, MISTURA ACACIÆ (Ph. E.), L. *Prep.* From sweet almonds (blanched), 10 drs.; white sugar, 5 drs.; mucilage, 3 fl. oz.; water, 1 quart. Demulcent. In coughs, &c., *ad libitum.*

Emulsion of Oil of Almonds. *Syn.* EMULSIO OLEI AMYGDALÆ, L. *Prep.* From oil of almonds, 3 drs.; thick mucilage and simple syrup, of each, 5 drs.; rose water, 1 fl. oz.; distilled water, 3 or 4 fl. oz. An elegant and efficient *substitute for almond milk.* See EMULSION *OF ALMONDS (above).*

Emulsion of Peru'vian Balsam. *Syn.* EMULSIO BALSAMICA, E. BALSAMI PERUVIANI, L. *Prep.* 1. As emulsion of copaiba.

2. (Hosp. F.) Balsam of Peru, ½ oz.; oil of almonds, 6 drs.; powdered gum, 1 oz.; triturate together, and add, gradually, rose water, 4 fl. oz.—*Dose.* 1 or 2 table-spoonfuls; in old asthmas, chronic coughs, winter coughs, &c.

Emulsion of Scam'mony. *Syn.* EMULSIO SCAMMONII, MISTURA S. (Ph. E.), L. *Prep.* 1. (Ph. E.) Resin of scammony, 7 grs.; new milk, 3 fl. oz. For a dose.

2. (Planche.) Aleppo scammony, 7 grs.; sugar, 2 drs.; new milk, 3 fl. oz.; cherry-laurel water, 5 drops. For a dose. Purgative; in torpor of the intestines, dropsy, worms, &c. The formula of the Paris Codex is similar.

Emulsion of Spermace'ti. *Syn.* EMULSIO CETACEI, MISTURA C., L. *Prep.* As emulsion of wax. Demulcent.

Emulsion of Tur'pentine. *Syn.* EMULSIO TEREBINTHINÆ, MISTURA T., L. *Prep.* 1. Chio turpentine, 2 drs.; white sugar, 1 oz.; yolk of 1 egg; milk of almonds, 4 fl. oz. In gleets.—*Dose.* 2 table-spoonfuls, 3 or 4 times a day.

2. (Clossius.) Venice turpentine, 1½ dr.; yolk of 1 egg; peppermint water, 4½ fl. oz. (See *below.*)

Emulsion of Oil of Turpentine. *Syn.* EMULSIO OLEI TEREBINTHINÆ, MISTURA O. T., L. *Prep.* (Carmichael.) Rectified oil of turpentine, 1 fl. oz.; yolk of 2 eggs; emulsion of almonds, 4 fl. oz.; syrup of orange peel, 2 fl. oz.; spirit of lavender, 4 fl. drs.; oil of cinnamon, 5 or 6 drops.—*Dose.* 1 fl. oz., twice or thrice a day; in nephritic pains, and that variety of ophthalmia termed iriditis. (See *above.*)

Emulsion of Wax. *Syn.* EMULSIO CERÆ, E. CERÆ ALBÆ, MISTURA C., LAC C., L. *Prep.* (Guibourt.) White wax, 1 oz.; powdered gum, 1½ dr.; water, 24 fl. oz.; simple syrup, 4 fl. oz.; put the syrup and gum into a warm mortar, add the wax, and triturate with a warm pestle until united; then add the water (warm) gradually, and continue the agitation till the whole is quite cold. Demulcent. *Ad libitum.*

ENAM'EL. A species of vitreous varnish, coloured with metallic oxides, applied in a thin stratum to brightly polished metallic surfaces (copper or gold), on which it is fused by the flame of a lamp urged by the blowpipe, or by the heat of a small furnace.

The basis of all enamels is a highly transparent and fusible glass, called 'frit,' 'flux,' or 'paste,' which readily receives a colour on the addition of metallic oxides. It may be made by one or other of the following formulæ:—

Prep. 1. Red lead, 16 parts; calcined borax, 3 parts; powdered flint glass, 12 parts; powdered flints, 4 parts; fuse in a Hessian
crucible for 12 hours, then pour
water, and reduce it to a powder
ware mortar.

2. Tin, 3 parts; lead, 10 parts;
in an iron pot at a dull cherry-
scrape off the oxide as it forms,
obtain it quite free from undecom
then reduce it to fine powder by
elutriation. In this state it is
enamellers as 'flux' or 'calcine.'
this 'calcine' are next mixed w
weight of pure sand or powder
1 part of sea salt, or other alk
the mixture is then partially fus
sian crucible, by which it und
vitrification.

3. (Chaptal.) Lead and tin,
calcine as above, and take of the
or 'calcine' and ground flints, of
pure carbonate of potash, 2 par
ceed as before.

4. (Wynn.) Flint glass, 3 oz.;
oz.; as last.

5. (Wynn.) Red lead, 18 parts
calcined), 11 parts; flint glass,
last.

6. (Wynn.) Powdered flints, 10
and white arsenic, of each, 1 part;

Obs. The precise qualities of
of the above processes depend
the duration and degree of hea
By increasing the quantity of san
flux, the enamel is rendered more
the opacity and whiteness is incre
addition of oxide of tin. The
should be avoided, or it should be
ingly, as it is apt to make the enam
and lose colour.

Enamel, Black. *Prep.* 1. Cal
(protoxide), 12 parts; oxide of cob
mix, add an equal weight of whi
fuse, as before.

2. (Clouet.) Pure clay, 3 parts;
iron, 1 part. A fine black.

3. Peroxide of manganese, 3 p
1 part; mix, and add it, as requir
flux.

Enamel, Blue. *Prep.* 1. Whit
'flux,' coloured with oxide of cobal

2. Sand, red lead, and nitre,
parts; flint glass or ground flint
oxide of cobalt, 1 part, more or le
ing on the desired depth of colour.

Enamel, Brown. *Prep.* 1. M
parts; red lead, 16 parts; flint
parts; as before.

2. (Wynn.) Manganese, 9 parts
34 parts; flint powder, 16 parts.

3. Red lead and calcined iron,
part; antimony, litharge, and san
parts. To be added in any require
to white 'frit,' according to the col
A little oxide of cobalt or zaffre i
added to alter the shade.

Enamel, Green. *Prep.* 1. 'Flu
2 lbs.; black oxide of copper, 1 oz.

, but adding red oxide of iron,
sive.
t and litharge, of each, 2 oz.;
and, 4 oz.; 'flux' or 'frit,'

sparent 'frit,' any quantity;
ium, q. s. to colour. Colour
tand a great heat; in common
, it frequently turns on the

t 'flux,' 5 oz.; black oxide of
0 grs.; oxide of chromium, 2
the emerald.
and yellow enamel mixed in
portions.
. *Prep.* Blue enamel, 2 parts;
enamel, of each, 1 part. See

ge. *Prep.* 1. Red lead, 12
ate of iron and oxide of anti-
part; flint powder, 3 parts;
, powder, and melt with 'flux,'

ed lead, 12 parts; oxide of
s; flint powder, 3 parts; red
n, 1 part; calcine, then add
to every 2 parts of this mix-

ple. *Prep.* 1. 'Flux' or 'frit,'
ide of gold, purple precipitate
roxide of manganese.
itre, green vitriol, antimony,
n, of each, 1 lb.; red lead, 60
, cool, powder, and add rose
e), 19 oz.; zaffre, 1 oz.; crocus
borax, 3 oz.; and of a com-
of gold, silver, and mercury,
rring the melted mass with a
the time, then place it in cru-
bmit them to the action of a
furnace for 24 hours. This is
purple enamel used in the mo-
St. Peter's at Rome.
. *Prep.* 1. 'Paste' or 'flux,'
the red oxide or protoxide of
ld the colour pass into the green
m the partial peroxidation of
from the heat being raised too
colour may be restored by the
y carbonaceous matter, as tallow,

ging the glass or 'flux' with the
s of gold, or with the purple pre-
cassius. These substances produce
ed, inclining to crimson or purple
exquisite hue. The enamel often
the fire quite colourless, and after-
ives its rich hue at the lamp.
) Sulphate of iron (calcined
rt; a mixture of 6 parts of 'flux'
d 1 of colcothar, 3 parts. Dark

) Red sulphate of iron, 2 parts;
1), 6 parts; white lead, 3 parts.

Prep. Purple enamel

(or its elements), 3 parts; 'flux,' 90 parts; mix, and add silver leaf or oxide of silver, 1 part, or less.

Enamel, Transpa″rent. The 'frit' or 'flux' described *above*.

Enamel, Vi′olet. *Prep.* 1. Purple enamel, 2 parts; red enamel (No. 2), 3 parts; 'frit,' 6 parts.

2. Saline or alkaline 'frit' or 'flux,' any quantity; peroxide of manganese, q. s. to colour. As the tint depends on the metal being at the maximum of oxidation, contact with oily or carbonaceous substances should be particularly avoided.

Enamel, White. *Prep.* 1. 'Calcine' (from 2 parts of tin and 1 part of lead), 1 part; fine crystal glass or 'frit,' 2 parts; manganese, a few grains; powder, mix, melt, and pour the fused mass into clean water; again powder, and fuse, and repeat the whole process 3 or 4 times, avoiding contamination with smoke, dirt, or oxide of iron. A fine dead white.

2. Washed diaphoretic antimony, 1 part; fine glass (free from lead), 3 parts; mix, and proceed as before. Very fine.

3. Lead, 30 parts; tin, 33 parts; calcine as before, then fuse 50 parts of this 'calcine' with an equal weight of flints, in powder, and 100 parts of salt of tartar. A fine dead white enamel.

Obs. For white enamel, the articles must be perfectly free from foreign admixture, as this would impart a colour. When well managed, either of the above forms will produce a paste that will rival the OPAL.

Enamel, Yel′low. Superior yellow enamels are less easily produced than those of most other colours; they require very little flux, and that mostly of a metallic nature. The following come highly recommended by experienced artists:—

Prep. 1. From 'frit' or 'flux,' fused with oxide of lead, and a little red oxide of iron.

2. Lead, tin ashes, litharge, antimony, and sand, of each, 1 oz.; nitre, 4 oz.; mix, fuse, and powder; and add the product to 'flux' or 'frit,' q. s.

3. White oxide of antimony, alum, and sal-ammoniac, of each, 1 part; pure carbonate of lead, 1 to 3 parts, or q. s. (all in powder); mix, and expose them to a heat sufficiently high to decompose the sal-ammoniac. *Used* as the last. Very bright coloured.

4. (Wynn.) Red lead, 8 oz.; oxide of antimony, and tin, calcined together, of each, 1 oz.; mix, and add of 'flux' (No. 5), 15 oz.; mix well and fuse.

5. Pure oxide of silver added to the metallic 'fluxes.' The salts of silver are also used, but are more difficult to manage. If a thin film of oxide of silver be spread over the surface of the enamel to be coloured, exposed to a moderate heat, then withdrawn, and the film of reduced silver on the surface removed, the *part under will be found tinged of a fine yellow. (Clouet.)*

ENCAU'STIC. See PAINTING (Encaustic).

ENE'MA. *Syn.* CLYSTER; EN'EMA (*pl.* ENEM'ATA), L. A medicine, usually liquid (sometimes gaseous), thrown into the rectum or lower bowels.

Clysters usually consist of some weak glutinous or mucilaginous fluid, to which the active ingredients are added; or a decoction or infusion is made of the medicaments, which is then used, either alone, or after the addition of a little gum, starch, or sugar. The proper vehicle for astringent vegetable matter, metallic salts, and the mineral acids, is pure water. Oleaginous and resinous substances are made into emulsions before being employed for enemas. In all cases the fluid is administered warm. The quantity of fluid forming a clyster, for an adult, may vary from ½ to ¾ pint; that for an infant within a month old, should be about 1 fl. oz.; for a child of one year, about 2½ fl. oz.; from one to seven years, from 3 or 4 fl. oz.; and from seven to twelve or fourteen, 6 or 7 fl. oz.; after that age to puberty, ½ pint may be employed.

The quantity or dose of the active ingredients in a clyster should be 4 or 5 times as great as that of the same medicines when taken by the mouth; as it is generally regarded that the susceptibility of the rectum is only ⅕th that of the stomach, and that to exert a like absorbent action it occupies 5 times as long as the latter viscus. The dose, and the interval between its repetition, should, therefore, be proportionately increased. Narcotics, as opium, tobacco, &c., should, however, be given in only twice or thrice the quantity that would be exhibited in the usual manner.

Enemata are usually administered by means of a syringe, bladder, or elastic bag, furnished with a rectum tube; but many ingenious and elegant pieces of mechanism, adapted for self-administration, are made by the instrument makers. Great care should be taken to avoid injuring the coats of the rectum by the use of a rough or improperly shaped pipe, or one that is too long. The extremity of the pipe or tube should also be perfectly smooth and well rounded (rather spherical than pointed), and in using it no force should be employed. A neglect of this point often produces very serious consequences, especially in young children.

Tobacco smoke may be administered by means of a double pair of bellows, supplied with air from a small funnel under which the herb is burning,—and gaseous matter, by connecting the rectum tube with a small gasometer, exerting a trifling pressure on the confined gas.

The number of substances employed in the preparation of enemata is very great. The following are some of them, arranged according to their effects:—

1. (Anodyne and Narcotic.) Opium, henbane, &c., are employed to allay spasms of the bowels, stomach, uterus, bladder, &c.

2. (Aperient or Cathartic.) Aloes, colocynth,
senna, various purging salts, g
marshmallows, decoction of
water, &c., are commonly emp
the peristaltic action of th
destroy worms.

3. (Demulcent and Emolli
of starch, gum, isinglass, glue,
or combined with opium, are
the coats of the intestines, a
tion; and also to restrain dia
when combined with astring
catechu, or oak bark.

4. (Nutrient.) Animal jell
milks, &c., are frequently use
convey nourishment to the bo

5. (Sedative.) Tobacco inf
and tartar emetic (in solutic
to relax the powers of the
spasms, depress the circulatio
syncope.

Enemata or clysters are no
employed in our large towns,
the higher classes; but a grea
among many persons against
from a fastidious and mistake
introduction of improved a
years, by which the adminis
remedies is attended with le
exposure than formerly, has r
the repugnance which previou

Clysters are invaluable whe
to evacuate the bowels as spe
and when the stomach will n
ministration of a purgative b
well as in cases requiring a di
of the lower bowels, as in dyse
As a mere laxative, an injectio
milk-and-water, or water grue
be found sufficient. By the a
table-spoonfuls of common sal
salad oil, or molasses, to this la
will form an excellent purgative
in most cases, induce a full di
cases, the patient should be di
the injection for as long a time
not to attempt to empty his bow
after the reception of the medi
tation of the bladder, rectum
anodyne injection or enema oft
relief. In diseases of the lowe
are also of almost indispensabl
in the dislodgment of ascarid
rectum; nor are they less be
cases of sudden sinking of th
where deglutition is impossi
prompt stimulating impressio
save the patient; under such
clysters of some of the diffusib
proved of the greatest benefit.'

The injection of large qua
matter into the bowels, as well
use of clysters (even of warm
deemed by the highest medic
be injurious, and, occasionally,
practice should not, therefore,
grow into a habit. The

a stimulant cease to act without
se remarks apply to aperients
outh.
g formulæ embrace the whole
ENEMATA) of the 'British Phar-
vell as a few others in common

lbu'men. *Syn.* ENEMA ALBU-
p. (Ricord.) Infusion of linseed,
s of 2 or 3 eggs; mix. In
ea, and as a nutrient clyster in
stomach diseases. The reason
he yolks of the eggs is not very
preparation is much more effec-
.

oes. *Syn.* ENEMA ALOËS (B.P.),
m aloes, 2 scrup.; carbonate of
s.; mucilage of starch, ½ pint.
tonic amenorrhœa, &c. It should
ed when irritability of the rec-
r genitals, exists; nor in piles,
is a tendency to prolapsus ani or
.

dyne. See ENEMA OF OPIUM.

spasmod'ic. *Syn.* ENEMA ANTI-
L. *Prep.* From tincture of
fl. drs.; laudanum, 30 to 60
gruel or barley water, ½ pint.
affections of the bowels. (See

safœt'ida. *Syn.* FETID CLYSTER,
IC C.; ENEMA ASSAFŒTIDA (B.
DUM (Ph. E. & D.), L. *Prep.* 1.
etida, 30 grs.; water, 4 oz.; rub
mixed.
To cathartic enema (Ph. E.), add
assafœtida, 2 fl. drs.
Warm water, 12 fl. oz.; tincture
2 fl. drs.
Hosp.) Assafœtida, 2 drs.; yolk
arley water, 7 fl. oz. Stimulant,
c, and carminative. An excellent
hysteria, flatulent colic, hooping-
ntile convulsions, worms in the
els, &c. See HOOPING-COUGH

strin"gent. *Syn.* ENEMA ASTRIN-
Prep. 1. Tincture of catechu, 1
ley water, 9 fl. oz.
ct of rhatany, 2 drs.; syrup, or made
; water, 7 fl. oz.
tion of galls, oak-bark, pomegranate,
le astringent substance, 3 or 4 fl. oz.;
arley water, 6 or 7 fl. oz.
p. F.) Electuary of catechu, 2 drs.;
l lime water, of each, 4½ fl. oz. In
&c., arising from a relaxed condition
nts of the lower bowels; and in
f the anus, &c.

of Cam'phor. *Syn.* ENEMA CAM-
Prep. 1. Camphor liniment, 4 fl.
ks of 2 eggs; water gruel, 7 fl. oz.
phor, 1 dr.; rectified spirit, 2 drs.;
till dissolved, then add, gradually,
syrup, 1 oz.; when thoroughly *in-*
further add of thin gruel, 7 fl. oz.
Anodyne, antispasmodic, and diuretic. In difficult or obstructed micturition.

Enema of Cas'tor Oil. *Syn.* ENEMA OLEI RICINI, L. *Prep.* 1. (Hosp. F.) Castor oil and mucilage, of each, 1 oz.; gruel, ½ pint.

2. Castor oil, 1 oz.; liquor potassa, 2 fl. dr.; triturate, and add of honey, 1 oz.; when mixed, further add of hot gruel, ½ pint; and agitate until cool enough to be administered.

Enema, Cathar'tic. *Syn.* PURGATIVE CLYSTER; ENEMA CATHARTICUM (B. P., Ph. E. & D.), E. LAXATIVUM, E. PURGATIVUM, L. These have been already alluded to. By increasing the quantity of the active ingredients, a mild laxative or aperient clyster is converted into an active purgative or cathartic one.

Prep. 1. (Ph. E.) Senna, ½ oz.; boiling water, 16 fl. oz.; infuse an hour, then add of Epsom salts, ½ oz.; sugar, 1 oz.; when dissolved, further add of olive oil, 1 oz.; and mix them by agitation.

2. (Ph. D.) Epsom salts, 1 oz.; olive oil, 1 fl. oz.; mucilage of barley, 16 fl. oz. Same as enema of sulphate of magnesia, B. P., except that in the latter mucilage of starch is substituted for mucilage of barley.

3. (Ph. D. 1826.) Manna, 1 oz.; compound decoction of chamomile, ½ pint; dissolve, and add, of olive oil, 1 oz.; Epsom salts, ½ oz.

4. Compound decoction of mallows, ½ pint; Epsom salts, ¾ oz.; sweet oil, 2 fl. oz.; mix, as above.

Obs. The above are employed in all ordinary cases where the use of an immediate carthartic is indicated.

Enema of Chlo"ride of Lime. *Syn.* ENEMA CHLORIDI CALCIS, E. ANTIPUTRESCENS, L. *Prep.* 1. Chloride of lime, 10 grs.; tepid water, 1 fl. oz.; triturate, then add of barley water, or plain tepid water, 7 fl. oz.

2. (Pereira.) Chloride of lime, 10 to 15 grs., added to a common enema. As a deodoriser, when the alvine evacuations are unusually fetid.

Enema for Col'ic. *Syn.* ENEMA ANTICOLICUM, L. *Prep.* From oil of cajeput or peppermint, 15 drops; dissolved in sweet spirit of nitre, 60 drops; laudanum, 35 drops; infusion of chamomile, ½ pint.

Enema of Col'ocynth. *Syn.* ENEMA COLOCYNTHIDIS (Ph. L.), L. *Prep.* 1. (Ph. L.) Extract of colocynth, ½ dr.; soft soap, 1 oz.; triturate, and add of water, 1 pint.

2. (Ph. L. 1836.) As the last, but using compound extract of colocynth.

3. (Guy's Hosp.) Colocynth pulp, 1 dr.; water, ¾ pint; boil so as to strain ½ pint; and add of common salt, ½ oz.; syrup of buckthorn, 1 fl. oz. An efficient enema in colic and obstinate constipation, in the absence of spasms and inflammatory symptoms.

Enema, Com'mon. *Syn.* ENEMA COMMUNE, *L. Gruel or barley* water, either with or without the addition of a little common salt or oil, are generally so called. The first are simply laxative; the latter, purgative. Decoction of mallows, linseed tea, or water gruel, are also commonly used as the vehicle.

Prep. 1. (St. B. Hosp.) Barley water, 1 pint; common salt, 1 oz.; dissolve.

2. (Guy's Hosp.) Water gruel, 10 to 15 fl. oz.; common salt, 1 oz.

3. (U. C. Hosp.) Water gruel, 8 to 12 fl. oz.; salt, 1 oz.; linseed oil, 2 fl. oz.

Enema of Copai'ba. *Syn.* ENEMA COPAIBÆ, L. *Prep.* 1. From balsam of copaiba, 2 drs.; liquor opii sedativus, 15 drops; yolk of egg, q. s.; barley water, 7½ fl. oz.

2. (Collier.) To the last add, of extract of opium, 1 gr.; oil of turpentine, 4 fl. drs.

3. (Velpeau.) Copaiba, 2 drs.; laudanum, 20 drops; yolk of 1 egg; water gruel, 8 fl. oz. In ascarides, gonorrhœa, and some affections of the lower bowels and bladder, when the stomach rejects the balsam.

Enema, Domes'tic. *Syn.* ENEMA DOMESTICUM, L. This name has been applied to an enema of warm water, either with or without the addition of a little sugar, honey, or milk. The effect is laxative.

Enema, Emoll'ient. *Syn.* ENEMA EMOLLIENS, E. DEMULCENS, L. *Prep.* From decoction of linseed, barley, or starch, 1 pint; linseed or olive oil, 1 oz. Soothing and laxative; in excoriations of the lower bowels. 20 to 40 drops of laudanum may be added when there is much pain or looseness.

Enema, Feb'rifuge. *Syn.* ENEMA FEBRIFUGUM, L. *Prep.* 1. (Collier.) Water gruel, 12 fl. oz.; sugar, 1 fl. oz. In low fevers.

2. (Brande.) Vinegar, 2 fl. oz.; infusion of chamomile, 5 or 6 fl. oz. In typhus.

Enema, Fe'tid. See ENEMA OF ASSAFŒTIDA.

Enema for Hoo'ping-cough. *Syn.* ENEMA PERTUSSICULARE, L. *Prep.* 1. See ASSAFŒTIDA ENEMA.

2. (M. Reiken). Assafœtida, 8 grs.; yolk of 1 egg; water, ½ pint.

Obs. This quantity is sufficient for 10 or 12 clysters for children under 1 year; 5 or 6 for those under 3 years; and 2 or 3 for those under 7. Two clysters are prescribed daily in hooping-cough. According to M. Reiken, this is more successful in removing hooping-cough than any other remedy. To ensure success, it should not be administered until the feverish symptoms have passed. M. Reiken sometimes uses an ointment of assafœtida as well as the clyster.

Enema, Lax'ative. See ENEMAS (Cathartic, Common, &c.).

Enema of Lead. *Syn.* ENEMA PLUMBI, L. *Prep.* (Dr. Newbold.) Acetate of lead, 6 grs.; tepid distilled water, 6 fl. oz. In strangulated hernia; repeated in two or three hours.

Enema, Nu'trient. *Syn.* FEEDING CLYSTER; ENEMA NUTRIENS, L. *Prep.* 1. Strong beef tea, 12 fl. oz.; thickened a little with arrow-root or hartshorn shavings.

2. (M. Nasse) Strong meat
dilute hydrochloric acid, ½ fl. d

3. Yolks of 2 eggs; brown
oil, of each, 1 oz.; mutton broth
nourish the body, when alim
taken or retained by the stoma

Enema, Oi'ly. See ENEMA (

Enema of O'pium. *Syn.* E
E. OPII (B. P. and Ph. L.), E
DYNUM (Ph. E.), L. *Prep.* 1.
cilage of starch, 2 fl. oz.; tinct
dr.

2. (Ph. E.) Starch, ½ dr.;
2 fl. oz.; mix, and when cool
tincture of opium, ½ to 1 fl. dr.

3. (Ph. D. 1826.) Laudanu
water, 6 fl. oz.

Obs. The above are the ord
leges, but in practice the quanti
is frequently doubled; this sh
be done with great care. Opiu
used in dysentery, colic, chole
painful affections of the inte
&c. The bowels should be
their administration, and in infla
plaints they should not be used
hours. Clysters containing op
small quantities, are dangerou
young children; yet there are
they sometimes succeed when e
medy has failed. This is part
the low chronic diarrhœa of inf
childhood. A case of this kin
the family of the writer. The
attendant, as well as the physicia
abandoned the little sufferer
inevitable death, as beyond the
ther assistance. A small opium
given, and the child recovered.

Enema of Ox-gall. *Syn.* ENE
F. BOVIS, L. *Prep.* (Dr. Allnatt
gall, 2 fl. oz.; water gruel, 8 fl.

2. (Dr. Clay.) Ox-gall, 2 f
4 or 5 fl. oz. To soften ind
and in costiveness arising from
bile.

Enema of Pop'pies. *Syn.* ENEM
L. *Prep.* 1. DECOCTION OF P

2. Poppy-heads (with the se
water, ¾ pint; boil to 12 fl. o
Anodyne; as a substitute for opi

Enema, Pur'gative. See CATH
(*above*).

Enema, Sim'ple. Barley wate
thin-made starch, and decoctio
are frequently so called, from bei
for simple laxative enemas, or
for more active substances.

Enema of Soap. *Syn.* ENEM
Prep. (St. B. Hosp.) Soft soa
water, 1 pint; dissolve. To sof
fæces, &c.; and as a deterge
ulcerations of the rectum.

Enema of Starch. *Syn.* ENE
See SIMPLE ENEMA (*above*).

Enema, Stim'ulant. *Syn.* E

ordinary cathartic clysters are
L. The following belong to a
:—
incture of capsicum, 1 fl. oz.;
r thin arrow-root, ½ pint; mix.
ecially the cold stages.
t add, of ether, 2 fl. drs.; lauda-
.
of poppies, ½ pint; tincture of
drs.; oil of nutmeg, 10 drops.

obac'co. *Syn.* ENEMA TABACI
D.), INFUSUM TABACI (Ph. D.
p. 1. (B. P.) Tobacco leaf, 20
ater, 8 oz.; infuse half an hour,

Tobacco, 15 to 30 grs.; boiling
; as last.
Tobacco, 1 scrup.; boiling water,

1836.) Tobacco, 1 dr.; boiling

o clyster is used in strangulated
ate constipation, retention of
is violently depressing and re-
cing fainting, and even death,
erly or injudiciously adminis-
not to be forgotten that 2 drs.,
n ½ dr., of tobacco, infused in
proved fatal." "The cautious
herefore, will not use more than
' (Pereira.) Three parts of Vir-
are equal to seven parts of any
Davy.)
Tur'pentine. *Syn.* TURPENTINE
NEMA TEREBINTHINÆ (Ph. L.),
Prep. 1. (B. P.) Oil of tur-
; mucilage of starch, 15 oz.
) Oil of turpentine, 1 fl. oz.; yolk
riturate together, then add of de-
rley, 19 fl. oz.
) As the last, but using simple
d of barley water.
D.) Oil of turpentine, 1 fl. oz.;
f barley, 16 fl. oz.
eligan.) Oil of turpentine, ½ fl. oz.;
arlic, 1 fl. oz.; barley water, 6 or 7
ascarides, and as an antispasmodic
tive in colic, obstinate constipation,
eritonitis, tympanitis (DRUM-BELLY),

Ver'mifuge. *Syn.* ENEMA ANTHEL-
, E. VERMIFUGUM, L. *Prep.* 1. Cas-
z.; mucilage, ½ oz.; decoction of the
male fern, 7 fl. oz. In worms; espe-
e-worm.
ker.) Oil of turpentine, 1 fl. oz.;
worm), ½ pint. In ascarides.
Darwall.) Tincture of sesquichlo-
ron, 1 dr.; water, 7 or 8 fl. oz. In
especially when occurring in child-
quantity used being proportionately
See ENEMAS of ALOES, ASSAFŒTIDA,
, &c.
of Wine. *Syn.* ENEMA VINOSUM, L.
the sherry wine and hot water, of

each, 7 fl. oz. In suspended animation. Sometimes a wine-glassful of brandy is added.

ENGRA'VING. The art of producing designs or figures on metal, wood, &c., by incision or corrosion, usually for the purpose of being subsequently printed on paper, calico, or other materials. The mechanical operations of the engraver do not come within the province of this work. Several of the materials which he employs in his trade will, however, be found noticed under their respective heads.

There is this important difference between engraving on metal plates and wood-engraving: in the former all the lines and dots that are to print black are hollowed out with a graving-tool, or 'bitten in' by acid; in the latter all the parts that are to appear white in the impression are cut away, and the lines which produce the imprint are left on the face of the block.

Casts of wood-blocks, or 'stereos,' are often used instead of the original blocks when a great number of impressions is required. To produce them stucco moulds are prepared, and from these the casts in type metal are taken. The casts are usually about ⅛ in. thick, and have to be screwed upon wooden blocks to bring them to the height of the types which are printed with them. As soon as one cast is worn out another may be taken, and the original block is thus preserved in the state in which it left the engraver's hands.

For the reproduction of engraved metallic plates the ELECTROTYPE PROCESS is commonly employed. Woodcuts are also copied, though less frequently, by this process. The mode by which the postage-stamp plates are multiplied is as follows:—240 'queen's heads' or stamps (a pound's worth) are engraved on one steel plate. This plate is then hardened, and an impression of it taken on a softened steel roller. This roller, in its turn, is also hardened, and softened steel plates being passed under it, an impression precisely like that of the original plate is produced on each of them. These plates are then hardened and employed for printing the penny postage stamps for sale. They last a long time; and when they are worn out they are destroyed, and their place is supplied by fresh ones, which are produced by the cylinder before referred to, which continues ready to supply any number that may be required. Bank-note plates are reproduced in the same manner. See ELECTROTYPE, ETCHING, &c.

ENTERI'TIS. See INFLAMMATION OF THE BOWELS.

ENTOZO'A. Parasitic animals which infest the bodies of other animals. See WORMS.

ENURE'SIS. See URINE.

EPHIAL'TES. See NIGHTMARE.

EPIDEM'IC. Common to many people. In *pathology*, an epidemic disease (EPIDEMIC; EPIDEMY) is one which seizes a number of people *at the same time* and in the same place, *but which is not* dependent on any local cause, but on some extraordinary condition of the air. When a disease is peculiar to a people or nation, and appears to depend on local causes, it is said to be 'ENDEMIC' or 'ENCHORIAL.' Thus, Asiatic cholera may be taken as an example of the first, and the agues of low countries, and the goitre of the Alps, as examples of the other.

EPIGAS'TRIC. In *anatomy*, pertaining to the EPIGAS'TRIUM, or the part of the abdomen over the stomach.

EPILEP'SY. *Syn.* FALLING SICKNESS; EPILEPSIA, MORBUS CADUCUS, L. The popular name of this disease arises from the patient, when attacked by it, suddenly falling to the ground. The other leading symptoms consist of convulsions, stupor, and, generally, frothing at the mouth. It comes on by fits, which after a time go off, leaving a certain amount of lassitude and drowsiness behind. Sometimes certain peculiar symptoms precede the attack. Among these, a sensation of coldness or of a current of cold air from the extremities of the body towards the head (AURA EPILEPTICA), palpitation, flatulency, stupor, and an indescribable cloud or depression, are the most common. The occurrence of these symptoms are not, however, uniform, even in the same patient; but it generally happens that the party falls down suddenly, and without the slightest warning.

Epilepsy is often symptomatic of other affections, as excessive irritation of the primæ viæ from worms, indigestible or noxious food, or poison; or it depends on local injuries, particularly those of the head, accompanied with lodgments of water on the brain, tumours, pressure, &c. Violent affections of the nervous system, sudden frights or fits of passion, violent mental emotions, the sudden suppression of old evacuations, and in childhood difficult teething, are also common causes of sympathetic epilepsy. Occasionally it arises from mobility of the sensorium, induced by plethora, or by excessive debility. In such cases the treatment must be energetically directed to the removal of the exciting cause.

When epilepsy occurs as an idiopathic or primary affection, or cannot be referred to any apparent cause, more especially when the attack commences about the age of puberty, and the fits are frequent, it is generally hereditary, and there is great danger of its terminating either in apoplexy, or lunacy, or imbecility.

The treatment of idiopathic epilepsy is principally directed to the improvement of the general health, and the diminution of nervous irritability by sedatives and tonics. Among the first, camphor, ether, henbane, hemlock, musk, oil of cajeput, opium, and morphia, and, more recently, hydrocyanic acid, have been principally relied on. Among the second, bark, cascarilla, quinine, strychnia, valerian, the sulphate of iron, zinc, and copper, arsenious acid, and nitrate of silver, have each their zealous advocates. The objectio
last preparation is the danger of
the patient, by tinging the skin c
dull, leaden hue. In cases acc
plethora, a low diet, daily out-of
and the frequent use of aperie
sional blistering, cupping, and
measures, are indicated; wh
marked by inanition and debili
opposite course must be adopt
disease is complicated with s
course of mercury may be giv
with scrofula, iodine, iodide of
cod-liver oil, assisted by sea-b
proper.

Among other methods of tre
mentioned the administration
emetic or purgative, twice w
morning, when the stomach i
first has now few supporters;
is said to be often product
benefit.

During a fit of epilepsy the
can be done for the patient is
sufferer injuring himself, and
part of his dress that presses on
or chest. When premonitory s
a brisk emetic, a large dose of
ether, a cold plunge or shower
contra-indicated), or anythin
gives a sudden shock to the s
its tone, frequently prevents t
the fit.

Epilepsy more frequently a
than adults, and boys than gi
turns are (frequently) periodic
roxysms commence more freq
night than in the day, being
nected with sleep." It is some
feited by street impostors in o
the charity of the passers-by.

EPIPAS'TICS. See BLISTER

EP'ITHEM. *Syn.* EPITHE
external liquid medicine for loc
as an embrocation or lotion.
confine the term to those prep
are intended to be applied by m
dipped into them. See LINIMEN

Epithem, Astrin"gent. *Syn.*
STRINGENS, L. *Prep.* 1. Powde
powdered catechu, 1 dr.; mix.

2. (Brera.) Powdered bole
each, 1 oz.; vinegar of roses,
paste. Both are applied to t
forehead to stop bleeding at the

Epithem, Gly"cerin. *Syn.* E
CERINÆ, L. *Prep.* (Mr. Start
1 oz.; rose water and lime water
4 fl. oz.; powdered gum traga
form a thin mucilage. In scal
excoriations.

Epithem, Vesica'ting. *Syn*
VESICATORIUM, L. *Prep.* 1. (A
barley meal, made into a paste
and 30 to 40 grs. or more of pow
flies sprinkled over the surface.

L. 1746.) Spanish flies (in fine d wheat flour, equal parts, made into h vinegar, q. s. As a blister.

, **Vol'atile.** *Syn.* Epithema vo- ammoniæ, L. *Prep.* (Ph. L. 1764.) turpentine and water of ammonia, a. An excellent counter-irritant; or without the addition of a little

EQUISE'TIC ACID. In *chemistry*, a substance identical with aconitic acid (which *see*).

EQUIV'ALENT. (Equivalency.) In modern *chemistry*, the equivalent of a body is that weight of it which will exactly replace in a compound 1 atom of hydrogen or 1 atom of either of the other monivalent elements (*see* Table, *below*).

Table of the Elements, arranged according to their Equivalency.

nt.	Divalent.	Trivalent.	Tetrivalent.	Pentivalent.	Hexivalent.
rn	Oxygen	Boron	Carbon	Nitrogen	Sulphur
,	Barium	Gold	Silicon	Phosphorus	Selenium
,	Strontium		Tin	Vanadium	Tellurium
;	Calcium		Titaneum	Arsenic	Tungsten
	Magnesium		Thorinum	Antimony	Molybdenum
	Zinc		Niobium	Bismuth	Osmium
m	Didymium		Tantalum		Iridium
um	Lanthanium		Zirconium		Ruthenium
	Yttrium		Aluminium		Rhodium
a	Glucinum		Platinum		Chromium
a	Cadmium		Palladium		Manganese
	Mercury		Lead		Iron
	Copper				Cobalt
					Nickel
					Uranium
					Cerium

lent elements are those which replace atom of hydrogen in chemical comin the ratios of their atomic weights. of a divalent, trivalent, tetrivalent, nt, and hexivalent element replaces ely, or is equivalent to, two, three, , or six atoms of hydrogen or of any nivalent element. (For further in- on this subject consult the works on y by Fownes, Miller, Kay-Shuttle- e.)

IUM. According to Prof. Mosander, stance usually called yttria is a mixture oxides of three metals—yttrium, erbium, bium, which differ in the character of lts, and in some other important par- . The first is a powerful base; the very weak ones. The latter are sepa- with extreme difficulty, and possess no al importance.

EMACAU'SIS. Slow burning; decay. expression was applied by Liebig to peculiar decomposition which moist or- matter undergoes, when freely exposed e air, by the oxygen of which it is ally burned or destroyed, without any ble elevation of temperature. See Pu- y.

Syn. Ergot of rye, Spurred e., Cockspur r., Obstetrical a (B.P.), L. The diseased seeds of ale (Linn.), or common rye.

of rye deteriorates greatly by age, being subject to the attacks of a description of acarus resembling the cheese mite, but much smaller, which destroys the whole of the internal portion of the grain, leaving nothing but the shell, and a considerable quantity of excrementitious matter. To prevent this, the ergot should be well dried, and then placed in bottles or tin canisters, and closely preserved from the air. The addition of a few cloves, or drops of the oil of cloves, or strong acetic acid, or a little camphor, or camphorated spirit of wine, will preserve this substance for years in close vessels. M. Martin proposes to steep the dry ergot in strong mucilage, and then to dry it on a sheet of white iron. This operation he repeats once or oftener, and finally preserves the prepared and thoroughly dried ergot in a well-corked glass flask. ('Jour. de Chimie Méd.') The wholesale druggists generally keep it in well-covered tin canisters or tin boxes.

Ergot of rye is much used to restrain uterine hemorrhage, and to accelerate the contraction of the uterus in protracted labour. It is also much used as an emmenagogue.—*Dose.* To facilitate labour, 20 to 30 grs., either in powder or made into an infusion; repeated at intervals of 20 or 30 minutes until 3 or 4 scruples have been taken. In other cases (leucorrhœa, hemorrhages, &c.) the *dose* is 5 to 12 grs., three times daily, for a period not longer than a *week or ten days at a time.* See Decoction, *Extract*, Infusion, Oil, Tincture, &c.

ER'GOTINE. *Syn.* Ergotina, L. *Prep.* 1. (Bonjean's.) Powdered ergot is exhausted with cold water, by displacement, and the resulting solution is heated in a water bath to about 200° Fahr., and filtered; the filtered liquor is then evaporated to the consistence of a syrup, and when cold, is treated with rectified spirit, in considerable excess, to precipitate its gummy matter; after repose, the clear portion is decanted, by the heat of a water bath, to the consistence of a soft extract. *Prod.* 15%. According to M. Bonjean, this preparation possesses all the 'hæmostatic' without any of the 'poisonous' qualities of ergot. It has a reddish-brown colour, a bitter taste, and an odour somewhat resembling that of roasted meat. Its aqueous solution is red, limpid, and transparent. *Dose.* 4 to 10 grs., either made into a pill or dissolved in water.

2. (Wigger's.) Powdered ergot is first digested in ether, to remove the fatty matter, and then in boiling alcohol; the alcoholic tincture is evaporated, and the resulting extract treated with water; the undissolved portion, dissolved in hot alcohol and filtered, yields pure ergotine by gentle evaporation. *Prod.* 1⅛%. It has a brownish-red colour; is resinous, acrid, bitter, insoluble in water and ether, soluble in alcohol, and poisonous. It evolves a peculiar odour when warmed. Its therapeutical action has not been determined. See Extract.

ER'RHINES. *Syn.* Errhina, L. Substances applied to the pituitary membrane of the nose, for the purpose of producing an increased discharge of nasal mucus. When they are given to excite sneezing, they are called sternutatories or ptarmics. Asarabacca, euphorbium, several of the *labiatæ* (herbæ *vel* flores), sal-ammoniac, powdered sugar, subsulphate of mercury, tobacco, and white hellebore, are the principal substances of this class.

Errhines act as local irritants, and are occasionally employed in chronic affections of the eyes, face, ears and brain; as in amaurosis, ophthalmia, deafness, weak sight, headache, &c.

Errhine, Al'um. *Syn.* Errhinum aluminis, L. *Prep.* (Radius.) Alum and Armenian bole, of each, 1 dr.; kino, ½ dr.; red oxide of iron, 2 drs.; (all in powder;) mix and triturate. In bleeding at the nose. A little is snuffed up the nostrils.

Errhine, Hæmostat'ic. *Syn.* Errhinum hæmostaticus, L. *Prep.* From powdered catechu, 1 dr.; opium, 5 grs.; sugar, 2 drs. As the last.

ERUPTIONS (of the Skin). For brevity and convenience, these cutaneous affections may be divided into 5 classes:—

Eruptions, Animal'cular. These are due to the presence of minute parasites (acari), which burrow and breed in the scarf-skin, and occasion much local irritation. See Itch.

***Eruptions*, Pap'ular.** *Syn.* Dry pimples. In these the surface is raised into
vations or pimples, which somet
themselves on the surface, and at
only appreciable by the touch.
usually accompanied with a grea
degree of cutaneous irritation and t
itching, in attempting to relieve w
are frequently converted into disg
painful sores and excoriations, which
difficult to heal.

Treat. In simple cases, where th
much disarrangement of the gene
these eruptions commonly yield to
sional use of mild saline aperients,
or tepid bathing, or frequent ablu
warm soap and water. Sea-bathing
powerful remedy. Stimulants of
should be avoided, and ripe fruit
tables should form a prominent pa
diet. Lemonade, made by squeezing
into a tumbler of water, and sweet
mixture with a little sugar, is one of
beverages on these occasions. To r
itching, brisk friction with a soft
may be had recourse to, followed by th
a lotion formed by adding the juice of
or a wine-glassful of distilled vinegar,
pint or a pint of water, either with or
the addition of a table-spoonful of g
Occasional single pimples, depending
causes, generally require no particular
ment. See Lichen, Prurigo, Red G
Toothrash.

Eruptions, Pus'tular. *Syn.* Matter
ples. These are distinguished by the
(pustules) containing an opaque yell
or matter (pus, lymph). "They are
rally developed on a ground of inflam
and the degree of this inflammation
skin is the basis of their division int
groups, termed technically 'impetigo'
'ecthyma.' The former presents the
degree of inflammation, and, sometimes,
is scarcely any redness of the skin; the
is always accompanied by considerable
mation and redness." "The little
attain their full size in the course of
three days, and either dry up without
or more frequently burst and then dry,
ing a hard crust, which offers consid
variety of colour, being sometimes yell
sometimes brownish, and sometimes
black." The latter form is popularly
as 'crusted tetter.' In ecthyma the
"are generally of the size of a split
surrounded at their base by a broad
redness. They are usually separate,
tered like impetigo, scattered over
parts of the body, and followed eithe
hard black crust or by a sore."

Treat. The inflammation and pain
generally alleviated by the applicatio
lotion formed of rectified spirit of
part; and water, 5 or 6 parts; to
table-spoonful of distilled vinegar is
added. The crusts or scabs, when the

troublesome, may be removed by
ntation or an emollient poultice;
: cerate being afterwards applied
tion. When the constitution is
mmatory (as it usually is in im-
letive treatment may be adopted;
r and debilitated (as it usually is
tonics and a more liberal diet,
use of lemon juice diluted with
everage, should be had recourse
ing is also highly useful. See

Sca'ly. *Syn.* DRY TETTER. This
f inflammatory condition of the
RMA), which commonly makes its
s a small dull red, salmon-red, or
d spot, slightly raised above the
surrounding skin, constituting a
imple-like prominence, about the
t pea. Upon the surface of this
the scarf-skin becomes slightly
and after a little while a very
circular scale is produced, which
thickness by the addition of fresh
after assuming various colours in
rieties of the disease, ultimately
d falls off, either leaving a perma-
surface, or being followed by crops
ke scales, which also fall off, and
l in rapid succession. This class of
s more obstinate than any of the
ties, and often defies medical skill.
ular form generally requires special
In all, however, endeavours should
restore the general health of the
e manner which existing circum-
y indicate. The red meats, ripe
ntiscorbutic vegetables, should form
tion of the diet; and sea-bathing,
, sulphuretted, or ioduretted baths,
taken daily, if possible. Dry fric-
a flesh-brush, and daily exercise to
n, are also highly recommended.
OSY, PSORIASIS, TETTERS, &c.

s, Vesic'ular. *Syn.* WATERY PIM-
hese consist of little vesicles or blad-
d with a small quantity of a trans-
d colourless liquid. They result from
r action to that which produces ordi-
les. Inflammation is excited in the
t skin by an inward or outward cause,
inflamed vessels pour out the watery
the blood, and so raise the scarf-skin
f the sensitive layer, in the form of a
me, which in some situations is conical,
r a segment of a sphere." They pre-
at variety in point of number and size;
e so minute as to be scarcely discernible
t close inspection, whilst others increase
magnitude of a hen's egg. They are
s in the inverse ratio of their size;
ller ones being very abundant, and the
es scanty and few.

t. This consists chiefly in the due at-
l to the general *principles of health*—
exercise, food, and raiment, as

already pointed out, assisted by such special remedies as the particular case or circumstances may demand. Antiphlogistics or tonics must be had recourse to, according to the condition of the system, and local irritation allayed by the usual means. Simple cases frequently yield to a dose or two of some saline aperient and a change of diet. See ERYSIPELAS, PEMPHIGUS, RUPIA, TETTERS, and SKIN.

ERVALEN'TA. The meal of lentils (*Ervum lens*,—Linn.), variously doctored with other substances. In some cases the article sold under the name does not contain a particle of lentil meal.

Prep. 1. (Paris Ervalenta.) Indian-corn meal (fine), and bean flour, of each, 14 lbs.; salt and sugar, of each, 1 lb.; mix, and pass the compound through a sieve.

2. (Warton's.) Lentil powder, 1 part; durra or Turkey millet flour (*Sorghum vulgare*), 2 parts. Some persons assert that it contains a large quantity of the flour of Indian corn. See REVALENTA and LENTILS.

ERYN''GO. *Syn.* ERYNGIUM, L. The root of the *Eryngium campestre*, a plant common in middle and southern Europe. It is sweet, aromatic, and tonic, and formerly enjoyed much repute in gonorrhœa, suppressed menstruation, and visceral obstructions generally, especially those of the gall-bladder, liver, and uterus. Candied eryngo (ERYNGIUM CONDITUM, ERYNGII RADIX CONDITA), according to Lindley, "has the credit of being a decided aphrodisiac," and has a considerable sale. *Eryngium aquaticum* (bitter snake-weed) and *E. maritimum* (sea eryngo, sea holly) furnish the eryngo of the Ph. U. S. See CANDY.

ERYSIP'ELAS. *Syn.* ST. ANTHONY'S FIRE, THE ROSE. A peculiar form of inflammation, which chiefly attacks the skin, and is generally accompanied or followed by an eruption of a very red colour, sometimes vesicular, and by tumefaction. It commonly attacks the head and face, and is at its height from the third to the sixth day, but the duration and progress of the symptoms are variable. From the eighth to the twelfth day the eruption usually scabs or scales off. Sometimes suppuration occurs, especially of the eyelids and scalp, and during the latter stages of the disease there is, in general, a tendency to debility. In many cases erysipelas is attended by typhoid symptoms, and is then a dangerous and often fatal disease.

Treat. Aperients and diaphoretics, assisted by a cooling diet. When the inflammatory symptoms run high, blistering and cupping are frequently had recourse to. Local irritation may be subdued by milk-and-water, or cooling or evaporating lotions, or by sprinkling starch, hair-powder, or arrow-root, on the part. The tendency to debility in the latter stages should be combated with bark, quinine, or *other like tonics.* When shiverings, sickness, *and delirium,* attend the height of the disorder, wine, bark, ammonia, and other stimulants, are usually prescribed, and depletion must be avoided. The same treatment is also adopted in the gangrenous forms of the disease, to which doses of opium and calomel are also commonly added. When suppuration and sloughing of the cellular membrane have taken place, it is usual to make incisions to give exit to the discharge, and relieve the tension of the limb. These may be about 1½ inch in length, and from 2 to 4 inches apart, and should be made in the direction of the long dimensions of the limb. Mr. Higginbottom, of Nottingham, applies (freely) lunar caustic to the inflamed skin, and also to the healthy skin, to the extent of an inch or more beyond it. The result, in many cases, is a complete change of action in the part, and a resolution of the disease. Iodine paint is often successfully used in the same way.

Erysipelas is generally symptomatic of a debilitated or bad constitution. It is also a common sequel of surgical operations in crowded and ill-ventilated hospitals, where it often appears to be contagious. In these cases cleanliness, ventilation, and change of air, are the only remedies. We need scarcely add, that this disease should never be tampered with, but the best medical advice sought, whenever it can be procured.

ERYTHORE'TIN. *Syn.* Red resin of rhubarb. A yellow or reddish-yellow substance, forming one of the three resins found by Schlösberger and Dœpping in rhubarb. It is very soluble in alcohol; less so in ether; with ammonia and potassa it forms soluble compounds of a rich purple colour. See Rhubarb.

ERYTH'RIC ACID. *Prep.* The lichen *Roccella tinctoria* (Canary or herb-archil) is boiled with milk of lime, and the filtered solution precipitated with hydrochloric acid; the dried precipitate is dissolved in warm alcohol, and filtered; as the solution cools, crystals of erythric acid are deposited.

Prep., &c. Feebly acid; colourless; inodorous; scarcely soluble in water; soluble in alcohol and ether; chloride of lime turns its solutions of a blood-red colour.

ERYTH'RINE, Amarythrine, Erythriline, Pseudo-erythrine, and Telerythrine. Substances obtained by Kane and Heeren from *Roccella tinctoria, Parmelia roccella, Leconara Tartarea,* &c. They are of little practical importance.

ESCHAROT'ICS. *Syn.* Escharotica, L. Substances that destroy the texture of living organic bodies, with the production of an 'eschar' or 'scab.' Escharotics have been divided into two classes—*mechanical* and *chemical.* Among the former are actual cauteries, as a heated iron, moxas, &c.; among the latter are all those substances commonly known as caustics. Some writers have subdivided chemical escharotics into eroding escharotics, as *blue vitriol,* red precipitate, burnt alum,
&c.; and into caustic eschar
caustic, pure potassa, strong
nitric acid, &c.; but these disti
little practical value. "In cau
heated iron, this should be at a
at this temperature, it occasio
the patient, from its causing
death of the parts to which
"The surrounding surface shou
by some non-conductor of he
wet paper or cloth, as the sud
of steam will produce a bl
around the burn, and will mu
pain." (Dr. R. E. Griffith.)
Solution, &c.

ES'CULENTS. Substances
The more important esculen
under their respective heads.

ESCU'LIC ACID. A peculia
M. Bussy in the bark of the
It is but little known, and has
to any use.

ESPRIT. [Fr.] Spirit.
commonly applied to alcoholi
the essential oils, and to vario
aromatic essences sold by the
druggists as articles of th
Essence, Spirit, &c.

ES'SENCE. *Syn.* Essentia,
and characteristic portion of
that on which its most remark
depend. The term has bee
applied to various preparation
contain these essential princip
disencumbered of grosser ma
systematic writers generally res
cation to the volatile oils obtai
table substances by distillation,
solution of them in alcohol. In
perfumery, the word 'essence' is
centrated preparations that dif
each other. Thus, concentrate
coctions, liquors, solutions, and
frequently called 'essences' by t
them; but the term 'fluid extr
more appropriate, if those alre
are not deemed sufficiently sho
tive. We shall here confine
brief notice of the principal com
or those that undergo some prep
being merely extracted from
distillation along with water.
be considered under the article

The concentrated preparatio
maceutist, termed 'essences,' a
pared by digesting the active
ingredients in rectified spirit o
with or without the addition
portion of water; or they are ext
formed by dissolving a portion o
oil of such substances in the spiri
are made the essences of laven
ger, &c. When it is desired onl
aromatic and volatile portion of t
the latter are usually digested i
a few days, and then submitted

comes over loaded with aroma-
r other volatile matter. In this
l most of the fragrant essences
r and druggist, when simple
essential oils in alcohol is not
. many cases the active princi-
edients are partly volatile and
it least do not readily volatilise
ture at which alcohol distils
he case, for instance, with the
of ergot and Jamaica ginger.
gestion alone should be adopted.
ciple of organic substances, of
sired to obtain a concentrated
esinous or oily, or little soluble
(which is mostly the case), the
fied spirit of wine should alone
In the preparation of essences
tion, the method by percolation
t is preferable to that of simple
d expression, when the nature
lients and other circumstances
licable, as it is not only more
t a more concentrated solution
e obtained. At the same time,
reader should remember, that
perating requires much greater
l skill to ensure success than the
d. This clumsiness of manipu-
common cause of the failures
frequently met with in the pre-
ese articles.
dients for the preparation of
t undergo the same operations of
wdering, or slicing, as directed
TURE,' previous to digestion in the
er menstruum; and the length of
hould be allowed to infuse, when
alone is adopted, should not be
n days; but this time may be ad-
y extended to a fortnight, or even
ring the whole of this period fre-
tion should be employed, and when
nts are so bulky as to absorb the
he fluid, the vessel which contains
d be securely fastened by a bung
covered with bladder, and inverted
nate day. By this means every
the ingredients will be equally ex-
he action of the menstruum. In all
the method of displacement, or per-
s preferable. For the essences used
es and for flavouring, not only must
be perfectly tasteless and scentless,
st be also quite devoid of colour.
lowing formulæ embrace most of the
met with in the shops. Those not
ong them may be readily prepared
g the general directions given above,
ploying the formula given for the
n of the essence of some similar sub-
mply varying the characteristic in-
. Thus, were it desired to form an
of ambergris or of myrrh, and no
ould be found *for these preparations,*
self consider *in what menstruum*

the active principles of these substances were most soluble. This, he would immediately see by reference to their properties, is rectified spirit of wine. He would next have to decide on the proper strength of his essence. In this he must be guided, either by the strength of the like preparations of other makers, or by his own judgment of what would be useful, novel, or convenient. Suppose he decided that his essence should represent 1-10th of its weight of the solid ingredient. He would then take 2 oz. of ambergris or myrrh, and 20 oz. of rectified spirit, which he would digest together for 10 days or a fortnight in the manner described above. Had the required preparation been an essence of senna, (for example), he would probably recollect, or might easily ascertain by reference, that the active properties of senna are soluble in both water and weak spirit. Then, to make an essence 4 times as strong as the tincture of the pharmacopœia, 7 oz. of senna, and 1 pint of proof spirit, should be employed, with due digestion, as before.[1] The same applies to other preparations. See CONCENTRATION, DECOCTION, INFUSION, LIQUOR, SPIRIT, TINCTURE, &c.

Essence of Ac'onite. *Syn.* ESSENTIA ACONITI, L. *Prep.* From aconite (herb, dried and powdered), 8 oz.; rectified spirit, 16 oz.; macerate for 4 days at a temperature of 68° Fahr., press, and strain; the marc or residuum is again macerated with (a little) spirit, and pressed as before, so that the weight of the mixed tinctures may amount to double that of the herb.—*Dose.* 3 to 6 drops. See TINCTURE.

Essence of All'spice. *Syn.* ESSENCE OF PIMENTO; ESSENTIA PIMENTÆ, L. *Prep.* From essential oil of pimento or allspice, 1 fl. oz.; strongest rectified spirit of wine, 1 pint; agitate until perfectly united, and the next day decant the clear portion, if there is any sediment. *Used* to make pimento water, and by cooks and confectioners as a 'flavouring.'

Essence of Al'monds. *Syn.* ESSENCE OF BITTER ALMONDS, E. OF PEACH KERNELS, E. OF RATAFIA, E. OF NOYEAU, QUINTESSENCE OF N., ALMOND FLAVOUR; ESSENTIA AMYGDALÆ, E. A. AMARÆ, L. *Prep.* 1. From essential oil of almonds, as the last.

2. (Pereira.) Essential oil of almonds, 1 fl. oz.; rectified spirit, 7 fl. oz.

Uses, &c. It is added to wine, cordials, perfumery, pastry, &c., to impart an agreeable nutty flavour or aroma. It is also employed to prepare cherry-laurel, peach-kernel, and bitter-almond water. A large quantity is consumed by the confectioners, and by wine merchants to 'improve' their sherries, and to give Cape wine a sherry flavour. It should be used in very small quantities, as it is very powerful, and, in quantity, poisonous. A few drops are sufficient for several pounds of pastry. The first formula is that used in trade. The second is *sometimes* used by the druggists, and is *occasionally* vended under the name of 'CON-

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[1] *See directions* given under TINCTURE.

CENTRATED ESSENCE OF BITTER ALMONDS,' &c. The directions for purifying the almond oil from hydrocyanic acid before dissolving it in the spirit, given in more than one recent book of receipts, are absurd, as in this way the oil loses much of its characteristic odour and flavour, and by keeping gradually becomes nearly destitute of both. See ESSENTIAL OIL.

Essence of Am'bergris. *Syn.* ESSENTIA AMBRÆ-GRISEÆ, E. A. SIMPLEX, TINCTURA A. CONCENTRATA, L. *Prep.* 1. Ambergris (cut very small), 5 drs.; rectified spirit, 1 pint; place them in a strong bottle or tin can, secure the mouth very firmly, and expose it to the heat of the sun, or in an equally warm situation, for 1 or 2 months, frequently shaking it during the time; lastly, decant, and filter through paper.

2. (Guibourt.) Ambergris, 1 dr.; rectified spirit, 3 oz.; digest 10 or 12 days.

3. (Redwood.) Ambergris, 2½ drs.; rectified spirit, 1 pint; macerate for 14 days. Chiefly used as an element in other perfumes. The first is the formula employed by the London houses.

Essence of Ambergris and Musk. *Syn.* CONCENTRATED TINCTURE OF A. AND M.; E. AMBRÆ-GRISEÆ (ODORATA), E. A. ET MOSCHI, E. REGIA, L.; ESSENCE ROYALE, Fr. *Prep.* 1. Ambergris (cut small), ¾ oz.; 1 or 2 fresh-emptied musk-pods (or musk, 12 grs.); rectified spirit, 1 pint; proceed as in No. 1 (*above*).

2. Ambergris, 2½ oz.; bladder musk, ½ oz.; spirit of ambrette (purple sweet sultan), 1 gal.; as last.

3. Ambergris, 2½ oz.; bladder musk, 1 oz.; spirit of ambrette, 1 gal.; as before. The fragrance of the above, especially of the last two, is very powerful, and is much esteemed.

4. Ambergris, ½ oz.; musk and lump sugar, of each, ¼ oz.; triturate together in a wedgwood-ware mortar, adding oil of cloves, 20 drops; true balsam of Peru, 30 drops, and enough essence of jasmine or tuberose to convert it into a perfectly smooth paste; then put it into a strong bottle with rectified spirit, 1 quart; observing, before adding the whole of the last, to rinse the mortar out well with it, that nothing may be lost; lastly digest for 6 or 8 weeks, as directed in No. 1 (*above*).

5. Ambergris, 4 drs.; musk, 1½ dr.; sand, 3 oz.; triturate, then add, of oil of cinnamon, 1 dr.; oil of rhodium, ½ dr.; essence of roses and eau fleurs d'orange, of each, ¼ pint; rectified spirit, 1½ pint; digest as before (or not less than 14 days), and decant and filter. The last two are very fine, though inferior to Nos. 2 and 3.

6. To the last (No. 5), add civet, 1 dr.; salt of tartar, 3 drs.; and an additional pint of rectified spirit. Inferior to the above, but cheaper.

Obs. Essence of ambergris is used as a perfume, and is added in small quantities to sweet-scented spirits and wines, to improve *their flavour* and aroma. A very small quantity of any one of them add
water, eau de Cologne, tooth
powder, wash-balls, or a hog
communicates a delicious fragr
BERGRIS and ESSENCE ROYALE

Essence d'Ambrette. [Fr.]
OF MUSK SEED, SPIRIT OF M. S.
BRETTE, Fr. *Prep.* 1. Musk s
a clean pepper-mill), 1¼ lb.; r
pints; digest for 3 or 4 wee
place, and filter.

2. Musk seed, 4 lbs.; rectifie
digest 10 days, add water, 2 q
over 1 gal. Very fine.

Essence of Ammoni'acum.
TRATED TINCTURE OF AMMONIA
AMMONIACI, TINCTURA A. CO
Prep. 1. Ammoniacum (in
bruised in a very cold marble m
its weight of coarse and well-
sand or powdered glass, and
½ pint, gradually added; the
continued until the whole i
smooth paste, and is then pla
mouthed bottle, and spirit of wi
ther added; the whole is then
ther for a week with constant
after sufficient repose to settle,
transparent liquid is decante
bottle for use.

2. Gum ammoniacum, 1 lb.,
cream with boiling water, ¾ pi
the mixture has cooled a little,
strong bottle, and rectified spi
pint, is cautiously added; the
corked down close, and the w
for a few days; the bottle is
moderately warm situation, tha
may subside, after which the cl
poured off through flannel into

Obs. This preparation is used
for the gum in substance, for ext
preparing emulsion of ammoni
of a., &c. It is represented to p
same amount of medicinal virt
weight of the solid gum, on w
has a considerable sale. The
first formula, when well manag
ful pale brownish-coloured, tr
ture; that of the second is
sightly. The preparation gener
the name of 'CONCENTRATED ES
MONIACUM' (ESSENTIA AMMO
TRATA, L.), and represented as
as the gum in substance, is gen
by the first formula given abov
OF AMMONIACUM. A stronger
prepared by a similar process, b
ammoniacum to a pint of the str
spirit. As, however, a clear
strength is somewhat difficult t
very seldom attempted by the d
therefore generally content th
sending out the liquid at half
strength, leaving the label to c
tional concentration. See AM

Ancho'vies. *Syn.* ESSENTIA
Prep. 1. Anchovies, 1 lb., are
ed to a pulp in a wedgwood-
mortar, and passed through a
rass-wire sieve; meanwhile the
ner portion that will not pass
ieve are boiled with water, 1
minutes, and strained; to the
, salt and flour, of each, 2½ oz.,
the pulped anchovies, are added,
simmered for 3 or 4 minutes,
l is removed from the fire, and
e mixture has cooled a little,
g vinegar, ½ pint, is mixed in; it
l, and the corks tied over with
either 'waxed' or 'capsuled.'
. (nearly).
s, 7 lbs.; water, 9 pints; salt and
1 lb. *Product*, 20 lbs.
st, add of Cayenne pepper, ¼ oz.;
lemon (grated), and mushroom
Very savoury.
itish anchovies (pickled sprats)
ards, along with herring liquor,
gs of anchovy barrels.
s a sauce and condiment; when
it has a fine flavour. That of
ally coloured with Venetian red
ole. An infusion of cochineal, or
, would form a more appropriate
l would be perfectly harmless.
and SAUCE.

Angel'ica. *Syn.* ESSENTIA AN-
rep. (Van Mons.) Angelica root
art; rectified spirit, 8 parts;
a; digest, and distil over 6 parts;
rminative, and alexipharmic.—
easpoonfuls.

An'iseed. *Syn.* ESSENTIA ANISI
SPRIT D'ANISE, Fr. Oil of anise,
ied spirit, 4 parts; mix (B. P.).
omatic, and carminative.—*Dose.*
ms. *Used* also to flavour liqueurs,
aniseed water. See SPIRIT.

'odyne. *Syn.* ESSENTIA ANODYNA,
1. Hard aqueous extract of opium
1 dr.; powdered cinnamon, ½ dr.;
it, 1 fl. oz.; digest a week.—*Dose.*
s.
t of henbane (recent), 5 drs.; rec-
, 2 fl. oz.; as last.—*Dose.* 10 to 30
rcotic, sedative, and antispasmodic.
cellent preparations.

Antihyster'ic. *Syn.* ESSENTIA ANTI-
, L. *Prep.* 1. Cyanuret of potas-
.; powdered sugar, 1 dr.; rectified
ua d'orange, of each 4 fl. drs.; agi-
er until dissolved.—*Dose.* 10 to 20
ne water; in hysteria, gastrodynia,
DRAUGHT (Antihysteric).
ld.) Resembles FETID SPIRIT OF
(which see).

'Apple. *Syn.* SOLUTION OF VALE-
OF AMYL; ESSENTIA POMI ODO-
Prep. From apple oil (valerianate
of amyl), as ESSENCE OF AL-MONDS. *Used* to flavour liqueurs and confectionery.

Essence of Ar'nica. *Syn.* ESSENTIA ARNICÆ, E. A. FLORUM, TINCTURA A. E. CONCENTRATA, L. *Prep.* (Ph. Baden, 1841.) From arnica flowers, as ESSENCE OF ACONITE. It represents half its weight of herb.

Essence, Aromat'ic. *Syn.* ESSENTIA AROMATICA, L. *Prep.* From hay saffron, 1 dr.; and rectified spirit, 6 fl. drs.; digested together; to the filtered tincture is added oil of cinnamon and powdered white sugar, of each, 1 dr.; ether (rect.), 2 fl. drs.; oil of nutmeg and essence of ginger, of each, ½ dr.; after agitation and a few days' repose, the clear portion is decanted into a stoppered phial.—*Dose.* 5 to 15 drops, on sugar or in a glass of wine or weak spirit; in cholera, diarrhœa, spasms, &c.

Essence of Bark. *Syn.* ESSENTIA CINCHONÆ, E. CORTICIS C., L. *Prep.* 1. Resinous extract of yellow bark, 4 drs.; rectified spirit, 1½ fl. oz.; tincture of orange peel, ½ fl. oz.; acetic acid (Ph. L.), 1 fl. dr.; digest a week.

2. Disulphate of quinine, ½ dr.; resinous extract of bark, 2 drs.; rectified spirit, 2 fl. oz.; as before.—*Dose.* 12 drops to a teaspoonful; as a febrifuge and tonic.

Essence of Beef. *Syn.* ESSENCE OF RED MEATS, &c. *Prep.* 1. From lean beef (chopped small), 1 lb.; water, ½ pint; place them in a bottle, which they will only half fill, and agitate them violently for half an hour; then throw the whole on a sieve, and receive the liquid in a jug; next boil the undissolved portion in water, 1 pint, for 20 minutes; strain, mix the decoction with the cold infusion, evaporate the liquid to the consistence of a thin syrup, adding spice, salt, &c., to taste, and pour the essence, whilst boiling hot, into bottles, jars, or (still better) tin cans, which must then be at once hermetically corked, sealed, or soldered up, and stowed away in a cold place. In this state it will keep a long time.

2. (Ellis.) Take of lean beef (sliced), a sufficient quantity to fill the body of a porter bottle; cork it up loosely, and place it in a pot of cold water, attaching the neck, by means of a string, to the handle of the pot; boil for 1½ to 2 hours, then decant the liquid and skim it. Spices, salt, wine, brandy, &c., may be added as before. Highly nutritious and sustaining.

Essence of Ber'gamot. See OIL (Volatile).

Essence, Bit'ter. *Syn.* ESSENTIA AMARA, L. *Prep.* (Ph. Den.) Wormwood, 4 parts; gentian root, bitter orange peel, and blessed thistle, of each, 1 part; rectified spirit, 45 parts; digest a week. Tonic and stomachic.—*Dose.* ½ dr. to 2 drs.

Essence of Calum'ba. *Syn.* ESSENTIA CALUMBÆ, L. See INFUSION OF CALUMBA.

Essence of Cam'phor. *Syn.* CAMPHOR DROPS, LIQUOR OF CAMPHOR, CONCENTRATED ESSENCE OF C., CONCENTRATED SOLUTION OF C., CONC. CAMPHOR JULEP; ESSENTIA CAMPHORÆ, LIQUOR C., L. C. CONCENTRATUS, L. *Prep.* 1. Camphor (clean), 4½ oz.; rectified spirit, 1 gal.; dissolve. This forms the 'ESSENCE OF CAMPHOR' and 'LIQUOR CAMPHORÆ' of the wholesale houses. About ¼ fl. dr., added to 7¾ fl. drs. of cold distilled water, forms (by agitation) a transparent aqueous solution of camphor, fully equal in strength to the filtered 'MISTURA CAMPHORÆ' (camphor julep) of the Ph. L. The above made with weaker spirit forms the 'spirit of wine and camphor' of the shops.

2. Camphor, 1 oz.; rectified spirit, 10 oz. (by weight); dissolve. This forms the 'CONCENTRATED ESSENCE OF CAMPHOR' of the wholesale druggists. 10 or 12 drops, added to 1 fl. oz. of pure cold water, make a transparent camphor julep, as before. There is a large quantity of these solutions of camphor sold by the London houses, who charge a considerable price for them. They are very convenient for preparing extemporaneous camphor julep or camphor mixture in dispensing.

3. (Fordred.) Tincture of camphor, 13 fl. drs.; tincture of myrrh, ½ fl. dr.; rectified spirit, 18½ fl. drs.; mix. 1 fl. dr., added to 4 fl. oz. of water, forms camphor julep. It has been proposed to bleach the tincture of myrrh with animal charcoal, but this interferes with its proper action.

4. (Homœopathic.) See CHOLERA REMEDIES, Nos. 6 & 7, page 335.

5. (Houlton.) Spirit of camphor (Ph. L.), 1 fl. oz.; proof spirit, 7 fl. oz. 1 fl. dr., to 3 fl. oz. of water, forms 'CAMPHOR JULEP.'

6. (Redwood.) Camphor, 1 dr.; rectified spirit, 2½ oz.; dissolve, and add of water, ½ oz.

7. (Swediaur.) Powdered camphor, 1 dr.; water saturated with carbonic acid gas, 12 fl. oz.; dissolve. 1 part of this solution, added to 4 parts of water, forms 'CAMPHOR MIXTURE.' See CAMPHOR.

Essence of Cap'sicum. See ESSENCE OF CAYENNE.

Essence of Car'away. *Syn.* ESSENTIA CARUI, L. *Prep.* From oil of caraway, as ESSENCE OF ALMONDS. Its applications and uses are similar. An inferior kind is prepared by macerating the seeds in proof spirit.

Essence of Car'damoms. *Syn.* ESSENTIA CARDAMOMI, E. C. CONCENTRATA, L. *Prep.* From lesser cardamom seeds (ground in a pepper mill), 5½ lbs.; rectified spirit of wine, 1 gal.; digest for a fortnight, press, and filter.

Obs. This preparation is very convenient for flavouring cordials, pastry, &c., and is very powerful. In the laboratory, it is frequently substituted for powdered cardamoms in making compound extract of colocynth, and has the advantage of adding no inert matter to the preparation, whilst it imparts the characteristic odour of the seeds in a remarkable degree. When used in this way, it is not added to the extract until it is nearly cold and about to be taken from the pan. The testæ or shells of the seed should be separated from the kernels, as the former are quite inert, and if used occasion a loss of spirit for no purpose.

Essence of Cascarill'la. *Syn.*
CARILLÆ, L. *Prep.* 1. Cascari
12 oz.; proof spirit, 1 pint;
digestion or percolation. The
times the strength of the infusi
(Ph. L.).

2. See INFUSION (Concentrat

Essence of Cas'sia. *Syn.*
L. *Prep.* From oil of cassia,
allspice or almonds.

Essence of Cayenne'. *Syn.*
CAYENNE PEPPER, E. OF CAPSI
TRATED E. OF C.; ESSENTIA CAP
CAPSICI CONCENTRATA, L. *Pr*
cum (recent dried pods, bruised),
fied spirit, 1 gal.; digest 14
filter. Some persons prepare it
of displacement.

2. Capsicum, ¼ lb.; proof
digest, as before. Weaker than

3. (Kitchener's.) Cayenne
brandy, 1 pint; digest, &c., as

Obs. The product of the fir
transparent, dark-coloured liqu
intensely burning taste. One d
to deprive a person of the power
several seconds; and a few drop
the rich pungency of cayenne to
tity of soup, sauce, or any othe
forms the 'ESSENCE OF CAYE
'CONC. ESS. OF CAYENNE PEPPE
don houses. It is principally used
ing,' and to make SOLUBLE CAY
also in dispensing. It is full
strong as the 'TINCTURA CAPS
The product of the third formul
sively for culinary purposes.
fruit of *Capsicum annuum* (cap
C. baccatum (bird pepper), and
(Guinea pods, red pepper), are in
used for this preparation, but
those preferred for medicinal
others have similar properties,
pungent and acrimonious; hence
given to them in the preparati
pepper. See PEPPER.

Essence of Ce'drat. See OIL (

Essence of Cel'ery. *Syn.* ESSE
SEED; ESSENTIA APII, ESS. A.
Prep. 1. From celery seed (bruis
4½ oz.; proof spirit, 1 pint; dige
and strain.

2. (Concentrated.) Celery se
tified spirit, 1 pint; digest as
fine. Both are used for flavouri

Essence, Cephal'ic. See HE
SENCE.

Essence of Cham'omile. *Syn.*
DROPS; ESSENTIA ANTHEMIDIS,
MELI, E. C. ALBA, L. *Prep.* 1. F
oil of chamomile, as essence of
machic and stimulant.—*Dose.* 5
½ fl. oz., shaken with about 1 pint
forms an excellent extemporaneo
water.

2. Gentian root (sliced or

el, ½ lb.; proof spirit, 1 gal.;
amomile, 3½ fl. oz.; macerate
y coloured. Some persons use
wood, instead of the gentian
l. Both the above are sto-
c, and are favourite remedies
ite, dyspepsia, &c.—*Dose.* As
r, or in a wine-glassful of wine

irct'ta. See INFUSION (Con-

'namon. *Syn.* ESSENTIA CIN-
US C. CONCENTRATUS, L. *Prep.*
innamon, as ESSENCE OF ALL-
DS.
. 5 oz.; rectified spirit, ¾ pint;
ligest a week, and strain. In-
st. Essence of cassia is com-
it. .
v'et. *Syn.* ESSENTIA ZIBETHI,
ivet (cut small), 1 oz.; rectified
s ESSENCE OF MUSK.
f rectified spirit use spirit of
th are used in perfumery;
ination with other substances.
loves. *Syn.* ESSENTIA CARYO-
rep. 1. (White.) From oil of
NCE OF ALLSPICE. *Used* as a

d.) Cloves (bruised), 3½ oz.;
pint; water, ½ pint; digest a
n. Inferior to the last. It is
g as INFUSION OF CLOVES (Ph.
sed in dispensing.
f'fee. See COFFEE.
Co'gnac. (kōne'-yăk). *Syn.*
NCE. *Prep.* From brandy oil,
fied spirit, 18 fl. oz. For fla-
spirit to imitate brandy. See

Cologne. *Syn.* CONCENTRATED
GNE; ESSENTIA COLONIENSIS,
NCENTRATA, L. *Prep.* 1. By
the quantity of the ingredients
OLOGNE WATER, and using the
ified spirit.
mon and cedrat, of each, 2 drs.;
y, 1 dr.; oil of bergamotte, 1 oz.;
l, 2 fl. oz.; purest rectified spirit,
d as a condensed perfume.
Colts'foot. *Prep.* 1. (Ryan,)
n, 1 oz.; rectified spirit and com-
re of benzoin, of each, 3 oz.; dis-
a few days decant the clear

Equal parts of balsam of tolu
d tincture of benzoin, with double
of rectified spirit.
of tolu, 5 fl. oz.; compound
zoin, 3 fl. oz.; powdered sugar
l oz.; hay saffron, 1 dr.; digest a
equent agitation.
toral and stimulant. A quack
consumption and most other
he lungs, but *unless assisted by*
and in the absence of

fever, it is more likely to kill than cure in these complaints. The last is the best formula.

Essence of Cu'bebs. *Syn.* CONCENTRATED ESSENCE OF CUBEBS; ESSENTIA CUBEBÆ, E. C. CONCENTRATA, L. *Prep.* 1. Cubebs (bruised, or preferably ground in a pepper mill), ½ lb.; rectified spirit, 1 pint; digest 14 days, press, and filter.

2. (Wholesale.) Cubebs, 4½ lbs.; rectified spirit, 1 gal. This essence has a very large sale, and if carefully prepared from a good sample of the drug, is a most excellent preparation. Every fl. oz. represents 2½ drs. of cubebs.—*Dose.* 1 to 3 drs.

Essence of Cubebs (Oleo-resinous). *Prep.* (Dublanc.) Oleo-resinous extract of cubebs, 1 oz.; rectified spirit, 3 oz.; dissolve. A very active and concentrated form of administering cubebs, which must not be confounded with the preceding preparation, which is the one always meant when 'Essence of Cubebs' is ordered.—*Dose.* ½ dr. to 1 dr.

Essence of Dill. *Syn.* DILL DROPS; ESSENTIA ANETHI, L. *Prep.* 1. From oil of dill, as ESSENCE OF ALLSPICE.

2. Oil of dill, extract of dill, and salt of tartar, of each, ½ oz.; rectified spirit, 1 pint; digest, and strain. Both the above are aromatic and anti-flatulent. The first is commonly used as an adjunct to other medicines, especially to purgatives for children. The second is a popular tonic and stomachic in the flatulent colic, dyspepsia, &c., of women and children.—*Dose.* A few drops, on sugar.

Essence of Er'got. See LIQUOR OF ERGOT OF RYE.

Essence of Ergot (Ethereal). *Syn.* ESSENTIA ERGOTÆ ETHEREA, E. SECALIS CORNUTI E., L. *Prep.* 1. (Mr. Lever.). Ergot (powdered), 2 oz.; rectified sulphuric ether, 2 fl. oz.; digest a week, express the tincture, filter, and abandon the liquid to spontaneous evaporation; lastly, dissolve the residuum in ether, 1 fl. oz. This is an expensive and troublesome formula. The following modification of it is both simpler and less expensive.

2. Ergot (ground), 8 oz.; ether, 16 fl. oz.; prepare a tincture as before, and by a gentle heat distil off the ether in a retort connected with a well-cooled refrigerator, until 15 fl. oz. shall have passed over; continue the evaporation at a reduced heat until the remainder of the ether has passed off; lastly, dissolve the residuum, as soon as cold, in ether, 4 fl. oz.

Obs. Each fl. oz. represents 2 oz. of ergot.—*Dose.* 10 to 30 drops as a parturifacient, taken on sugar; 3 to 5 drops as a hæmostatic and emmenagogue, in hæmorrhages, floodings, &c. It possesses all the acrid, narcotic principle of the ergot, but less of the hæmostatic principle than the ordinary essence, whilst it is much more costly.

Essence of Fen'nel. *Syn.* ESSENCE OF SWEET FENNEL; *ESSENTIA FŒNICULI*, L. *Prep.* From oil of fennel (*Fœniculum dulce*), as ESSENCE OF ALLSPICE.

Essence of Gen'tian. See INFUSION OF GENTIAN (Concentrated).

Essence of Gin'ger. *Syn.* CONCENTRATED TINCTURE OF GINGER, ESSENTIA ZINGIBERIS, TINCTURA Z. CONCENTRATA, L. *Prep.* 1. Unbleached Jamaica ginger (bruised), 5 oz.; rectified spirit, 1 pint; digest a fortnight, press, and filter.

2. (Oxley's 'CONCENTRATED ESSENCE OF JAMAICA GINGER.') The same as the preceding. with the addition of a very small quantity of essence of cayenne. The above possess only about 4 times the strength of tincture of ginger (Ph. L.); and though vended in the shops as essence of ginger, scarcely deserve the name.

3. As No. 1 (next article, *below*), but using double the quantity of spirit. Very fine.

4. (Kitchener's.) Ginger (grated), 3 oz.; yellow peel of lemon (fresh), 2 oz.; brandy, 1½ pint; digest 10 days. For culinary purposes, &c. See *below*.

Essence of Ginger (Concentrated). *Syn.* ESSENTIA ZINGIBERIS CONCENTRATA. *Prep.* 1. Jamaica ginger (best unbleached, in coarse powder) and siliceous sand, equal parts, are sprinkled with rectified spirit of wine, q. s. to perfectly moisten them, and after 24 hours the mass is placed in a 'percolator,' and after returning the first runnings 2 or 3 times, the receiver is changed, and more rectified spirit poured on gradually, and at intervals, as required, until as much essence is obtained as there has been ginger employed.

Obs. The quality of the product of the above formula is excellent, but the process is somewhat difficult to manage. The mass remaining in the percolator is treated with fresh spirit until exhausted, and the tincture so obtained is employed, instead of spirit, for making more essence with fresh ginger. The last portion of spirit in the waste mass may be obtained by adding a little water. Coarsely powdered charcoal is frequently used instead of sand, in which case the product has less colour; at the same time, however, a little of the flavour is lost.

2. (Wholesale.)—*a.* Best unbleached Jamaica ginger (as last), 12 lbs.; rectified spirit, 2½ galls., are digested together for 14 days, and the expressed and strained tincture reduced by distillation, in a steam or water bath, to exactly 1 gal.; it is next cooled, and transferred as quickly as possible into stoppered bottles, and the next day filtered.

Obs. The product of the last formula is a most beautiful article, of immense strength, and the richest flavour. The assertion made by a recent writer on pharmacy, that 'the product is very strong, but has lost some of the flavour of the ginger,' is evidently made in ignorance of the preparation. "We were the first to introduce and publish this formula, and have employed it for years on the most
extensive scale, and can conscie
that, for inexpensiveness, and t
the essence produced by it, it is
any other. The process, thou
complicated is, in reality, eas
The spirit distilled over contai
fragrant or aromatic principles
on the contrary, the little fla
ceived (apparently from a speci
oil) is rather disagreeable than
is better got rid of than ret
essence. The spirit is used w
for preparing the common tinc
and several other articles. The
when this process is adopted
awkward manipulation. When
draulic pressure should be empl
the tincture. 2 oz. of this essen
as equivalent to 3 oz. of the fine
fully twenty times as strong as t
OF GINGER' (Ph. L.). A sing
lowed, will almost produce
Cooley.

b. From ginger (as last), 24
spirit, 6 galls.; make a tinct
and reduce it by distillation t
cool as quickly as possible out
the air and add, of the strongest
of wine, 1 gal.; lastly, filte
Quality resembles No. 2, *a* (nea
in the habit of applying the me
in the last two formulæ to the
the essences of several other
active principles of which are
low temperature." Cooley.

Essence of Grape. *Prep.*
as ESSENCE OF ALMONDS. It is
brandy and wines. See OIL (V

Essence of Guaiac'um. *Syn.*
OF GUAIACUM; ESSENTIA GUA
TUM GUAIACI FLUIDUM. L.
guaiacum shavings, from whic
been sifted, 3 cwt., are exhauste
water, as in the preparation
using as little of that fluid as i
cessary; the decoction is evapo
1¾ gal.; it is next stirred until
the deposit of resinous matter,
into a bottle, and spirit of w
added; the whole is then repe
for a week, after which it is a
for 7 or 8 days, and the clea
canted into another bottle.

Obs. This preparation is fre
tuted for guaiacum shavings
tion of compound decoction
1 pint of this essence is consid
to 19 lbs. of guaiacum in subst
COCTION OF SARSAPARILLA (Co

Essence for the Handkerchi
TIA ODORATA, &c.

Essence for the Headache.
ESSENCE, EMBROCATION OF
HAWKINS' EMBROCATION, WA
ESSENCE FOR THE HEADACHE
AMMONIÆ, LINIMENTUM A

Prep. 1. Oil of lavender r.; camphor, 1 oz.; liquor of ; rectified spirit, 1 pint; dis- grant and powerful.

Spirit of camphor, 2 lbs.; f ammonia, 4 oz.; essence of

) Camphor and liquor of am- 2 oz.; oil of lavender, 4 drs.; 14 oz. Very fragrant. Stimu- acient. *Used* as a counter- a local pains, as headache, ear- Compound camphor liniment or it. See LINIMENT.

lenbane. *Syn.* ESSENTIA HY- lee ESSENCE (Anodyne), No. 2.

lop. *Syn.* ESSENTIA LUPULI, ICTURA LUPULI CONCENTRATA, New hops (rubbed small), 26½ it, 1 quart; digest 24 hours, (quickly) 1 pint, and set the *tus lupuli*) aside in a corked residuum add water, 1 pint; , cool, express the liquor, strain, t as quickly as possible to dry- t of a water bath, powder the add it to the distilled spirit; and filter.

: grains (yellow powder or lu- obiles), 5 oz.; rectified spirit, 1 10 days; express, and filter. ve are powerfully bitter, and e aroma of the hop. They are s strong as the 'TINCTURA LU- h. L. A few drops added to a or beer render it agreeably bit- chic.

r's E. OF HOPS.) Several noxious under the name of extract of hops e brewer's druggist. They are aid extracts of quassia, gentian, erful bitters. Of three of these h we have examined, one (for nsisted of the mixed extracts of hamomile; another was a prepa- ic acid; whilst a third ('strongly l for PORTER') consisted of about f the extracts of bitter aloes, coc- , and wormwood. A few years ese vile compounds was publicly ed 'warranted' as being equal to weight in hops (1 oz. to 5¼ lbs.).

f Jargonelle' Pear. *Syn.* PEAR RIT DE JARGONELLE, &c. *Prep.* il (acetate of oxide of amyl), as ALMONDS. This is now largely flavour confectionery and liqueurs, ad OIL (Volatile).

f Jas'mine. See SPIRIT and OIL

f Jes'samine. See SPIRIT and OIL.

f Jon'quil. See SPIRIT and OIL.

f Lav'ender. *Syn.* ESSENTIA LA- ODORATA), L. *Prep.* 1. Oil of [illegible]), 2 oz.; *rectified spirit* 1 *pint.*

2. As the strongest *Eau de lavende.* See SPIRIT.

Essence of Lavender (Red). See SPIRIT and TINCTURE.

Essence of Lem'on. *Syn.* ESSENTIA LIMONIS, L. *Prep.* 1. See OIL (Volatile).

2. (W. Procter.) Fresh oil of lemons, 1 fl. oz.; deodorised alcohol (strongest flavourless rectified), 8 fl. oz.; exterior yellow rind of lemons (fresh, ½ oz.; digest 48 hours, and filter. *Used* for flavouring mixtures, pastry, &c.

3. From oil of lemons, as ESSENCE OF ALL-SPICE. *Used* as the last.

Essence of Lemon Peel. *Syn.* ESSENCE OF LEMON RIND, QUINTESSENCE OF L. P.; ESSENTIA CORTICIS LIMONIS, L. *Prep.* 1. Yellow peel of fresh lemons, ½ lb.; spirit of wine, 1 pint; digest for a week, press, and filter. Very fragrant.

2. Yellow peel of fresh lemons, 1 lb.; boiling water, ½ gal.; infuse 1 hour, express the liquor, boil down to ½ pint, cool, and add oil of lemon ½ oz., dissolved in spirit of wine, 1½ pint; mix, and filter. *Used* as the preceding.

Essence of Lov'age. *Syn.* ESSENTIA LE-VISTICI, L. *Prep.* (Ph. Wurt.) Lovage root (levisticum officinale), 2 oz.; lovage seeds, 1 oz.; rectified spirit, 10 oz.; digest a week, and filter. Aromatic, stomachic, and diaphoretic. —*Dose.* ½ dr. to 1 dr.; in dyspepsia, dropsies, &c.

Essence, Madden's. Concentrated infusion of roses.

Essence of Malt. See COLOURING.

Essence of Mint. *Syn.* ESSENCE OF SPEAR-MINT; ESSENTIA MENTHÆ, E. M. SPICATÆ, E. M. VIRIDIS, L. *Prep.* As ESSENCE OF PEPPERMINT.

Essence of Musk. *Syn.* ESSENTIA MOSCHI, TINCTURA M. CONCENTRATA, L. *Prep.* 1. Grain musk, 2 oz., and boiling water, 1 pint, are digested together in a close vessel until cold, when rectified spirit of wine, 7 pints, is added; the vessel (preferably a tin bottle) being corked close, and tied over with bladder, the whole is digested, with frequent agitation, for 2 months, in the sunshine (in summer), or in an equally warm situation in winter. At the end of the time the essence is decanted and filtered.

2. Grain musk, ¼ oz.; rectified spirit of wine, 2 pints; essence of ambergris, 1 fl. oz.; digest as before.

3. Musk (from the bladder, rubbed very small), 5 oz.; civet, 1 oz.; essence of ambergris, 1 pint; spirit of ambrette, 1 gal.; as before.

Obs. All the preceding formulæ yield superior essences, but the product of the last is of the very finest quality, and such as is seldom sold, except by the most celebrated houses, when it fetches a very high price. It is *powerfully and deliciously odorous,* and has *received the approval* of royalty itself, both in these kingdoms and on the continent. The second formula also produces a very fine article, but less choice than that just referred to. The digestion should be long continued, and on no account less than 3 weeks, as otherwise much fragrant matter is left undissolved. The addition of 1 fl. dr. of either liquor of ammonia or liquor of potassa (the first is best) to each pint of the essence, vastly increases its fragrance. The essence of musk of the wholesale London druggists is generally made by merely digesting the freshly emptied musk pods in rectified spirit. Sometimes a little (a very little) grain musk is added. See ESSENCE ROYALE and ESSENCE OF AMBERGRIS.

4. (Guibourt.) Musk, 1 part; proof spirit, 12 parts; digest a fortnight, or longer. *Used* in dispensing, &c.

Essence of Musk Seed. See ESSENCE D'AMBRETTE.

Essence of Mus'tard. *Syn.* ESSENTIA SINAPIS, L. *Prep.* (Whitehead's.) Black mustard seed (bruised), and camphor, of each, 2 oz.; oil of rosemary, 3 drs.; balsam of tolu, 1 dr.; annatto, ¼ dr.; digest a week, and filter.

Essence of Myr'tle. *Syn.* ESSENCE OF MYRTLE BLOSSOMS; ESSENCE DE MYRTE, ESPRIT DE M., Fr. *Prep.* Myrtle tops (in blossom), 2½ lbs.; proof spirit, 9 pints; digest 3 days, then distil 1 gal. A pleasant perfume. See OIL (Volatile).

Essence of Nero'li. *Syn.* ESSENCE DE FLEURS D'ORANGES, ESPRIT DE F. D'O., Fr. *Prep.* 1. Neroli, 3 drs.; rectified spirit of wine, 1 pint; mix. A delicious perfume.

2. Oil of orange, 2 drs.; orris root (bruised), ¼ oz.; ambergris, 10 grs.; neroli, 35 drops; spirits of wine, 1 pint; digest 14 days, and filter. Very fragrant, but less 'chaste' than the last.

Essence of Nut'meg. *Syn.* ESSENTIA MYRISTICÆ, E. M. MOSCHATÆ, E. NUCIS M., L. *Prep.* From essential oil of nutmeg, as ESSENCE OF ALLSPICE. *Used* as a flavouring or zest by cooks, liqueuristes, and confectioners.

Essence, Odontal'gic. See TOOTHACHE ESSENCE.

Essence d'Œillets. [Fr.] *Prep.* From cinnamon, 3 oz.; cloves, 1¼ oz.; (both well bruised;) rectified spirit, 1 quart; digest for a week. Oil of cloves and spirit of cloves also bear this name in some places.

Essence of O'pium. See ANODYNE ESSENCE, No. 1. BLACK DROP and ROUSSEAU'S LAUDANUM have also been sometimes so called.

Essence of O'range. *Syn.* ESSENTIA AURANTII, L. *Prep.* AS ESSENCE OF LEMON.

Essence of Orange Peel. *Syn.* ESSENTIA CORTICIS AURANTII, L. *Prep.* 1. (Golden.) Fresh yellow rind of orange, 4 oz.; rectified spirit and water, of each, ½ pint; digest for a week, press, filter, and add of sherry wine, 1 quart. A pleasant liqueur.

2. (Saccharated.) See OLEO-SACCHARUM.

Essence d'Orient. [Fr.] A pearly looking substance, found at the base of the scales of the blay or bleak, a small fish of
cyprinus.

Prep. The scales are scraped
into a tub containing water, and
tion and repose the fluid is poured
place supplied with fresh water,
turn, after agitation and repose, is
off. This part of the operation
till the 'essence' and scales are
from impurities, when the whole
a sieve, which retains the latter,
the former to flow through. Aft
a short time, the essence is obtai
posit at the bottom of the vessel.

Obs. Essence d'Orient has a
and pearly aspect, and is employ
the interior of glass bubbles
imitation of pearls and mother-o
tendency to putrefaction, while
state, may be obviated by the
little liquor of ammonia.

Essence of Patch'ouli. *Syn.*
PATCHOULIE, ESPRIT DE POUCH
Prep. 1. Indian patchouli (leaves
tops), 2½ lbs.; rectified spirit, 9
for a week; add, of water, 1 gal.; oil
(Mitcham), 3 drs.; common salt, 2
well together, distil over (rapidly
and add of essence of musk, 3½ fl. d
fashionable perfume. Essence o
thus prepared, has been largely u
court and by the nobility generally

2. Patchouli, 3 oz.; rectified sp
digest a week, press, and filter.
moner kind is made with proof spi

Essence of Pear. *Syn.* ESSEN
GONELLE.

Essence of Pen'nyroyal. See E
LEGII, E. MENTHÆ P., L. *Prep.* F
royal (*Mentha pulegium*), as ESSEN
PERMINT. Stimulant, carminativ
menagogue. *Used* in dispensing,
make extemporaneous pennyroyal

Essence of Pep'permint. *Syn.*
MENTHÆ PIPERITÆ (B. P.) L. *Prep*
Oil of peppermint, 1 part; rectifi
parts. Mix.—*Dose.* 10 to 20 mini

2. To the last add of herb peppe
ley leaves, or spinach leaves (prefer
the first two), ½ oz., and digest for
until sufficiently coloured. Sap g
12 grs., rubbed up with a teaspoo
water) is also used for the same p
delicate light green.

3. (Ph. U. S.) Oil of peppermin
rectified spirit, 16 fl. oz.

Obs. Essence of peppermint i
ceived to be good by the ignoran
has a pale-greenish tint, which the
proof of its being genuine. The
less way of tinging it is that indic
A little green mint or parsley will,
found to improve the flavour. Thes
are quite harmless. The practice
cupreous salts, adopted by some
principled makers, is unpardonable,

ame one, as not the least
convenience, cost, or ap-
n such a practice, while
', though small in quan-
sufficient to impart a
the liquid. This fraud
the addition of liquor of
which will strike a bluish
our when copper is pre-

nint (like that of most of
oils) is cordial, stimulant,
few drops (10 to 30) on
a little water or wine, is
n flatulence, colic, nausea,
also extensively used as a
it by cooks, confectioners,
few drops, well agitated
old water, form an excel-
peppermint water.
nd 2, generally the latter,
by the respectable portion
le. The various published
similar essences, ordering
a larger proportion than
, are never adopted in prac-
acts (often impossible com-
in the imaginations of the

'to. See ESSENCE OF ALL-

apple. From pine-apple oil
yrate of ethyl), as ESSENCE
forms a delicious flavouring
'ectionery, rum, &c. See
'olatile).
'sia. *Syn.* ESSENTIA QUAS-
. From quassia (sliced), 1½
l pint; digest 10 days, and
lded to 7½ fl. drs. of water,
of quassia of the Ph. L.—
ter or wine, an hour before
chic tonic, in dyspepsia, loss
rticularly when complicated
lrs., three or four times daily,
antiseptic, in intermittents,

—*a.* From powdered quassia
a little rum) and "foots"
ar or sugar bottoms), equal
the consistence of a semi-
he addition of a few spoon-
r ale.
ered quassia, 1 part; burnt
parts; well stirred together.
out. Both are used by frau-
substitutes for hops.
'ine. *Syn* ESSENTIA QUINÆ,
disulphate of quinine, 1½ oz.;
pint; digest with warmth,
g in a little dilute sulphuric
), and employing constant
e whole is dissolved. 1 fl. dr.,
of proof spirit, forms the
(Ph. L.). Every fl. dr.
of disulphate of quinine, or

about 10 grs. of the neutral sulphate. If more sulphuric acid is added than is sufficient to dissolve the salt (*i. e.* convert it into a neutral sulphate), the solution is apt to deposit part of it on keeping, owing to the gradual formation of ether, by the action of the excess of acid on the alcohol.

Essence of Rat'afia. The same as Essence of Almonds. So called from being used to flavour ratifias, noyeau, and other liqueurs.

Essence of Rhu'barb. *Syn.* ESSENTIA RHEI, L. *Prep.* From rhubarb (in powder) and siliceous sand, of each, 5 oz.; proof spirit, 1 pint; by the method of displacement. Every fl. oz. represents the active virtues of 2 drs. of rhubarb.

Essence of Rondele'tia. *Prep.* 1. Essence (oil) of bergamotte, essence (oil) of lemon, and oil of cloves, of each, 1 dr.; otto of roses, 10 drops; rectified spirit, 1 pint.

2. To the last add, of oil of lavender, 1 dr.; neroli, 15 drops. A very fashionable and agreeable perfume.

Essence of Ro'ses. *Syn.* ESSENTIA ROSÆ (ODORATA), L. *Prep.* 1. Attar of roses (genuine), 2 drs.; alcohol, 1 pint; agitate frequently until they unite.

2. Attar of roses, 1 oz.; rectified spirit, 1 gal.; mix in a close vessel, and assist the solution by placing it in a bath of hot water. (See ESSENCE OF MUSK.) As soon as the spirit gets warm, take it from the water and shake it till quite cold; the next day filter. —*Obs.* Unless the spirit of wine is of more than the common strength, it will not retain the whole of the otto in solution in very cold weather.

3. To each pint of either of the preceding, add, of oil of bergamotte, 30 drops; neroli and essence of musk, of each, 20 drops.

4. Petals of roses, 3 lbs., digest in spirit of wine, 5 quarts, for 24 hours; distil to dryness in a water bath; digest the distilled spirit on 2 lbs. of fresh rose petals, as before, and repeat the whole process of maceration and distillation a third, fourth, fifth, and sixth time, or oftener, the last time only drawing over 1 gal., which is the essence. Each of the above is very superior. The last has a peculiar delicacy of flavour, when the spirit used to make it is pure.

Essence of Roses (Red). *Syn.* ESSENTIA ROSÆ (RUBRA), TINCTURA R. CONCENTRATA, L. *Prep.* From rose leaves, 1 lb.; proof spirit, 1 gal.; digest for 14 days, press, strain, add concentrated acetic acid, 2½ fl. drs.; mix well, and the next day filter. *Used* to make extemporaneous SYRUP and HONEY OF ROSES, &c. Smells, colours, and tastes, strongly of the flower. CONCENTRATED INFUSION OF ROSES is sold under the same name.

Essence of Rose'mary. *Syn.* ESSENTIA ROSEMARINI, L. *Prep.* From oil of rosemary, as ESSENCE OF ALLSPICE. *Used* as a perfume; *also to make extemporaneous rosemary water.*

Essence Royale. [Fr.] *Prep.* 1. (Soubeiran.) Ambergris, 40 grs.; musk, 20 grs.; civet and carbonate of potassa, of each 10 grs.; oil of cinnamon, 6 drops; oil of rhodium and otto of roses, of each, 4 drops; rectified spirit of wine, 4 fl. oz. (say ¼ pint); macerate for 10 days or longer. Antispasmodic and aphrodisiac. A few drops on sugar, or in syrup of capillaire.

2. See Essence of Ambergris.

Essence of Sarsaparil'la. *Syn.* Concentrated essence of sarsaparilla; Essentia sarsæ; E. sarsaparillæ, L. *Prep.* 1. Sarsaparilla root (best red Jamaica), 2¾ lbs., is carefully decorticated, the bark reduced to coarse powder, and digested for a week or 10 days in sherry, ¾ pint, and rectified spirit, ¼ pint, with frequent agitation; after which the essence is expressed, and in a week the clear portion is decanted from the sediment. A very elegant preparation. ⅛ fl. dr., added to 7 fl. drs. of water, forms 1 fl. oz. of a solution of equal strength to decoction of sarsaparilla of the Ph. L. Every fl. oz. represents the active principles of 2 oz. (= 2 oz. 85 grs., avoir.) of sarsaparilla root. In other words, it is twice as strong as the root, and 16 times as strong as the decoction.

2. Alcoholic extract of sarsaparilla, 7 oz.; sherry, ¾ pint; rectified spirit, ¼ pint; dissolve, and filter. Strength as the last.

3. (Beral.) Alcoholic extract, 4 oz.; sherry wine, 1 pint; dissolve and filter. About 3 fl. drs., added to water, 1 pint, form an extemporaneous decoction.

4. (Guibourt.) Alcoholic extract, 4 oz.; white wine, 1 lb. Strength the same as Nos. 1 and 2 (nearly).

5. (Hening.) Sarsaparilla (bruised, 10 oz.; distilled water, 6 pints; macerate at a temperature of 120° Fahr. for six hours, and strain; repeat with the same quantity of fresh water; mix the liquors, and evaporate in china vessels at 160° Fahr. If reduced to 10 fl. oz. (or to 9 fl. oz., with 1 fl. oz. of rectified spirit added), 1 fl. dr., mixed with 7 fl. drs. of water, will be equal to the decoction of the usual strength. If reduced to 5 fl. oz., 1 fl. dr. will be equal to 2 fl. oz. of the decoction.

6. The bark separated from sarsaparilla root, 2¾ lbs., is exhausted with water as last; the liquid is evaporated, as quickly as possible, in a water bath, to 16 fl. oz., and when cold, mixed with rectified spirit, 4 fl. oz. Strength same as No. 1.

7. The infusion in No. 6 is evaporated to 10¼ fl. oz., and when cold mixed with sherry, ¼ pint; in a week the clear portion is decanted from the sediment. Strength same as No. 1.

Obs. The formulæ No. 1, 2, 6, and 7, have each in turns been extensively employed by us in the laboratory, with the most satisfactory results. See Liquor of Sarsaparilla.

Essence of Sarsaparilla (Compound). *Syn.* Essentia sarsaparillæ composita, E. sarsæ c., L. *Prep.* 1. One pint of No. 1, 2, 6, or 7 (*above*), is triturated wi
prepared from mezereon bark,
tract of liquorice, 4 oz.; when
turned to the bottle, and essen
1¼ fl. dr., and oil of sassafras,
added; the whole is then well
least 15 minutes, and after a we
clear portion is decanted, as be
with 7½ fl. drs. of water, forms
compound decoction of sarsapar

2. (Cadet.) Sarsaparilla (bru
water, q. s.; exhaust the roo
macerations; unite the liquors,
to 10 fl. oz.; strain, and add,
alcohol (·842) and tinctures of
mezereon, of each, 4 fl. drs.; whi
oil of sassafras, 12 drops; extr
2 drs.; agitate, and after repos
fore. This is nearly 8 times as
sarsæ co.,'—Ph. L. The f
formula. See Liquor of
(Compound).

Essence of Sa"vory Spices.
pepper, 4 oz.; powdered turme
riander seeds, 1½ dr. (all ground
oil of pimento, 1¼ fl. dr.; oils of
cassia and caraway, of each,
spirit, 1 pint; digest, with agita
night. Very fine.

2. Black pepper, 3 oz.; allspi
megs and burnt sugar, of each
cassia, coriander, and caraway
1 dr. (all bruised or ground);
1 pint; digest, with agitation,
14 days, press, and filter. Use
ing. When made with proof s
and only ¼ the above weight
called 'tincture of savory sp

Essence of Sen'na. See Liq
sion (Concentrated).

Essence of Smoke. See Wh
sence.

Essence of Soap. *Syn.* Spi
Shaving fluid; Esprit de s
de savon, Essence royale
barbe, Fr.; Essentia sapo
saponis concentrata, L. *P*
soap (in shavings), 4 oz.; proof
dissolve, and add a little perfu

2. Venetian soap, ¾ lb.; salt
benzoin, ½ oz.; spirit of wine, 1

3. Best soft soap, ½ lb.; boiling
dissolve, cool, and add, oils of cin
verbena, and neroli, of each, 6 d
in rectified spirit, 1 pint; mix
perfectly transparent, add a littl
spirit, or filter through blotting

Obs. This alcoholic solution o
used for shaving, and is very
travelling, as a good lather ma
produced without the trouble o
soap-box. Instead of the abov
drops of essence of musk or a
drops of any of the perfumed spi
of attar of roses, or 6 drops of
matic essential oils, may be adde

s given to the preparation,
de la rose, &c.
ite soap, 3 oz.; carbonate of
of spirit, 12 oz.; dissolve.
They are all used as fric-

D,—Guibourt.) White soap,
1 part; spirit of rosemary,
. A variety of opodeldoc.
cation in rheumatic pains,

Herbs. *Syn.* Spirit of soup
cture of s. h., &c. *Prep.*
mon thyme, winter savory,
nd sweet bazil, of each 1 oz.;
d), and eschalots, of each,
ry seed, ¼ oz.; proof spirit or
igest for 10 days or a fort-
r flavouring essence for soups,
e Essence of Savoury

ear'mint. See Essence of

prats. *Syn.* Essence of
ts. From pickled sprats
es), as Essence of Ancho-
t is commonly sold.

uce. *Syn.* Fluid extract
entia abietis, Extractum
Prep. A decoction of the
the black spruce-fir (*Abies*
ed to the consistence of a
Used to make spruce beer,

ache. *Syn.* Essentia odon-
rep. 1. Acetate of morphia,
of pellitory of Spain (made
rit), 2 fl. oz.; acetic acid (gla-
issolve, and add of oil of cloves,

) Pellitory, ½ lb.; extract of
; rectified spirit, 1 pint; digest
and add, of hyponitrous ether,
ne, ½ oz.; oil of cloves, 2 drs.
ontalgic).

u'berose. *Prep.* The flowers
ith sheep's or cotton wool, im-
the purest oil of ben or of olives,
essel, closely covered, and kept
a water bath; the flowers are
and fresh ones substituted, and
until the oil (huile au tube-
iently scented. The wool or
mixed with the purest spirit of
illed in a water bath; or it is
in a warm situation, and in a
el, for several days, during the
h time frequent agitation is
o. A similar plan is followed
ation of essences of jasmine,
er like flowers. See Spirit.

Tur'tle. *Syn.* Essence of
e. *Prep.* From essence of
[illegible] wine, of each, 3 oz.; basil
[illegible] ketchup, ½ *pint; the*
[illegible] the yellow peel of 1 lemon; curry powder, ¼ oz.; digest for a week. *Used* to impart the flavour of turtle to soups and gravies.

Essence of Tyre. See Hair Dye.

Essence of Vanil'la. *Syn.* Essentia vanillæ, Tincture v. concentrata, L. *Prep.* 1. Vanilla (cut small), 2 oz.; rectified spirit, 1 pint; digest a fortnight.

2. (Wholesale.) Vanilla, 2 lbs.; rectified spirit, 1 gal.; proceed as for essence of musk. Very superior.

3. Vanilla (best), ¾ lb.; spirit of ambrette, 1 quart; cloves, 30 grs.; grain musk, 7 grs.; as last. Much esteemed. It is chiefly used as a perfume and for flavouring.

Essence of Verbe'na. *Syn.* Essence of lemon-grass, E. of citronelle; Essentia verbenæ, L. *Prep.* 1. From oil of lemon grass or verbenæ (*Andropogon citratum*), as essence of allspice.

2. To the last add, of essences of ambergris and bergamotte (oil), of each, 1 fl. dr.; neroli, ½ fl. dr.

3. To No. 1 add, of oils of lavender and bergamotte, of each, ½ dr.; essence of vanilla, 2 fl. drs. A powerful and refreshing perfume.

Essence of Vi'olet. *Syn.* Essentia violæ, L.; Essences des violettes, Fr. See Essence of Tuberose and Spirit.

Essence of Vittie Vayr. *Syn.* Essence of vetiver; Essence de vittie vayr double, Fr. *Prep.* 1. Vittie vayr or cuscus (the root of *Andropogon muricatus*, cut small and bruised), 3 lbs.; proof spirit, 9 pints; digest a week, add of water, 5 pints, and the next day distil over 1 gal. of essence.

2. To the last, before distillation, add, of otto of roses, ½ dr.; eau de melisse (spirit of balm), ½ pint; and proceed as before. *Used* as a perfume. In 1831 it was much employed in Paris as a prophylactic of cholera.

Essence, Volatile (Acetic). *Syn.* Pungent acetic essence; Essentia volatilis acetica, L. Aromatic vinegar.

Essence, Volatile (Ammoniacal). *Syn.* Pungent ammoniacal essence, Aromatic ammoniacal e.; Essentia volatilis, E. v. ammoniacalis, E. v. aromatica, &c., L. *Prep.* 1. Oil of cinnamon, 6 drops; otto of roses, 12 drops; oil of cloves, 1 fl. dr.; essence of bergamotte, 2 fl. drs.; oil of lavender (Mitcham), 4 fl. drs.; essence of musk, 5 fl. drs.; liquor of ammonia (strongest), 1 pint; mix in a cold place, and shake the bottle until the whole is combined.

2. Essence of violets and oil of cinnamon, of each, 12 drops; neroli, essence of jasmine, and otto of roses, of each ½ dr.; oil of lavender, 1 dr.; essence royale and essence (oil) of bergamotte, of each, 2½ drs.; liquor of ammonia (strongest), 1 pint; as the last.

3. Oils of lemon and bergamotte, of each, 5 fl. drs.; oil of lavender, 1½ fl. dr.; otto of roses, 1 fl. dr.; oils of cassia neroli, cloves, and cedrat, *of each, ½ fl. dr.; oil of* sandal wood, 15 drops; *liquor of ammonia* (strongest), 1 pint.

4. Essence of bergamotte, 6 fl. drs.; oil of lavender, 4 fl. drs.; oil of cloves, 3 fl. drs.; oil of cassia, 1½ fl. dr.; oil of verbena (lemon grass), 1 fl. dr.; otto of roses, 30 drops; liquor of ammonia, 18 fl. oz.

5. (Redwood.) Oil of bergamotte, 3 oz.; essence of lemons, 2 oz.; oil of lavender, 6 drs.; essence of jasmine, 4 drs.; oil of sassafras, 3 drs.; oil of neroli, 2 drs.; otto of roses, 1½ dr.; oil of origanum and essence of ambergris, of each, 1 dr.; musk, 20 grs.; macerate for a week, and decant the clear portion. It is added to the strongest liquor of ammonia in proportion of 1½ oz. to the pint.

Obs. The above are used to fill smelling-bottles. They are all very fragrant and refreshing.

Essence, Ward's. See HEADACHE ESSENCE.

Essence of Water-fen'nel. *Syn.* ESSENTIA PHELLANDRI AQUATICI, E. FŒNICULIS A., L. *Prep.* (Cottereau.) Water-fennel seeds (fine-leaved water-hemlock, bruised), 1 oz.; proof spirit, 4 fl. oz.; digest. Narcotic and pectoral. —*Dose.* 5 to 25 drops, combined with bark; in phthisis, &c.

Essence, Westphalian. ESSENCE OF SMOKE, E. OF WOOD-SMOKE, CAMBRIAN ESSENCE, SMOKING FLUID; ESSENTIA FULIGINIS, &c., L. *Prep.* 1. Crude or empyreumatic pyroligneous acid, 1 pint; sugar colouring, 2 oz.; dissolve, and in a week decant the clear portion.

2. Tar, 3 drs.; sugar colouring, 2 oz.; hot crude pyroligneous acid, 1 pint; agitate constantly for 1 hour, and after repose decant the clear portion.

3. Acetic acid (Ph. L.), 1 pint; creasote, 5 drs.; mix. White.

4. Barbadoes tar, ½ oz.; burnt sugar and common salt, of each, 1 oz.; strong pickling vinegar, ¾ pint; port or elder wine, ¼ pint; digest as before. Inferior to the preceding. *Used* to impart a smoky flavour to meat, fish, &c., by brushing it over them, or adding a little to the brine in which they are pickled.

Essence of Worm'wood. *Syn.* ESSENTIA AMARA, E. ABSINTHII, L. *Prep.* 1. Extract of wormwood, 4 oz.; oil of wormwood, 1 oz.; rectified spirit, 1 pint; digest a week, and filter. Tonic, stomachic, and vermifuge.—*Dose.* 10 drops to a teaspoonful.

2. (Van Mons.) Tincture of wormwood, 1 pint; salt of wormwood, 5 drs.; extract of wormwood, 1 dr.; digest as before.—*Dose.* ½ to 1½ fl. dr.

Fla"vouring Essences. *Syn.* CULINARY ESSENCES, SPICE E., ESSENCES FOR THE TABLE, &c. Those used by cooks, confectioners, liqueurists, &c., are all made by either dissolving 1 fl. oz. of the essential oil of the particular substance in 1 pint of rectified spirit, or by digesting 4 to 6 oz. of the bruised spice, or 5 to 10 oz. of the dried herb, in a like quantity (1 pint) of spirit. The first method is preferable, from being the least troublesome, and yielding *the finest* product. They are commonly labelled 'CONCENTRATED ESSENCE O
inferior article, vended under t
'ESSENCES OF CULINARY HERBS,'
TINCTURES,' 'TINCTURES FOR K
&c., are prepared from half the a
of oil or spice, infused in a pint o
or British brandy. The princip
of this class are the essences of
way, cardamoms, cassia, cayenne
cinnamon, cloves, coriander seed,
ginger, lemon peel, mace, marjor
orange peel, peppermint, spea
basil, and the like. The whole
employed to flavour soups, gr
meats, pastry, wines, mulled wi
&c.

Essences, Flower. Those for w
formulæ are not given in this wo
of them be made from the essen
flowers and rectified spirit, as th
digesting the flowers (crushed or
5 lbs., in proof spirit, 2 galls., fo
and then drawing over, by disti
For the essences of those flowers
strongly odorous, the spirit th
distilled from a like quantity
second, and a third time, or even
essences of other organic substan
grant principles are volatile, m
in the same manner. A small q
other odorous essence is freque
the product, to enrich or modify
See FLOWERS and ESSENCES BY

Essences, Fra'grant. See FLO
(*above*), ESSENTIA ODORATA, PE

Essences, Fruit. See ESSENC
PINE-APPLE, JARGONELLE, &c.

Essences by Infu'sion. This
perfumers, is commonly applie
sences, eaux, and esprits, which
by digesting the ingredients in
as the vehicle for the aroma, in
those obtained by 'distillation,'
or 'pressure.' Thus, the ESSEN
GRIS, MUSK, and VANILLA, are o

Essences, Vi'nous. *Syn.* Ess
L. These are prepared in a simi
wines (VINA) of the pharmacop
times the usual quantity of in
the very strongest sherry wine.
to 7 fl. drs. of wine or water (pr
only), forms an extemporaneou
the officinal VINA MEDICATA.
above are largely used in disp
travellers. See LIQUOR and W

Essentia Bi'na. See COLOUR

Essentia Odora'ta. *Prep.* 1.
1 dr.; oils of cloves, cassia, and
each, ½ dr.; neroli, 20 drops; e
fl. drs.; rectified spirit, ½ pint;

2. (Redwood.) English oil o
drops; oil of cloves, 32 drops;
peel, 16 drops; oil of bergamo
spirit of nitre, of each, 8 drops;
sandal-wood, neroli, and otto of
2 drops; oil of cinnamon, 1

ssnco of ambergris and musk, of
boney water, 8 oz.; mix. *Used*
for the handkerchief, &c. The
ns unnecessarily complicated and

lorifera. *Prep.* 1. Grain musk
f Peru, of each, 10 grs.; civet, 4
loves, 5 drops; oil of rhodium, 3
f tartar (dried by a dull-red heat
dr.; rectified spirit (strongest),
cerate for 14 days, and pour off

hodium and balsam of Peru, of
il of cloves, 1 dr.; spirit of am-
rs.; essence of civet and vanilla,
oz.; essence of musk, 5 fl. oz.;
lavender, verbena, and cassia, of
As last. Both are very plea-
and powerful perfumes for per-

L OIL. See OIL (Volatile).

L SALT OF BARK. See BARK

L SALT OF LEMONS. *Syn.*
ONS; SAL LIMONUM, L. The pre-
l under this name is made by
of tartar (bitartrate of potassa)
weight of salt of sorrel (quad-
otassa), both in fine powder. It
nove fruit stains, &c., from linen,
little of it on the part moistened
ater. It is poisonous, if swallowed

A species of engraving, in
sign is formed on the plate by the
acid, or some other fluid, instead
out by the graver.

he ORDINARY PROCESS OF ETCHING
covered with 'etching ground' (an
g varnish), and the design is
the metal through the ground,
a pointed tool of steel called the
edle' or 'point.' A border of wax
ed round the plate, and the 'biting'
on, and allowed to remain till the
finest portions of the design are
'bitten in.' The etching fluid is
d off, the plate washed, and the
'stopped out' with Brunswick black
rnish; the solvent is again poured
wed to remain until the finest por-
exposed lines are sufficiently deep,
acid is again poured off, and the
ess is repeated till the very darkest
adows are sufficiently 'bitten in.'
is then cleaned, and is ready to be
m. Occasionally the etched design
few finishing touches with the

re several varieties of etching, of
following are the principal:—
WITH A SOFT GROUND, when a coat-
l or tallow is employed, and the de-
n on a piece of paper, laid evenly
und, *by which means the fatty*
to the paper, on the parts pressed on by the point or pencil, and the copper beneath becomes exposed, and is then acted on by the acid. The effect resembles that of chalk or pencil drawings.—STIPPLING, or executing the design in dots instead of lines.—AQUATINTA or AQUATINT, a mode of etching on copper for producing an effect resembling a drawing in Indian ink. It is performed by sifting powdered asphaltum or lac resin on the plate, previously slightly greased, and, after shaking off the loose powder, gently heating it over a chaffing dish; on cooling, the lights are covered with turpentine varnish coloured with lampblack, by means of a hair pencil, and a rim of wax being placed round the plate, a mixture of 'aquafortis' and water is poured on it, and allowed to remain for 5 or 6 minutes, when it is poured off, the plate dried, and recourse had to the pencil as before. The process of 'stopping' and 'etching' is repeated again and again, until the darkest shades are produced. Sometimes, instead of using asphaltum, an alcoholic solution of shell-lac or gum mastic is poured over the plate, placed in a slanting direction; this varnish forms a film, which, on drying, leaves innumerable cracks or minute fissures through which the acid acts on the plate. The fineness or coarseness of the grain depends entirely upon the condition of the powdered asphaltum, or on the quantity of matter dissolved in the spirit employed to form the ground.

The fluids employed for 'biting in' the designs vary considerably, almost every artist having his own receipt. Aquafortis, more or less diluted, is, however, generally employed for COPPER, and this, with the addition of pyroligneous acid, for etching on STEEL; but any fluid that rapidly dissolves the metal may be used for the purpose. The 'etching ground' may be formed of any substance capable of resisting the action of the etching fluid, and which is, at the same time, sufficiently soft to allow of the free use of the needle or point, and sufficiently solid to prevent an injury to the design during the 'scratching in.'

In ETCHING ON GLASS, the ground is laid on, and the design 'scratched in' in the usual way, when liquid hydrofluoric acid is applied, or the glass is exposed to the action of hydrofluoric acid gas. The former renders the surface of the etching transparent, the latter opaque. A simple modification of the process is to wet the design with sulphuric acid, and then to sprinkle on some finely pulverised fluor spar (fluoride of calcium), by which means hydrofluoric acid is set free and attacks the glass. This method may be very easily applied to the graduation of glass vessels, thermometer tubes, &c.

A RAPID METHOD OF ETCHING ON IRON OR STEEL, capable of very general application, is as follows:—"*The metal is warmed until it is capable of melting* a piece of bees' wax, or *'etching ground,'* which is then carefull rubbed over it, so as to form a thin and even coating; when cold, the design is 'scratched in' in the common way; a little powdered iodine is then sprinkled on the exposed parts, and at the same time a few drops of water are added, and the two worked into a liquid paste with a camel-hair pencil. The paste is then moved about over the intended etching, for a period varying from one to five minutes, according to the depth of the lines required to be produced. Afterwards the whole is removed, and reapplied, &c., as with the usual etching fluids. The same etching-paste, by being kept for a few days, again acquires the property of dissolving iron, and may be used again and again; but independently of this, the iodide of iron formed during the process, if rapidly evaporated to dryness in a clean iron vessel by a moderate heat, and placed in stoppered bottles, will sell for more than the original cost of the iodine. To travellers and amateurs who amuse themselves with the delightful art of etching, iodine, from its portability and convenience, will, doubtless, prove invaluable. We have adopted it with considerable success, and have found it especially useful in marking surgical instruments, razors, and other edge tools. We published this method many years ago. Several parties have since availed themselves of our suggestions and formulæ, but without the slightest acknowledgment of the source from which they obtained them." (A. J. Cooley.)

Etching, Electro-. This mode of etching, which is in many respects superior to the ordinary mode, is based upon the destructive action of certain 'anions' during 'electrolysis.'[1] If two plates of copper be connected with the opposite ends of a voltaic battery, and placed in a vessel containing very dilute sulphuric acid, the plate connected with the copper of the battery will be attacked by the anion oxygen which is released during the decomposition of the acid. This destructive action can be localised at pleasure by covering certain parts of the plate with a protecting stratum of varnish, ordinary 'etching ground' for instance. In the practice of electro-etching, the drawing is 'scratched in' in the usual way through an ordinary ground; a stout wire is then soldered to the plate, and this, as well as the back of the plate, is coated with sealing-wax varnish. Thus prepared, the plate is placed in a suitable 'decomposition cell' opposite a plate of somewhat similar size, and the two are connected respectively with the copper and zinc of a 'Daniell's cell,' or the silver and zinc of a 'Smee's cell.'[2] After about ten minutes the plate is removed, washed, and dried; and when the 'fine work' has been stopped out with Brunswick black, it is returned for another space of ten minutes. By alternately exposing the plate to the action of the decomposing fluid, and 'stopping out' parts of the the required gradation in tints is The exact duration of the various exp well as their number, must, of course, lated by circumstances. See Etching (*below*).

Etching Fluids. 1. (For COPPER.)— 'aquafortis,' 2½ fl. oz.; water, 5 fl. oz.;

b. To the last add of verdigris, 1 oz.; 2½ fl. oz.; dissolve. For light touches.

c. (EAU FORTE,—Callot and Piranesi.) sal-ammoniac, sea salt, and verdigris, 4 oz.; vinegar (pyroligneous acid), 8 water, 16 fl. oz.; mix, dissolve, boil for minutes in a glazed or stoneware ve and decant the clear portion. *Used* last.

d. Water acidulated with sulphuric *Used* in the process of electro-etching.

2. (For STEEL.)—*a.* From iodine, 1 filings or wire, ½ dr.; water, 4 fl. oz. be kept in a stoppered bottle, until for use.

b. From iodine, 3 drs.; iodide of pot 1 dr.; proof spirit, 1 fl. oz.; water, 2 fl. the last.

c. (Mr. Turrel.) Pyroligneous acid, 4 alcohol (rectified spirit), 1 fl. oz.; mix, of nitric acid or double aquafortis (sp. gr. 1 fl. oz.

d. From hydrochloric acid, 5 parts; 95 parts; mix, and add the liquid to lution of chlorate of potassa, 1 part, in 50 parts.

e. A solution of common salt. *Used* process of electro-etching.

Etching Ground. *Syn.* ETCHING VA *Prep.* 1. Bees' wax, 5 parts; linseed part; melted together.

2. (Callot's HARD VARNISH, FLOR V., FLORENCE V.) From linseed oil and tic, equal parts, melted together.

3. (Callot's SOFT VARNISH.) From oil, 4 oz.; gum benzoin and white wax, of ½ oz.; boil to two thirds.

4. (Lawrence.) White wax, 2 oz.; pitch and Burgundy pitch, of each, melt, add by degrees, of powdered asph 2 oz.; and boil together, until a piece, thoroughly cold, will break by being double 2 or 3 times between the fingers; pour it into warm water, make it into balls, and place each of them in a piece taffety for use.

Obs. The preceding compositions are plied to the surface of the plates, previ made sufficiently warm to melt them their even diffusion being promoted by bing them with a wad of cotton. Those are white are then generally blackened on surface by skilfully passing them over smoky flame of one or more candles, by the marks of the etching point on the metal are rendered the more visible.

ETHER. *Syn.* OXIDE OF ETHYL. scribed under ETHYL, OXIDE OF. See

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[1] See ELECTROLYSIS and ELECTROTYPE, pages 428 and 429.

[2] See VOLTAIC ELECTRICITY.

e known under the name of ethers
rue ethers, or salts of ethyl, and
low.

anthar'ides. *Syn.* ÆTHER CAN-
L. *Prep.* (Œttinger.) From
nthärides, 1 part; ether, 2 parts;
ether for 3 or 4 days, and the
essed. *Used* as a vesicant, &c.

s"ric. This name was applied by
son to the CHLORIDE OF OLEFIANT
CH LIQUID;' and afterwards, by
Silliman, to CHLOROFORM, which
an alcoholic solution of chloride
. It now forms one of the syno-
roform. The medicinal 'CHLORIC
he shops is a solution of chloro-
, in rectified spirit, 8 parts; of
ose is 20 or 30 drops, in water,
smodic and anodyne. See CHLO-

.

rinet'ted. Formed by the action
ine on pure ether. When the
g continued, a heavy, oily pro-
LORINETTED ETHER), smelling
is formed. By the still further
orine, aided by sunlight, a white,
substance (PENTACHLORINETTED
mpound resembling sesquichloride
obtained.

'preous. *Syn.* TINCTURA CUPRI
HEREA, L. *Prep.* (Van Mons.)
copper, 6 parts, and chloride of
rts, are triturated together, and
digested in ether, 3 or 4 parts,
chloride of copper is dissolved.—
5 drops; in epilepsy, &c.

thy'lic. *Syn.* OXIDE OF METHYL,
, METHYL-ETHER; ÆTHER ME-
L. *Prep.* From wood-spirit, 1
ntrated sulphuric acid, 4 parts;
ort, apply heat, pass the evolved
lic ether) through a little strong
potassa, and then collect it over
See METHYL.

pirits of Nitrous. See SPIRITS.

Washed. *Syn.* ÆTHER LOTUS, L.
ether, agitated first with 2 or 3
olume of distilled water, and a few
arbonate of potassa, or a few drops
lime; and after decantation, again
ith a like quantity of water only.
halations. For other purposes the
er is afterwards digested on chloride
, to deprive it of retained water.

III. *Syn.* CAMPHOR OF OIL OF
volatile, white, crystalline substance,
by light oil of wine when left in a
tion for some time. It is isomeric
sole, and received its name from the
of its being the base of the
compounds. According to this hy-
ether is a hydrate of etherin.
lous brilliant prisms and plates; is
soluble in alcohol and ether; fuses
ble, and boils at 500° Fahr.; and is
ter than water. The crystals are purified by pressure between the folds of bibulous paper, solution in ether, and evaporation.

E'THEROLE. The yellowish, oily liquid, forming the residual portion of light oil of wine, after it has deposited its etherin. It is lighter than water; is freely soluble in both alcohol and ether; and has a rather high boiling-point. See ETHERIN and OIL OF WINE.

ETHION'IC AC'ID. *Prep.* An alcoholic solution of the crystals of sulphate of carbyle is diluted with water, the whole neutralised with carbonate of baryta, the filtered liquid evaporated by a very gentle heat to a small bulk, and a large quantity of alcohol added; the precipitate (ethionate of baryta) is treated (cautiously) with dilute sulphuric acid (avoiding excess), by which the baryta is withdrawn, and ethionic acid left in solution.

Prop., &c. Ethionic acid closely resembles sulphovinic acid. It is decomposed by heat. Its salts (ethionates), however, differ completely from the sulphovinates. They are all soluble in water, and are said to be anhydrous. The ethionates of ammonia, potassa, and soda, crystallise readily; those of lead, baryta, lime, and the other earths, are uncrystallisable. See ISETHIONIC ACID, and *below.*

ETHION'IC ANHY'DRIDE. *Prep.* Pure and dry olefiant gas is passed over anhydrous sulphuric acid ('sulphuric anhydride') contained in a U-shaped tube.

Prop., &c. When thus produced, it is in white, milky crystals, which speedily deliquesce in the air, giving rise to ethionic acid. It is similar in appearance, and probably identical with, 'sulphate of carbyle,' which results from the absorption of the vapour of anhydrous sulphuric acid by absolute alcohol.

E'THIOPS. *Syn.* ÆTHIOPS, L. A name given by the older chemists to several black powders, on account of their colour, and still occasionally employed in medical works.

Ethiops, Graphi'tic. *Syn.* ETHIOPS OF PLUMBAGO; ÆTHIOPS GRAPHITICUS, L. From plumbago, 2 parts; quicksilver, 1 part; triturated together until the globules disappear. —*Dose.* 5 to 10 grs.; in herpes, and some other obstinate skin diseases.

Ethiops, Martial. Black oxide of iron, prepared by keeping iron filings under water, and occasionally shaking them. It is washed with water, dried as quickly as possible, and preserved from the air, to prevent further oxidation. Formerly much esteemed as a tonic.

Ethiops, Min'eral. *Syn.* ETHIOPS MINERAL; ÆTHIOPS MINERALIS, HYDRARGYRI SULPHURETUM CUM SULPHURE, L. Black sulphuret of mercury, with excess of sulphur.

(Tyson's.) Oxide of mercury (prepared by decomposing calomel with an equivalent proportion of liquor of potassa to which a little *liquor of ammonia* has been added) and *flowers of sulphur,* equal parts, triturated together. This is recommended as an efficient substitute for the old and uncertain preparation commonly sold under the name of *Ethiops mineral*. It is, however, of more than double the usual strength, and should therefore be taken in proportionate doses. See MERCURY (Sulphuret).

Ethiops, Veg′etable. *Syn.* ÆTHIOPS VEGETABILIS, PULVIS QUERCÛS MARINÆ, L. Bladder wrack (*Fucus vesiculosus*), burned in a close vessel till it becomes black and friable. *Used* in bronchocele, scrofula, &c. Like burnt sponge, it owes its virtues to the presence of a very minute quantity of iodine.—*Dose.* 20 grs. to 1 dr., or more, made into an electuary with honey or sugar.

E′THYL. C_2H_5. *Syn.* ETHYLE. The hydrocarbon assumed to be the radical of the ether-compounds (ethyl-series). A body containing carbon and hydrogen in the proportions indicated by the formula of ethyl, $2(C_2H_5)$, has been obtained by exposing dry iodide of ethyl in sealed tubes for several hours to the action of finely divided zinc, at a temperature of from 320° to 338° Fahr. In this reaction the iodine of the iodide of ethyl combines with the zinc, and the hydrocarbon supposed to be ethyl is set free. On opening the sealed tubes and allowing the gas (which is a mixture of the 'ethyl' and certain secondary products) to pass into a freezing mixture, the temperature of which is kept below —9° Fahr., the 'ethyl' condenses to a colourless, mobile liquid. Hitherto no compound ether has been produced from the 'ethyl' thus prepared.

According to the beautiful theory of Liebig, ethyl is a 'salt-basyle,' forming 'haloid salts' with chlorine, iodine, and bromine; its oxide is ether, and the hydrate of this oxide alcohol. The compound ethers may be compared with ordinary salts in which the metal is replaced by the radical ethyl.

Ethyl, Oxide of. $(C_2H_5)_2O$. *Syn.* ETHER, SULPHURIC ETHER, ÆTHER (B. P.), ÆTHER SULPHURICUS (Ph. E. D. & U. S.), Æ. RECTIFICATUS, Æ. VITRIOLICUS, Æ. SPIRITUS VITRIOLI DULCIS, L. A colourless, highly volatile, fragrant, inflammable liquid, obtained by distilling a mixture of sulphuric acid and alcohol. It was not known before the 13th century.

Prep. There are two methods employed for the preparation of ether. The one is by mixing the whole of the ingredients at once, and immediately subjecting them to distillation at a proper temperature; the other is by adding the alcohol in a slender streamlet to the acid, previously heated to the etherifying point. The former, though less economical, is the one more generally employed.

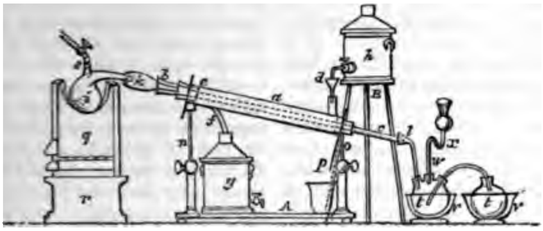
1. Rectified spirit, 3 lbs.; sulphuric acid, 2 lbs.; carbonate of potassa (previously ignited), 1 oz.; pour 2 lbs. of the spirit into a glass retort, add the acid, and place the vessel on a sand bath, so that the liquor may boil as quickly as possible, and the ether, as it forms, pass over into a well-cooled receiver; continue the distillation until a heavier fluid begins to pass over, then
lower the heat, add the remainde
and distil as before; mix the di
together, pour off the supernatai
the carbonate of potassa, and
sionally for one hour; finally, di
from a large retort, and keep it
pered bottle. Sp. gr. ·750.

2. The strongest oil of vitriol,
mixed with alcohol, q. s. (about
to reduce its sp. gr. to 1·780;
may be easily obtained by disti
of the ether, if required. The
then connected with a vessel ful
at least 90$\frac{o}{0}$, by means of a sma
furnished with a stop-cock; the
which should be of glass, and so
it just dips into the mixture of
hol. Heat is next applied, and
the still raised to the boiling-p
as possible, and as soon as full
mences the stop-cock of the syph
turned, so as to allow the alcoh
in such a manner as to keep the
exactly at the same level; or,
to supply a quantity of alcohol
to that of the liquid which di
careful manipulation the whole
which enters the retort passes o
water, and this decomposition pr
time, and would continue for
period, did not the sulphuric
become too weak to form etl
gradual absorption of the sup
contained in the alcohol. Were
or practicable to use absolute al
weight of sulphuric acid, of the p
would maintain the power of p
for an indefinite period. In
quantity of alcohol that may th
is twice or thrice as much as l
process, while neither sulphuro
vinic acid, nor sweet oil of win
and the residual liquid of the d
tinues limpid, and has only a pal
This is termed the 'continuous,'
method. (This process is simil
in the B. P.)

3. Alcohol of 90$^{\circ}_{0}$, five parts,
oil of vitriol, 9 parts, in a vessel of
immersed in cold water; the
introduced into a still or retort,
state of ebullition as rapidly
before. A fresh quantity of alc
bulk to the liquid distilled over,
to the liquid in the still, and dis
had recourse to. As much con
holic solution of potassa as will
ceptible alkaline reaction is n
distilled liquor, which is then r
heat of a water bath, as long as th
distils over has the sp. gr. ·720 t
Fahr. Instead of the potassa, a
lime may be used, along with its
water. By allowing the produ
some days over chloride of cal
lime, and again rectifying it

ances, perfectly pure ether may

Obs. The mixture of alcohol with sulphuric acid requires some caution. It is best done by



tube.
e.
which cold water runs in from the water
hich water escapes through *f* into the
mnecting the retort with the condenser.
mnecting the condenser with the bottles
vessel, with movable arms *n*, *o*, for sup-
sting the heights of the condenser.

B. Wooden stool for supporting the water bottle.

g. Furnace.

r. Support for the furnace.

p. Gutter for carrying off water that overflows the funnel *d*, and preventing its escape along the pipe *c*.

s. Leg of syphon connected with bottle containing alcohol.

t, t. Glass globes, placed in the basins *v*, *v*, and surrounded with pounded ice or ice-cold water.

w. Safety tube, containing a little mercury at *x*.

the alcohol into a suitable vessel,
ig to it a rapid whirling motion,
nsiderable conical cavity is formed
, and into which the acid may be
oured with perfect safety. The
should be brought to a state of
ion, as quickly as possible, as with-
caution much of the alcohol distils
the liquor acquires the proper
for etherification. On the small
bulated retort, connected with a
ndensing tube, and two globular
rrounded with a freezing mixture,
water, may be employed as the
apparatus. The second receiver
nnected with the first one by means
glass tube, reaching nearly to the
the former; and the whole of the
ld be securely luted, as soon as the
ir has been allowed to escape. We
yed the following convenient little
for the preparation of small quan-
ther, and it will be found very suit-
e distillation of most other highly
quids, and particularly for boiling
of alcohol and organic acids. By
g the neck of a flask or digester con-
tile fluids with the lower instead
per end of the refrigerator, ebullition
arried on without loss, as the vapour
ndensed, and run back into the vessel
ch it has distilled.
e rectification of ether, a water bath
d along with the above simple refri-
and the receivers surrounded by ice
ing mixture.
ps., *&c.* Ether is generally regarded
ide of ethyl, and alcohol as *the hydrate*
This view is borne out by analysis,
that ether differs from alcohol

by the elements of water. Recent experiments have also shown that the relation existing between the two compounds is—if alcohol be expressed by the formula C_2H_6O, the true formula of ether will be $(C_2H_5)_2O$. We cannot describe these experiments here, but we may remark that ether cannot be made to combine with water directly, nor can alcohol be converted into ether by the abstraction of water, pure and simple, without the aid of other substances.

The compound ethers may be compared to ordinary salts in which the metal is replaced by a radical termed ethyl, having the formula C_2H_5. This view is, of course, in accordance with the theory which regards ether as the oxide of ethyl.

According to theory, 1 equivalent, or 46 parts of absolute alcohol, should produce 1 eq., or 37 parts, of pure ether; but in practice, the greatest product obtained by operating according to Boullay's method, which produces more ether than any other, does not exceed 33½ parts for the preceding quantity of alcohol, or 71·5%. A mixture of 9 parts of oil of vitriol, and 5 parts of alcohol of 90%, ceases to produce ether after 31 parts of such alcohol have been added.

The most economical method of etherification is that known as the continuous ether process, or the process of Boullay. When this is adopted, the retort or flask should be fitted with a sound cork, perforated by an aperture to receive a thermometer, and the application of the heat, and the flow of alcohol, should be so managed, that a temperature of 300° Fahr. and a state of rapid and violent ebullition *(points of essential* importance) are maintained.

Prop., Uses, &c. Pure ether is a colourless, transparent, and very limpid fluid, having a penetrating and agreeable smell, and a burning, sweetish taste; its evaporation produces the sensation of extreme cold; when prevented, a sensation of heat is experienced. Its specific gravity varies between ·712 and ·724. If it contains water it begins to crystallise in brilliant white plates when cooled to —24° Fahr., and become a white crystalline mass at —46° or —47° Fahr.; but if absolutely pure, ether cannot be solidified by any degree of cold that can be produced, it remaining fluid when placed in contact with solid carbonic acid, at a temperature of about —148° Fahr. Boils at 96° or 97° Fahr.; is very combustible; is soluble in about 10 parts of distilled water, and mixes with alcohol in all proportions. It abstracts corrosive sublimate, terchloride of gold, sesquichloride of iron, and many of the alkaloids, from their watery solutions, and is hence invaluable in analysis and pharmacy. It readily dissolves the volatile and fixed oils, and most fatty matters, as well as sulphur and phosphorus in small quantities. By exposure to light and air it absorbs oxygen, and water and acetic acid are gradually formed. It is decomposed by exposure to a high temperature. Its evaporation occasions intense cold. The greatest degree of cold yet produced (—166° Fahr.) has resulted from the admixture of ether with solid carbonic acid. Ether is powerfully stimulant, narcotic, and antispasmodic, and externally refrigerant, if allowed to evaporate, or stimulant and counterirritant if its evaporation is prevented, and is used in various diseases. Applied to the forehead by means of the fingers or a strip of linen, it generally relieves simple cases of nervous headache. In *pharmacy*, it is largely employed in the preparation of tinctures, alkaloids, spirits, &c.; and in *chemistry* is invaluable in organic analyses. Its principal commercial application is as a solvent for pyroxyline, in the manufacture of collodion. It is also employed as a solvent of resins, India rubber, &c., in the preparation of varnishes, and for several other useful purposes.—*Dose.* 20 drops to 2 fl. drs.; in water or wine. Excessive doses of ether produce intoxication resembling that from alcohol, and require similar antidotes. Shortly before the discovery of chloroform, it was found that when the vapour of ether was inhaled it gradually produced insensibility to pain. It was therefore employed as an anæsthetic in surgical operations. Having been found less efficient than chloroform, and more troublesome to administer, its use for this purpose has been abandoned.

Tests. Ether may be recognised by its volatility, odour, taste, sparing solubility in water, admixture with alcohol in all proportions, great inflammability (burning with a yellowish-white flame), and its power of dissolving fats and resins. Its further identification can only be effected by ultimate analysis.

Pur. The ether of the shops, generally, contains alcohol, water, or acetic acid, times all of them. Its usual specific fluctuates between ·733 and ·765. the air, it volatilises entirely. It turns paper red; sometimes very slightly, sionally even not at all. ½ fl. oz. pletely with ½ pint of water. should, however, be neutral to although seldom so. When shaken measure with half its volume of solution of chloride of calcium, should not lessen. 10 fluid ounces should only dissolve 1 fluid ounce of remain transparent.

Preserv. Ether rapidly evaporates mon temperatures when kept in tles, and even in bottles secured with glass stoppers and tightly tied bladder and leather; it also become age. To prevent this waste, the should fit accurately, and the bottles placed in as cool a situation as possible. Bottles furnished with ground-glass caps, as well as stoppers, are frequently employed. (See *engr.*) Dewar's 'ether phial' is formed on a similar principle. We have seen bottles of ether accurately stoppered, tied over with bladder, and thickly coated with wax, which have yet become quite empty by a voyage to the tropics, still appeared to be as closely secure they were first filled.

Caution. The vapour of ether flammable, and when mixed with air, it forms a violently explosive mix density of this vapour is 2·586, being 1; hence it rapidly sinks, and accumulates in the lower parts of especially cellars which are badly in the same way as water does. remedy is thorough ventilation. accidents have arisen from this sooner is a light carried into an where such vapour is present, than sion takes place.

Ethyl, Acetate of. $C_2H_5C_2H_3O$ ACETATE OF OXIDE OF ETHYL, ACET PYROLIGNEOUS ETHER; ÆTHER AC A compound discovered by the Lauraguais in 1759.

Prep. 1. Acetate of potassa, 3 par equiv. quant. of acetate of soda), alco 3 parts, oil of vitriol (strongest), 2 mixed together and distilled, by the sand bath, from a glass or earthenwa into a well-cooled receiver; the di agitated with a little water to rem composed alcohol, and then digested a little chalk, to remove acidity, wards with fused chloride of calcium, water; it is, lastly, rectified by a gen

2. Rectified spirit (sp. gr. ·84), acetic acid (sp. gr. 1·075), 33 parts, together, and oil of vitriol (stronges

tillation is continued until 65
ed over, and the distillate, after
me hours on a little dry carbo-
ium, is rectified as before, the
aly being kept for use.

Acetic ether is colourless, and
rable resemblance to ordinary
as a much more agreeable and
r. It boils at 165° Fahr.; has
at 60° Fahr.; dissolves in about
r; and mixes in all proportions
d ether. It is decomposed by
strong acids.

is diaphoretic, stimulant, anti-
narcotic.—*Dose.* ½ to 2 fl. drs.;
to those in which sulphuric
red, and especially in nervous
ers, spasmodic vomitings, and
bowels and stomach, arising
nd not of an inflammatory cha-
rincipal consumption is in the
British brandy.

ate of. $C_2H_5C_7H_5O_2$. *Syn.*
, BENZOATE OF ETHER, B. OF
IYL; ÆTHER BENZOICUS, L.
(sp. gr. ·830), 4 parts, benzoic
2 parts, concentrated hydro-
part, are distilled together;
roduct turns milky when mixed
receiver is changed, and the
ils over collected; to this liquid
, and the supernatant ether is
boiled with water and a little
to separate benzoic acid); it is,
m water by allowing it to stand
f calcium.

colourless, oily liquid, slightly
ater, and possessing an aromatic
. It boils at 410° Fahr., and is
lcohol and ether.

ide of. C_2H_5Br. *Syn.* ÆTHER
, L. A volatile, ethereal
ed by Serullas.

ine, 8 parts; alcohol, 32 parts;
the mixture in a retort, add of
part, and distil by a gentle heat
liquid becomes cold. The ether
m the distillate by the addition

A very volatile liquid, with a
ste and smell; boiling at 105°
vier than water.

rate of. $C_2H_5C_4H_7O_2$. *Syn.*
R, PINE-APPLE OIL; ÆTHER

Prep. By passing hydrochloric
an alcoholic solution of butyric
ying the product from free acid.
y, from crude butyric acid sapo-
stic potassa or baryta, and the
distilled along with alcohol and

e butyric ether forms the 'pine-
ssence, and when largely di-
ctified spirit, the 'pine-apple
uch employed as a flavouring
nfectioners, liqueuristes, &c. It imparts a delicious flavour to sweetmeats, rum, arrack, punch, &c. The Germans add it to common rum, to form the flavouring for their 'pine-apple ale.'

Ethyl, Carbonate of. $(C_2H_5)_2CO_3$. *Syn.* CARBONIC ETHER, CARBONATE OF OXIDE OF ETHYL; ÆTHER CARBONICUS, L. *Prep.* Fragments of potassium are added to oxalic ether, gently warmed, as long as bubbles of gas are formed; the excess of metal is removed from the semi-solid mass, some water added, and the whole distilled. The carbonic ether floats on the surface of the liquid in the receiver, and is collected, dried by contact with chloride of calcium, and rectified along with some potassium or sodium, till it ceases to yield acetate of potassa when acted on by caustic potassa.

Prop., &c. Colourless, limpid, and aromatic; tastes pungent and burning; boils at 259° to 260° Fahr. It greatly resembles oxalic ether. It is decomposed by alkalies.

Ethyl, Chlo'ride of. C_2H_5Cl. *Syn.* LIGHT HYDROCHLORIC E., CHLORIDE OF ETHYL; ÆTHER HYDROCHLORICUS, L. A highly volatile compound, formed of ethyl and chlorine.

Prep. Rectified spirit of wine is saturated with dry hydrochloric acid gas, in the cold, and the product is distilled in a retort connected with a Woolfe's apparatus, the first bottle of which should be two thirds filled with tepid water (70° to 75° Fahr.), and the remainder surrounded with a mixture of ice and salt. To render it perfectly anhydrous, it must be digested on a few fragments of fused chloride of calcium.

A mixture of oil of vitriol, 3 parts, and alcohol, 2 parts, is poured upon common salt (dried), 4 parts; and the whole distilled as before.

Prop., &c. This ether has a sweetish taste; is soluble in about 15 parts of water, and miscible in all proportions with alcohol; boils at 54° Fahr.; burns with a flame edged with green; is neutral to test-paper; and does not affect a solution of nitrate of silver. Sp. gr. ·921, at 32° Fahr.—*Dose.* 10 to 30 drops, as an antispasmodic and a powerful diffusible stimulant. Owing to its extreme volatility, it can only be taken dissolved in spirit.

Ethyl, Cy'anide of. C_2H_5CN. *Syn.* ÆTHER HYDROCYANICUS, L. *Prep.* Cyanide of potassium and sulphovinate of baryta, equal parts, are mixed and distilled in a glass retort by a moderate heat. The product separates into two strata; the lighter one is impure hydrocyanic ether; this is decanted and agitated with 4 or 5 times its bulk of water at 120° to 140° Fahr., and the operation is repeated with about 2 parts of water; the ether is again decanted, and placed in contact with chloride of calcium for 24 hours, and then rectified.

Prop., &c. It boils at 190° Fahr. Sp. gr. ·788. In its therapeutical effects it resembles hydrocyanic acid, but is less active. Its odour is, however, more penetrating and offensive.—*Dose.* 2 to 6 drops, in mucilage or emulsion;

in obstinate or convulsive coughs, gastrodynia, hysterical affections, &c.

Ethyl, Cy'anate of. C_2H_5CNO. *Syn.* CYANIC ETHER, CYANATE OF OXIDE OF ETHYL. *Prep.* By distilling a dry mixture of cyanate of potassa and sulphovinate of potassa, in nearly equivalent proportions. A mixture of cyanic and cyanuric ethers passes over into the receiver. By distilling this mixture the two are readily separated; that which passes over by the heat of a water bath being the first, and the residuum in the retort the second.

Prop., &c. An ethereal, very mobile liquid, boiling at 140° Fahr.

Ethyl, Cyan'urate of. $(C_2H_5)_3C_3N_3O_3$. *Syn.* CYANURATE OF OXIDE OF ETHYL. *Prep.* See CYANIC ETHER.

Prop., &c. Tasteless, inodorous, colourless, transparent needles and prisms; fusing at 185° Fahr.

Ethyl, I'odide of. C_2H_5I. *Syn.* ÆTHER HYDRIODICUS, L. *Prep.* Phosphorus, 4 parts, alcohol (sp. gr. ·84), 70 parts, and iodine, 100 parts, are gradually and cautiously mixed together, and distilled.

Prop., &c. A colourless liquid, possessing a strong ethereal odour, and boiling at 158° Fahr.; sp. gr. 1·92. It is reddened and decomposed by exposure to air and light.

Ether, Methy'lic. *Syn.* OXIDE OF METHYL, WOOD-ETHER, METHYL-ETHYL. See METHYL.

Ether, Muriatic (Heavy). *Syn.* ÆTHER MURIATICUS PONDEROSUS, L. *Prep.* Alcohol, of 80 to 85%, is saturated, in the cold, with chlorine gas, water is next added, and the oily fluid that separates collected and washed with water, as long as any of it is dissolved.

Prop., &c. Heavy muriatic ether is a volatile, oily, colourless liquid, boiling at about 245° Fahr., and heavier than water. Its precise constitution is undetermined. This ether enters into the composition of the SPIRITUS MURIATICO-ETHEREUS, a remedy occasionally used on the Continent.

Ethyl, Nitrate of. $C_2H_5NO_3$. *Syn.* NITRIC ETHER, NITRATE OF OXIDE OF ETHYL; ÆTHER NITRICUS, L.

Prep. Nitric acid (sp. gr. about 1·375), 50 parts; nitrate of urea, a little (say 2 or 3 parts); dissolve, add alcohol, 50 parts, and distil with the usual precautions, until 7-8ths of the whole (of the liquid portion) have passed over; agitate the distillate with a little water to separate the ether, and preserve the heavier portion.

Prop., &c. Nitric ether possesses an agreeable sweetish taste and odour; it is insoluble in water; the alcoholic (but not the aqueous) solution of potassa decomposes it rapidly; sp. gr. 1·112. Its vapour is very apt to explode when strongly heated, and, therefore, a small quantity only should be prepared at a time.

Ethyl, Nitrite. $C_2H_5NO_2$. *Syn.* NITRIC ETHER, HYPONITROUS ETHER, NITRITE OF ETHER, NITRITE OF OXIDE OF ETHYL, HYPONITRITE OF E.; ÆTHER NITROSUS, Æ. HYPONITROSUS, L. This is a compound, of which 'sweet spirit of nitre' is an i
solution.

Prep. Starch (potato farina),
acid (sp. gr. 1·30), 10 parts;
cious retort, connected with a
3 feet long, bent at right ang
nating near the bottom of a two
containing a mixture of alco
parts, and water, 1 part, and s
a freezing mixture, pounded i
water; the other neck of the b
nected by a long glass tube wi
gerator or condenser. All elev
rature must be avoided. The
bath only must be cautiously
retort. The gas liberated
alcohol, causing the ether to d
stream. The tube connecting
bottle must be cooled by means
paper, kept wetted with ice-col
the temperature of the tube
rises only a little, the latter b
neously hot, and boils violentl
product is vitiated. This proc
ductive and economical, and yie
ether.

A mixture of oil of vitriol, 8
hol, 9 parts, is poured upon cry
of ammonia, 11 parts, contain
able distillatory vessel connect
cooled receiver. Nitrous ether
over on the application of a g
admirable process, but more
the preceding. Even a comm
employed without danger, as t
the ether proceeds gradually,
instantaneously, as in operati
way. Sulphate of ammonia is l
The product is scarcely inferio
last formula.

Rectified spirit, 46 fl. oz.;
(sp. gr. 1·500), 7 fl. oz.; put
spirit, with a little clean san
matrass, fitted with a cork, an
reaching to within an inch of
second tube leading to a refr
the safety tube with pure ni
add through it, gradually an
fl. oz. of the acid. When th
that ensues is nearly over, gr
remaining portion of the aci
time, and at intervals. Agitat
distils over, first with a little
it ceases to redden litmus pape
half its volume of concentra
chloride of calcium. The p
ether thus obtained should
of ·899.

Prop., &c. Pure nitrous e
yellow colour, an agreeable
and boils at 62° Fahr.; sp.
Fahr. Commercial nitrous
aldehyd, boils at 70° Fahr., h
suffocating odour combined w
pure ether, has a sp. gr. of ·8
and turns brown when mi

tassa, while the latter remains
also acidifies by age, whilst pure
remains neutral. They are both
ble, and burn with a white flame.
ous ether dissolves in about 48
r, and mixes in all proportions
nd sulphuric ether.
her is refrigerant, diaphoretic,
but is seldom employed alone,
largely diluted with alcohol
of nitre, spirit of nitric ether),
on remedy in several diseases.
ed to flavour malt spirit, in imi-
ndy (British brandy), although
ose it is vastly inferior to acetic
PIRITS (Medicinal).
anthate of. *Syn.* ŒNANTHIC
RGONIC ETHER, ŒNANTHATE OF
HYL. *Prep.* 1. The oil obtained
nd of the distillation of fermented
ially wines, consists, in a great
he crude ether. It is purified by
h a weak solution of carbonate of
l from water by a few fragments
f calcium, and then re-distilled.

Œnanthic ether is colourless;
water; boils at about 500° Fahr.;
owerful intoxicating vinous odour,
that of an empty wine cask or
has been exposed to the air for
It is very sparingly soluble in
ely soluble in alcohol. Its sp. gr.
obtained by distillation, it is
a little ŒNANTHIC ACID. 2200
ons of wine (about 35 hogsheads)
2¼ lbs. of the mixed oil.
late of. $(C_2H_5)_2C_2O_4$. *Syn.* OXALIC
LATE OF OXIDE OF ETHYL; ÆTHER
. *Prep.* Alcohol and dry oxalic acid,
are digested together in a glass
ed with a very long glass tube of
so that the spirit, volatilised by the
be condensed, and flow back into
After 6 or 8 hours the process is
omplete, and the liquid contains
ace of free acid, from which it may
d.
e. A colourless, oily liquid, slightly
an water, boiling at 363° Fahr.,
ly soluble in water, and having an
mell. Alkalies decompose it. Sp.

lphate of. $(C_2H_5)_2SO_4$.
The vapour of pure anhydrous sul-
id is passed (with the usual precau-
perfectly anhydrous ether; the re-
upy liquid is agitated with a mixture
es of water, and 1 volume of ether,
repose the upper stratum, which is
l solution of the sulphate of ethyl,
d, and the oxide of ethyl volatilised
gentle heat. The colourless liquid
the residuum is the true sulphuric
lphate of ethyl just referred to. It
unstable *compound, and cannot be*
without suffering decomposition.

Ethyl, Valerianate of. $C_2H_5C_5H_9O_2$. *Syn.* VALERIANIC ETHER, VALERATE OF OXIDE OF ETHYL; ÆTHER VALERIANICUS, L. *Prep.* By passing dry hydrochloric acid gas into an alcoholic solution of valeric acid. It is a fragrant, volatile liquid, lighter than water, having a high boiling-point, and a rich fruity odour, said to closely resemble that of butyric ether or pine-apple oil. It is used to flavour liqueurs, &c.

ETHYL'AMINE. $NH_2(C_2H_5)$. *Syn.* ETHYL-AMMONIA. One of the bases of the ethyl-series, obtained by substituting one atom of hydrogen in ammonia NH_3 by ethyl C_2H_5.

EUCALYP'TIN. A peculiar substance existing in Botany Bay kino. It has been employed medicinally in diarrhœa.

EUCHLO''RINE. A bright-yellow gas, prepared by gently heating chlorate of potassa with hydrochloric acid. It is probably a mixture of chlorous acid and free chlorine.

EUPHOR'BIUM. *Syn.* GUM EUPHORBIUM; EUPHORBIUM (Ph. E.), L. The concrete resinous juice of the *Euphorbia canariensis*, and other species of the same genus. It is a powerful acrid, purgative, rubefacient, sternutatory, and vesicant, and the violence of its action has led to its disuse.

EU'PIONE. An ethereal liquid forming the chief portion of the light oil of wood-tar, and which also exists in the tar obtained during the destructive distillation of animal substances, and in the fluid product of the distillation of rape oil. It is separated from these substances by agitating them with oil of vitriol, or a mixture of oil of vitriol and nitre, and subsequent cautious distillation. Pure eupione is tasteless, exceedingly thin, limpid, and aromatic; boils at 116° Fahr.; and is the lightest fluid known; sp. gr. ·655. It is very inflammable, burns with a very bright flame, and gives a transient greasy stain to paper. It is isomeric with hydride of amyl. Other volatile hydrocarbons of like origin are often confounded with eupione by chemical writers.

EUPYR'ION. Any contrivance for obtaining instantaneous light; as a lucifer match, &c.

EVAC'UANTS. *Syn.* EVACUANTIA, L. Medicines which augment the secretions or excretions. CATHARTICS, DIAPHORETICS, DIURETICS, EMETICS, ERRHINES, EXPECTORANTS, and SIALOGOGUES, belong to this class.

EVAPORA'TION. The conversion of a fluid into vapour by means of heat, diminished atmospheric pressure, or exposure to a dry atmosphere. Evaporation is had recourse to —1. For the vapour as a source of heat or power, as in the case of steam-boilers, &c.; —2. To separate volatile fluids from impurities or other bodies, which are either fixed or less volatile;—3. To recover solid bodies from their solutions, as in the preparation of extracts, *chemical salts, &c.*;—4. To concentrate or *strengthen a solution* by the expulsion of some *of the fluid matter* that forms the menstruum;

—5. To purify liquids by the dissipation of the volatile matters which may contaminate them.

It is found that, under ordinary circumstances, evaporation is confined to the surface of the heated liquid, and is therefore slower or quicker, in proportion to the extension of that surface. Hence has arisen the adoption of wide, shallow vessels for containing fluids during their exposure to heat for this purpose. Evaporation proceeds most rapidly when a current of air (especially hot and dry air) is made to pass over the surface of the fluid; as, in this case, the vapour is prevented resting upon the surface, and impeding the process by its pressure. For a similar reason, liquids evaporate more rapidly in vessels partially covered than in open ones. In the former case the cool incumbent air condenses and throws back a portion of the vapour, which thereupon, besides its cooling action, offers mechanical resistance to the diffusion of the vaporous particles as they arrive at the surface of the liquid. In the latter case these obstacles are avoided, and the impetus of the vapour pouring forth from a contracted orifice (or pipe), not only readily overcomes the pressure of the atmosphere, but offers less surface for its cooling action, until it has passed much beyond the points at which it can exert any influence on the fluid from which it has escaped. In this way the chemical action of the atmosphere on the liquid operated on is also considerably lessened. On the small scale, shallow capsules of glass, wedgwood-ware, porcelain, or metal, are commonly employed as evaporating vessels, and these are exposed to heat by placing them over a lamp, or naked fire, or in a water bath, or sand bath, according to the temperature at which it is proper to conduct the process. On the large scale, high-pressure steam is usually employed as the source of heat. The term ‘spontaneous evaporation’ is applied to the dissipation of a fluid by mere exposure in open vessels, at the common temperature of the atmosphere, and without the application of artificial heat. The celerity of this species of evaporation wholly depends on the degree of humidity of the surrounding air, and differs from the former, in which the rate of evaporation is proportionate to the degree of heat at which the process is conducted, and the amount of pressure upon the surface of the liquid. Evaporation ‘*in vacuo*’ (as it is called) is conducted under the receiver of an air-pump, or in an attenuated atmosphere, produced by filling a vessel with steam, by which means the air is expelled, when all communication with the external atmosphere is cut off, and the vapour condensed by the application of cold. Fluids are also evaporated in air-tight receivers over sulphuric acid, by which they are continually exposed to the action of a very dry atmosphere. When such a receiver is connected with an air-pump in action, evaporation proceeds with increased rapidity, an
is produced. It appears, from
ments of Dr. Ure, that “if the
pan, and the portion of the side
a hot fluid medium (solution
calcium, for example), be corru
contain a double expanse of m
that pan will evaporate exact
quantity of water, in a given
like pan, with smooth bottom
do, immersed equally deep in t
If the corrugation contain th
quantity of metallic surface, th
will be threefold in the above
But if the pan, with the sa
bottom and sides, be set over a
oblong flue, so that the current
sweep along the corrugations,
rate no more water from its i
smooth pan of like shape and din
alongside it in the same flue, or
fire.”

In the laboratory, steam heat
exclusively employed. Coppe
glazed, or silvered coppered pa
stills, are surrounded by a ‘jacke
and high-pressure steam adm
the two. By due management
cock, a range of temperature
obtained extending from abo
Fahr.

It is found that, under or
stances, 10 square feet of heat
evaporate fully 1 lb. of water pe
that a thin copper tube exposi
face will condense about 3 lbs
minute, with a difference of t
about 90° Fahr. This is equa
per lb.; and, consequently, th
steam employed to produce th
should be 212° + 30° = 242° Fa

An attention to the facts and
briefly explained above will be
value in the laboratory.

EXCIP'IENT. See PRESCRIP

EXCI'TANTS. See STIMULA

EXCORIA'TIONS. Syn. SPRA
In *surgery* and *pathology*, superf
affections of the skin, consisting
of the scarf-skin or cuticle, acc
more or less irritation and sli
tions. When arising from rou
attrition, they are more com
abrasions. Young children are
chafed under the arms, behind th
the thighs, and in the wrinkle
the skin generally, unless gre
paid to cleanliness, and wiping
fectly dry after washing them
there is a tendency to excoriatio
either in adults or children, a lit
dered starch, or violet powder, ap
of a puff, or a small bag of u
twice a day, will generally rem
prevent their occurrence in futu
guents, as cold cream, or sperm

y also be used with advantage.
ce should, however, be given to
first named, from their not soiling
ee ABRASION.

is essential to the healthy per-
the functions of both body and
out it, the stomach acts feebly,
come inactive, and the circulation
languid and imperfect; the chest
e respiration becomes impeded,
insufficiently supplied with pure
d, the mind grows lethargic, the
assumes a sickly and effeminate
whole features lack the energy
on which they possess in perfect
h exercise, the bodily functions
d with vigour and regularity, by
onstitution is strengthened, and
of disease repelled. By exercise
o is excited to healthy action, its
ies are dispelled, and the fair face
presented to the mind's eye in its
It robs undue mental exertion
injurious effects upon the body,
ulates and directs it in its proper
proves the temper, and humanises
r. The disposition is refined, the
rained, violent emotions checked,
nproved, and the personal charms
nder the stimulus of judicious

es, bodily exercise is even more
an to males. The disposition and
females are such as to tend to pro-
of sloth and indolence to a greater
in the other sex. Hence to them
loubly important—it is inseparable
. The more retiring dispositions
lead them almost unconsciously
of inactivity, which, above all, they
eavour to shake off and avoid. By
by replacing habits of indolence and
by liveliness and moderate exercise,
pment of the body will be promoted,
grace and elegance imparted to its
vements, and the enjoyments arising
mental and bodily health increased,
ase and deformity will be prevented
noval of their cause.

ssity of exercise exists equally in
de of society and age of life. Those
ngaged in sedentary employments or
ccupations, should particularly seek
out-door exercise, during the periods
tion from their diurnal duties. To
ns and delicate of both sexes, this is
necessary to preserve the health and
the body.

ancy, exercise of a suitable kind
almost the constant occupation of
beings that claim our protection and
should, however, be always borne in
the muscular exercise of very young
ust be of the gentlest class. Preju-
ignorance frequently *induce nurses*
to teach their children to walk, as they falsely call it, and thus their feeble limbs are urged to make premature efforts to totter along, before the bones and muscles have acquired sufficient strength to support the body in an erect position. From this course the legs and joints frequently become bent and misshapened, and severe injuries are often inflicted on the head and body by blows and falls. It should never be forgotten, that crawling and rolling are their first modes of progression, and require the least exertion. Next comes the sitting posture; from this the child gradually advances to the erect one; then to walk by slight assistance; and, lastly, to walk safely alone. All this should come naturally, and never be promoted, further than by laying the infant on the carpet or floor, for the full exercise of its little strength. As soon as a healthy child is able to walk instead of crawl, its own disposition induces it to do so. The faculty of imitation, the spirit of enterprise, and the pride of doing what others do, present even in infancy, is rather apt to lead the infant to over-exertion than the contrary. The practice of constantly 'dolling' children in the arms is most prejudicial to the early development of their feeble powers.

In childhood the exercise should be regulated according to the constitution and age of the parties; avoiding inactivity, on the one hand, and excessive exercise on the other. The out-door plays and pastimes of BOYS will generally be found sufficient, and in some cases will even require to be curbed, to prevent fatigue and the overtasking of the young frame. With girls, it is frequently difficult to find sufficient exercise without trespassing on the prejudices of the ignorant, or the routine of their daily education. With them, walking, and some healthy amusement, as skipping, hooping, or the like, should be indulged in for some hours daily. When this is impossible or inconvenient, they may be habituated to the practice of the more simply and cleanly portion of the domestic duties. In the performance of the latter, the health will be promoted, whilst the care and attention which is always due by a female to herself and others, at all periods of her life, will become an easy acquisition, and assist the cultivation of the best feelings of her nature.

In youth exercise matures and promotes the development of the frame; and in manhood it is equally necessary, as already noticed, to keep it in healthy action. In age it will be found to assist the vital functions, and put off decay. In fact, to all—young, old, rich, and poor, physical exercise is essential to the permanent enjoyment of health.

In a medical point of view, "exercise, employed moderately, has a tonic and stimulating influence on the system, and is calculated to prove beneficial in a great variety of complaints. Used immoderately, it exhausts both *the mental and bodily* powers, and produces *great debility*." (Pereira.) Well-directed exercise favours the preservation of the general health, by calling into direct action the majority of the organs of the body; and it also acts powerfully on the skin, by stimulating its functions, increasing its temperature, awakening its tone, and subjecting it to a current of atmosphere favorable to its respiratory offices. But to be beneficial in the highest degree, exercise must be accompanied by feelings of present interest and enjoyment. The mind must direct and go with it; to ensure its full benefits, the "soul must be present."

"During convalescence, properly regulated exertion is highly serviceable; but it should never be carried so far as to produce exhaustion, and should be pursued for some time in doors, before it be attempted in the open air; the latter, at first, should always take place in a carriage, that can be opened or closed at will; the patient may then attempt short walks in the open air; but, in all cases, it is of importance that he is not unduly fatigued, as, otherwise, injury instead of benefit will be the result. One of the most serious errors, committed with regard to exertion, is that of permitting a convalescent to sit up too frequently, or for too long a time, under the mistaken notion of giving him strength. A patient should never be allowed to sit up longer than is agreeable to his feelings, and never so long as to produce a sense of fatigue." (Dr. R. E. Griffith.)

EXPAN'SION. All substances, solid, liquid, and gaseous, when chemical change does not take place, expand by heat, and contract by cold. In some of them this property occurs in a greater degree than in others, but is constant for the same substance under the same circumstances. The chemist avails himself of this property in the construction of his thermometer; the wheelwright, in fixing on the tire of his wheels; the engineer, in restoring to the perpendicular the leaning walls of buildings; &c.

This expansion by heat is of great importance in the manufactures, as allowance has to be made of it in every purpose where metals are employed.

The following is a list of the expansion of the chief metals, &c., when heated from 32° to 212 Fahr, or from 0° to 100° Cent:—

Substance.	*Expansion.*	
	In bulk.	In length.
Glass	1 in 384	1 in 1150
Platinum	1 „ 377	1 „ 1311
Steel	1 „ 309	1 „ 926
Iron	1 „ 282	1 „ 846
Gold	1 „ 227	1 „ 682
Copper	1 „ 194	1 „ 582
Brass	1 „ 179	1 „ 536
Silver	1 „ 175	1 „ 524
Tin	1 „ 172	1 „ 516
Lead	1 „ 117	1 „ 351
Zinc	1 „ 113	1 „ 340

Of the liquids, they expand as follows, when heated from 0° to 100° Cent.,
212° Fahr:—

Mercury . . . . 1 in
Water . . . . . 1 „

Gases practically all expand
say, for every degree Fahren
pands $\frac{1}{491}$ of its bulk at 32°,
degree Centigrade $\frac{1}{273}$ of th
0° C.

An example will show the
this. Suppose an iron bar,
sides of a building, and of a len
feet. The increase in length
bar would make it 1 inch lon
than in winter; and it would,
be made, pull or thrust the wal
each year.

EXPEC'TORANTS. *Syn.* E
L. Medicines that promote
the trachial and bronchial muc
to Dr. Good, true expectorai
medicines which rather promot
of the viscid phlegm with whic
are loaded, than simply invis
it; though these are also trea
rants by many writers." Am
monials, assafœtida, the balsa
tolu, benzoic acid, benzoin; the
gar, tar, and several of the vola
ipecacuanha, the oleo-resins, sq
antimony, and the smoke of to
monium, are among the princ
commonly called expectorant
antimony, squills, chlorine, a
gases, have also been used (dilu
the coughing and favour the
foreign bodies from the air-pass
to favour the expectoration of
membranous concretions, when
tion is not sufficiently great.
Expectorants are commonly e
monary complaints and affecti
tubes, attended by a vitiated
mucus, or an imperfect perfo
natural functions of the sec
"Of all classes of the materi
are more uncertain in their acti
torants." (Pereira.) The ac
matter from the chest is calle
TION.

EXPER'IMENTS are acts
intended to develop some unkn
ciple, or effect; or to establish
it, when discovered. Similar o
formed merely for amusement,
though incorrectly, called by
rational experiments these tw
combined. To experimental
the present high state of ad
usefulness of the various scien
mately connected with our happ
being. The danger of taki
granted has been thus pleasant
tively pointed out by Archbisho
"It was objected to the sy

irst brought forward, that if the
on its axis, as be represented, a
l from the summit of a tower
. at the foot of it, but at a great
e west; in the same manner as a
l from the masthead of a ship in
not fall at the foot of the mast,
e stern. To this it was answered,
being a part of the earth, obeys
, and moves with it; whereas it
he ship, of which, consequently,
independent. The solution was
some, but opposed by others;
oversy went on with spirit; nor
e hundred years after the death
that, the experiment being tried,
ined that the stone, thus dropped
d of the mast, *does* fall at the

TION. (Exportation on Draw-
aw, a certain allowance, or draw-
, is payable on certain articles,
ed from any part of the United
her as merchandise or ship stores.

ined in the United Kingdom, from
· cwt., according to quality.
manufactured in the United
. 3*d*. per lb. The full drawback
ed on normal tobacco, which con-
cent. of moisture. If the moisture
er cent., a proportionate reduction
he drawback; if it is found less
cent., a proportionate increase is

entitled to drawback at 3*s*. 3*d*.
ect, however, to an increase, if the
less than 13 per cent., and the in-
ter not over 18 per cent., and to a
' the moisture in organic matter
e per-centages.
The amount of this drawback is
l to the quantity of malt or sugar
brewing of the beer, and is nearly
to the duty originally paid on such
gar. It is computed according to
ng scale:—For every barrel, or 36
beer, the original gravity of which
s than 1040°; a drawback of 4*s*. 3*d*.,
ery additional 5 degrees, from 1040°
inclusive, a further sum of 6*d*. per

TED Worts, made by a licensed
om malt or sugar, or malt and sugar,
k of 2*s*. $10\frac{5}{103}$*d*. per 28 lbs.
Under certain restrictions, a draw-
e duty charged, after deducting 7½
of the measured quantity.
, from 10*s*. to 10*s*. 3*d*. per proof

es samples are taken by the Custom
cer, and forwarded to the Inland
boratory, where they are examined
the payment of the drawback.
SSION. In the *useful arts*, the me-
ration by which a fluid contained in the pores or cells of a solid is pressed out or expelled. Many of the fluid substances employed in pharmacy and chemistry are obtained by expression. Thus, the unctuous vegetable oils, as those of almonds, linseed, &c., are procured by submitting these substances to powerful pressure between iron plates, which are either made warm, or the bruised seeds are previously exposed in bags to the steam of boiling water. The juices of fresh vegetables are also obtained by expression. The substances are first bruised in a marble mortar, or, on the large scale, in a mill, and immediately submitted to the press, to prevent them passing into a state of fermentation, which would injure the quality of the product. Fruits which contain highly flavoured or fragrant seeds, or which have rinds containing essential oil, are generally deprived of them before being sent to the press. The subacid fruits are also allowed to lay together for some days before pressing them, as the quantity and quality of the product is thereby increased. The fluid matter absorbed by the ingredients employed in the preparation of tinctures, infusions, decoctions, extracts, &c., is generally obtained by powerful pressure. Expression is also frequently had recourse to for the purpose of obtaining solids in a state of purity, as in the expulsion of oleine from stearine, water from bicarbonate of soda, &c. On the small scale, the common screw-press, or one of like construction, is usually employed; but the power thus obtained is insufficient to expel the whole of a fluid diffused through the pores of a solid. Hence has arisen the use of the hydraulic press, which is now almost alone employed on the large scale. In all these cases the substances are placed in bags made of haircloth, or coarse canvas, previously to their being submitted to pressure. For tinctures and like pharmaceuticals, a small screw-press (tincture press) made of 'galvanised' or tinned iron, and varying in capacity from 1 quart to several gallons, is employed.

EXSICCA'TION. See Desiccation.

EX'TRACT. *Syn.* Extractum, L. Among *chemists*, this term is understood to apply to the residuum of the evaporation of aqueous decoctions or infusions of vegetable matter. In *medicine* and *pharmacy*, it has a less definite signification, being applied to various preparations obtained by evaporating the expressed juices, or the decoctions, infusions, or tinctures of vegetable substances, until a mass, of a solid or semi-solid consistence, is formed. Extracts vary in their nature and composition with the substances from which they are prepared, and the fluids employed as solvents. When water is employed as the menstruum, the products (aqueous extracts, watery e.; extracta aquosa, e. simpliciora, L.) usually consist of gum, starch, sugar, albumen, extractive, and saline and other matter, along with the *peculiar principles* on which the medicinal *virtue of the* vegetable depends. When spirit is employed as the solvent, the products (ALCOHOLIC EXTRACTS; EXTRACTA ALCOHOLICA, L.) contain most of the substances above enumerated, except the gum and starch, together with several other substances which are soluble in spirit, but which are either wholly or nearly insoluble in water; as resins, essential oils, and the proximate principles of vegetables. These preparations, with scarcely an exception, are considerably more powerful than the aqueous extracts of the same vegetables. In some cases proof spirit or under-proof spirit is employed, when the extracts (SPIRITUOUS EXTRACTS; EXTRACTA SPIRITUOSA, L.) generally possess properties between those of the above. In other cases, dilute acetic acid or acidulated water is employed as the menstruum, when the products (ACETIC EXTRACTS; EXTRACTA ACETICA, L.) possess much greater activity than when prepared with water; and would in many cases prove fatal, if exhibited in doses as large as those of the aqueous extracts. Still more active extracts are obtained by a combination of the last two menstrua. According to Ferrari, plants treated with rectified spirit of wine, mixed with $\frac{1}{16}$th part of acetic acid, yield extracts of remarkable activity. On the Continent, ether is sometimes used as the menstruum for the active principles of certain substances, as cantharides, cubebs, worm-seed, &c. (ETHEREAL EXTRACTS; EXTRACTA ETHEREA, L.). The term 'simple extract' is applied to an extract prepared from a single plant or vegetable substance, and the term 'compound extract' to one prepared from two or more of such substances. The FLUID EXTRACTS (EXTRACTA FLUIDA, L.) of modern pharmacy are those which are only evaporated to the consistence of a thin syrup, and then mixed with 1-10th to 1-8th of their volume of rectified spirit.

Prep. The preparation of medicinal extracts may be conveniently considered under two divisions, viz.—1. The production of a solution of the soluble portion of the substances operated on; and, 2. The reduction of this solution by evaporation to the consistence of an extract.

I. PREPARATION OF SOLUTIONS:—The preliminary operations in the manufacture of extracts are similar to those employed in the preparation of DECOCTIONS, INFUSIONS, and TINCTURES. The proper quantity of the ingredients being taken, the whole is well bruised or reduced to coarse powder, or otherwise divided by slicing with a knife, that every portion may be fully exposed to the solvent action of the fluid. In some few cases (as with gentian, &c.) the 'slicing,' or reduction to fragments, is often conveniently deferred until the action of the menstruum shall have so far softened the ingredients as to render them of easy division by the knife. Those substances (as sarsaparilla, chamomiles, &c.) whose medicinal principles reside in the cortical portion, or which are of easy solubility, are commonly

subjected to the action of
without being subjected to an
paration.

In the preparation of AQU
the ingredients are treated wi
the soluble matter that it is d
is dissolved out. There are
of effecting this object, dep
nature of the substances act
cases, maceration in cold wat
in others, percolation with
'displacement apparatus.'
however, boiling water is po
stance, and is digested on it
in the preparation of infusi
stance is exhausted by boilin
in the preparation of decoct
ebullition or infusion has cont
time, the heat is removed, ar
tion drawn off. The ingre
pressed to extract the rema
they are washed or 'sparged'
which expels it by displacem
to the usual practice in the n
a second quantity of water is
the first has been thoroughly
the infusion or decoction is re
and even a third time, or unti
are perfectly exhausted of thei
The liquor or liquors thus
allowed to repose for 15 or 20
purpose of depositing the san
and heavy matter that is me
with them, are carefully dec
sediment, and, after being
fine hair-sieve, or flannel ba
concentration. In some inst
this method proves insufficien
liquid clear. In such cases, tl
generally be rendered transpar
tion with a little white of eg
scum as it rises, straining the
flannel, as before; or the liquic
through a bag made of fine 'W
of 'tweeled cotton cloth' (Cant
of which should be soaked in
at least an hour before use. I
filters of linen or paper are
ployed; but as all media suf
render vegetable solutions tr
choke up, this filtration is obj
the length of time it occupies.
the aqueous infusion or decocti
repose for 24 hours, and ther
evaporated; but such a plan i
as, however smooth and glossy
pared may appear, their medici
lessened by the lengthened e
atmosphere.

When about one half of an a
has evaporated, it is often ad
repass it through a flannel
strainer, to remove the flocculi
form by the action of the heat
is especially necessary with veg
prepared without boiling, w

a smooth and sightly ex-

' **Solutions**:—The reduc-
o the proper consistence is
on. The mode in which
ries for different extracts.
e directs that, "unless
he evaporation should be
r as possible, in a broad,
in a water bath, until
is acquired for forming
iously with a spatula to-
operation." The Dublin
"all simple (aqueous) ex-
MPLICIORA), unless other-
be prepared by boiling the
times its weight of water,
ced to one half; the liquor
ed, and, after a short time
n, to be decanted, filtered,
steam or water bath, until
, and then finally inspis-
heat, with continual stir-
ence for forming pills be
ructions of the Edinburgh
, with the one important
of ordering the evapora-
l in a water bath saturated
ium.

r bath has the sanction of
, it is ill adapted for the
is here ordered to be ap-
iow evaporative power, the
re derived from its equable
astly overbalanced by the
e of the solution in a heated
of the atmosphere. It has
a vegetable extract so pre-
n quality to a similar one
vaporation in a shallow pan
or placed in a sand bath,
are is taken, and assiduous
l during the whole time of
eat. In practice, however,
fire is perfectly inadmissible,
t on the part of the operator
ad to the incineration of the
jections are obviated by the
h part of salt to the water of
ises its boiling-point to 218¾°
emperature of the contained
12°; the remaining 6° being
position of the substance of
essel.

e **scale**, the evaporation of
tions for extracts is usually
y wide, shallow, copper or
s, having steam-tight jackets
heated by steam 'playing'

terioration which vegetable
es undergo by exposure to the
high temperatures, has led to
of apparatus, by which they
ted without *contact with the*
a less degree of heat than is required for that purpose in open vessels. Such is the method, commonly called 'Barry's process,' in which the air is removed from certain air-tight refrigerators by the introduction of steam, which is then condensed by the application of cold, by which means a partial vacuum is obtained. Another process for attenuating the atmosphere over the surface of fluids during evaporation is by the action of an air-pump. This plan was introduced by Howard, and is commonly applied to the concentration of syrups in the sugar refineries. Extracts obtained by either of these methods are said to be prepared 'in vacuo,' and are found in practice to be immensely superior to the common extracts of the shops, and consequently require to be exhibited in proportionably small doses.

Obs. When water, acidulated with acetic acid, is employed in the preparation of extracts, the vegetable substances are usually macerated in it, in the cold, or the dilute acid is sprinkled over the bruised plant in the fresh or recent state, and the whole is then submitted to strong pressure, to expel the juice, which is strained and evaporated in the usual way, but preferably in a well-tinned or plated-copper pan.

Alcoholic and spirituous extracts are prepared by evaporating a filtered concentrated tincture of the ingredients in any suitable vessel, by which the volatilized spirit may be saved. In general, rectified spirit is used as the menstruum; but in some cases proof spirit is employed; and, in others, the substances are first digested in proof spirit, and afterwards in water, and the mixed tincture and infusion evaporated in the usual manner.

Ethereal extracts are obtained in a similar manner to alcoholic ones; but being merely prepared in small quantities at a time, the process may be conveniently performed in glass vessels. When it is required to boil either of the above fluids (alcoholic or ethereal), or any other volatile liquid on the ingredients, a vessel fitted with a long tube, or a Liebig's condenser reversed, as noticed under ether, may be used to prevent any loss of the menstruum.

The **inspissated vegetable juices** (juices, E.; succi, L.) of the British Pharmacopœia are obtained by expressing the juices from the fresh plants, and preserving them by the addition of spirit. "By thus preserving the juice of the plant its properties are not impaired by the action of the air during the time necessary to dry the leaf for tincture, nor by the action of both air and heat during the time necessary to evaporate the juice to the consistence of an extract."—Squire. The directions of the Edinburgh College for preparing their inspissated juices (succi spissati, L.) are—"Beat the fresh substance, and press it strongly through a canvas bag, *in order to* obtain the juice; which, *being put into* a wide, shallow vessel, and heated by means of boiling water saturated with sea-salt, is to be reduced to the consistence of honey. The mass, when cold, is to be put into glazed earthen vessels, and moistened with strong alcohol." By operating in this way a considerable portion of the activity of narcotic vegetables is lost. Some of their juices, as that of aconite, are impaired in so short a time as scarcely to compensate for the trouble of preparing them. This deterioration does not, however, take place in any remarkable degree, if the expressed juice from the recent vegetable be evaporated by exposing it in a thin stratum to a current of very dry air, as adopted by Mr. Squire. This may be managed by putting the juice into small, flat trays or dishes, placed on shelves in a suitably arranged apparatus, alternated with similar vessels of concentrated sulphuric acid; or by causing a current of very dry air, at the common temperature of the atmosphere, to pass over them. It has been shown that 10 grs. of extract, thus prepared, were more than equal to 20 grs. prepared *in vacuo*; and to more than 60 grs., and, in some cases, 90 grs., of those prepared by the common process of boiling down the juice to an extract.

The concluding portion of the process of extract-making, technically termed 'finishing-off,' requires the most scrupulous attention. As the evaporation advances, the heat should be lessened, and as soon as the extract acquires the consistence of thick treacle it should be removed altogether, and the remainder of fluid matter evaporated by the heat retained by the copper pan, the escape of vapour being promoted by assiduous and laborious stirring with a suitably shaped wooden spatula. This part of the process should be continued until a proper consistence is attained and the extract is nearly cold. When high-pressure steam or a chloride of calcium bath is employed, care must be taken to withdraw the heat before stirring the semi-liquid mass; as, if an extract having a temperature of about the boiling-point of water, or even a few degrees below it, is agitated, it becomes full of bubbles, and appears rough and puffy, and this appearance cannot be removed by subsequent stirring, or by any method but redissolving it in water and re-evaporation. This is especially the case with the extracts of sarsaparilla (simple and compound), gentian, liquorice, and most others of a similar class. A good laboratory man knows from experience the proper time for the removal of the heat, but unpractised persons often fail in this particular. In such cases, should the heat retained by the evaporating pan, and by the extract, prove insufficient to complete the process, a little more may be cautiously applied. Without assiduous and laborious stirring in the way described, a very smooth and glossy extract cannot be produced. To promote this artificial appearance, some persons add 3% or 4% each of
olive oil and gum arabic, dis
with about 1% or 2% of spirit o

The consistence of the ordi
the shops is the same as th
and confections, and is describ
as equal to that "of thick h
structions of the Ph. L. and
the mass "until it acquires a c
for making pills," except in
Ext. Colocynth. Comp., &c.),
and, indeed, would be found
practice. Extracts evaporate
sistence are commonly term
tracts;' and when evaporate
are quite dry, and brittle whe
called 'hard extracts' (EXTRA

Pres. Extracts should be
soon as taken from the pan,
carefully and securely tied ov
should be 'stored' in a dry
London College orders "a s
rectified spirit to be sprinkl
softer extracts, to prevent
mouldy." A better way is t
spirit, holding in solution a fe
cloves, or a still less quantity
should be added to them the
removing them from the evap
when they are nearly cold.
is effected by moistening th
bladder (used to tie them o
drops of oil of cloves or cre
tracts should be kept in bladd
placed in stone pots, and we
With care, extracts prepared
getable substances may be
months, or from season to se
from dry ingredients, or such
clined to spoil, for perhaps d
but beyond these periods thei
be relied on, and they should
discarded, if remaining unuse

Pur., &c. The quality of a
be ascertained by mere inspe
readily discovered by chemical
ledge of these facts has ind
nary and fraudulent manufa
damaged and inferior drugs i
tion, alike regardless of the
patient and the credit of the
common practice with some m
not only to pick out the least e
of every drug for the prep
extracts, but the most infe
damaged and worthless portio
inferior article. The producti
bright, and glossy extract is al
attempted by these individua
is sought after by the mass of
mistake the simulation of th
signs of good quality for its
It is a fact, which we can verif
experience in the laboratory,
of practical observation on t
extracts faithfully prepared
terials do not possess the sig

f those commonly vended by the
ggists. On comparing the ex-
sed by different metropolitan
we found that those which have
markably bright and glossy ap-
s been uniformly inferior, and
rly inert; whilst others, with a
ing appearance, have been gene-
quality. These facts are well es-
ference to the extracts of those
stitutions that are remarkable
or quality of their preparations,
aring them with the common
e shops supplied by the whole-

tract should be—1. Free from
olly soluble in 20 parts of the
mployed in its preparation, form-
lear solution.—2. It should have
xture and colour, and be of a
mace.—3. If a narcotic or active
ty be exhibited in proper doses,
watched. Its activity may also
any small animal.—4. An assay
nate vegetable principle (alkaloid,
l in the plant from which it has
d may be made. The extracts
n the expressed juices of plants,
ing off the coagulated albumen,
, exceptions to the first test. Un-
hese tests are not always easily
nd the last two are inapplicable
cts that exercise no very marked
action, unless when taken in re-
long continued. This want of a
of accurately testing the qualities
s enabled the fraudulent manu-
ll inferior articles with impunity,
thout the least fear or danger of

, an extract more than six months
only half the activity of a similar
made. When more than twelve
they should be rejected as worth-
stock renewed.

The extracts of the shops are
knowledged to be the most vary-
ect, and uncertain class of medi-
ging to modern pharmacy. They
used in the same cases as the
which they are prepared, but in
s.

ng remarks. In the preparation of
s great desiderata to be aimed at
t the menstrua and the methods of
ng to the peculiar characteristics of
constituents of the vegetable sub-
rated on. The pharmaceutist should
r in mind that a perfect extract
a concentrated, solid mass, repre-
s near as possible, in medicinal effi-
aterials from which it has been pre-
l capable of being redissolved, so as
lution closely resembling *that from
hey have been derived. An extract pos-
l strength to the whole mass of the*
ingredients from which it has been prepared is almost next to an impossibility, however desirable such a degree of perfection may be. The medicinal properties of all solutions of vegetable matter are injured by being reduced to the solid state; and this deterioration, more or less, takes place, whether the solvent be water, acetic acid, proof spirit, or alcohol. The volatile portions (the essential oils, the aroma, &c.) are nearly or wholly dissipated; and though these do not always form the principal or active ingredients of the vegetables from which extracts are prepared, yet they generally exercise a modifying and controlling influence over the other ingredients, which considerably alters their therapeutical action. The loss of aroma may often be a trifling deficiency, but in the extracts of aconite, henbane, hemlock, belladonna, and other narcotic plants, this is not the case. In these cases it is well known that the inert preparations are wholly deficient of the odour of the recent plant, and that in proportion as the odour is developed, so is their activity preserved. The powerful smell of the recently expressed juice of hemlock, with the scarcely perceptible odour of the extract (EXTRACTUM CONII, Ph. L.), offers an excellent example of this fact. The dose of the one often reaches 20 or 30 gr., whilst that of the other seldom exceeds 5 or 10 drops, or a portion equivalent in dry ingredients to considerably less than ½ gr.

When extracts are ordered in prescriptions, those of the 'Pharmacopœia' should be alone employed by the dispenser, as the substitution of others for them would not only be violating faith with the prescriber, but might also produce consequences alike injurious to the dispenser and the patient. Many medical gentlemen prefer extracts prepared by particular processes or persons, but such intention is always indicated in their prescriptions.

Extract of Ac'onite. *Syn.* EXTRACT OF WOLFSBANE, E. OF MONKSHOOD, INSPISSATED JUICE OF ACONITE; EXTRACTUM ACONITI (B. P., Ph. L. E. & U. S.), SUCCUS SPISSATUS ACONITI (Ph. D. 1826), L. *Prep.* 1. (B. P.) Take 112 lbs. of the fresh leaves and flowering tops, bruise them, press out the juice, heat it gradually to 130° F., and separate the green matter by a calico filter. Heat the strained liquor to 200° F. to coagulate albumen, and again filter. Evaporate the filtrate by a water bath to the consistence of a thin syrup; then add to it the green colouring matter previously separated, and stirring the whole together assiduously, evaporate at a temperature not exceeding 140° F. to a pill consistence.—*Dose.* 1 to 2 grs.

2. (Ph. L.) Take of fresh leaves of aconite, 1 lb.; bruise them in a stone mortar, express the juice, and evaporate it, unstrained, to a proper consistence. The formulæ of the Ph. *D. & U. S. are similar.*

3. (Ph. E.) Beat the fresh leaves of aconite *to a pulp, and express* the juice, then subject the residuum to percolation with rectified spirit until the latter passes through without being materially coloured; unite the expressed juice and the percolated tincture, filter, distil off the spirit, and evaporate in a vapour or a water bath to a proper consistence. Stronger than the preceding.

Obs. A variable and uncertain preparation. Numbness and tingling follow its application to the limbs or tongue when it is of good quality.—*Product.* 1 cwt. of fresh leaves yield between 5 lbs. and 6 lbs. of extract.—*Prop.* Anodyne, sudorific, and narcotic; very poisonous.—*Dose.* ½ gr. to 2 grs., made into a pill with liquorice powder; once or twice a day, in neuralgic pains, chronic rheumatism, glandular swellings, &c., gradually and cautiously increased to 5 or 6 grs.

4. (Alcoholic; E. A. ALCOHOLICUM, L.)—*a.* (P. Cod.) Aconite (in coarse powder), 1 lb.; proof spirit, 3½ lbs. (say 2½ pints); proceed by the method of displacement, and when all the spirit has penetrated the powdered mass, keep this covered with distilled water, until the liquid begins to cause a precipitate in falling into that which has previously passed through; next distil the spirit from the tincture, and evaporate the residuum to the proper consistence.

b. (Ph. U. S.) Aconite 1 lb.; spirit sp. gr. ·935 (=13 u. p.), 1 quart, or q. s.; as last.

c. (Ph. Baden.) From the tincture prepared with rectified spirit, and by either maceration or displacement. Stronger than the last two.

d. (Ph. Bor.) The juice is expressed from the fresh herb, which is then sprinkled with about ¼ of its weight of water, and again pressed; the mixed and strained liquid is evaporated in a vapour bath at 122° to 140° Fahr., to about one half; to this, as soon as cold, an equal weight of spirit (sp. gr. ·900) is added, and after frequent agitation for 24 hours, the whole is filtered, with pressure; the marc is treated with fresh spirit (equal to about 1-4th that first used) and again pressed; the mixed liquors are next filtered, and are, lastly, evaporated, as before, to the proper consistence.

Obs. Resembles the simple extract, but is much more powerful. It has been exhibited internally in the form of pills, and used externally, combined with ointment or spread on simple plaster.—*Dose.* $\frac{1}{12}$ to ⅛ gr. every three hours.

5. (Ammoniated; E. A. AMMONIATUM, L.—Dr. Turnbull.) Extract of aconite, 1 dr.; liquor of ammonia (strongest), 10 or 12 drops; mix.

6. (Dried; E. A. SICCUM, L.—P. Cod.) The expressed juice, strained through a sieve or coarse linen, is at once, without depuration, exposed in earthen dishes, in layers of about 2 lines deep, in a stove or current of dry air, to a temperature ranging between 95° and 104° Fahr., until reduced to dryn extract is to be packed in bottl

7. (Saccharated; E. A. SAC From extract of aconite (Ph. Ba of milk (in powder), 1 oz.; mix mass in a warm place, adding q. s. to make the whole equal in of the extract used (4 oz.). An paration, which keeps well. Th COTIC EXTRACTS, as those of HEMLOCK, HENBANE, &c., are to a similar manner. See ACONITE,

Extract of Aconite Root. *Syn.* ACONITI RADICIS ALCOHOLICUM, (Dr. Fleming; Dr. Turnbull.) F of the root made with rectified said to be 12 times as strong as th the leaves.

Extract of Ag'aric. *Syn.* EXT RICI, L. *Prep.* (P. Cod.) From of white agaric (*Polyporus* pared with cold water. Purgative to 4 grs.

Extract of Alcorno'co. *Syn.* ALCORNOCÆ, L. *Prep.* From a alcornoco bark (South American). and tonic.—*Dose.* 5 to 20 grs.; &c.

Extract of Al'oes. *Syn.* PURI WASHED A.; EXTRACTUM ALOËS BA (B. P.), EXTRACTUM ALOËS (Ph. AQUOSUM (Ph. D.), L. *Prep.* 1. Barbadoes aloes, in small pieces, 1 with 1 gal. of boiling water for 12 the clear liquid evaporated.—*Dose.* B. P. 2 to 6 grs.

2. (B. P.) Socotrine aloes, 1 with 1 gal. of boiling water for 12 the clear liquid evaporated to dryne

3. (Ph. D.) Aloes (hepatic), 4 1 quart; boil till dissolved; when the clear liquid, and evaporate as be

4. (Ph. Bor. 1847.) By macera dered aloes in cold water for 48 frequent agitation, and then evap a water bath at a temperature not 150° to 165° Fahr., until a pilular is attained.

Obs. The second is the form adopted in the laboratory. When the juice of borage, bugloss, &c., it old 'ALOES INSUCCATA.'—*Dose.* 5 to See ALOES and EXTRACT OF BA ALOES.

Extract of Anem'one. See EXTR PASQUE FLOWER.

Extract of Angel'ica. *Syn.* EXTR ANGELICÆ, L. *Prep.* 1. (Ph. Baden.) a tincture of the root, prepared with sp. gr. ·944 (=21½ u. p.).

2. (Ph. Bor.) Angelica root and spirit, of each, 2 parts; water, 9 parts; strain, and evaporate. Inferior to the ceding.

3. (Dr. Moir.) Angelica root, 2 lbs.; tified spirit, 1 gal.; make a tincture;

pirit, 1 gal., and repeat the
ie two tinctures separately,
he spirit, and evaporate.
iic, and tonic.—*Dose.* 10
st is the most balsamic and

les. *Syn.* CHALYBEATED E.
 FERRI POMATUM, L. *Prep.*
apples (unripe), 6 lbs.; peel
them to a pulp; add iron
ls), 1 lb.; digest in a vapour
week, express, strain, decant,
a porcelain vessel, with con-
the consistence of a soft ex-
e residuum in water, 4 parts,
rate as before.—*Dose.* 5 to
lybeate tonic. The formula
is nearly similar.

r'nica. *Syn.* EXTRACT OF
; EXTRACTUM ARNICÆ FLO-
1. (P. Cod.) From the dried
IOLIC EXTRACT OF ACONITE—

, 1837.) From a tincture of
pared with rectified spirit, 8
, 5 parts.—*Dose.* 2 to 6 grs.;
n various diseases accompanied
deficient nervous sensibility,
ies, diarrhœa, amenorrhœa, dy-

nica-Root. *Syn.* EXTRACT OF
RACTUM ARNICÆ RADICIS, L.
Baden.) As EXTRACT OF ANGE-
ca.
a.) From tincture of the root,
o. 2 (*above*). The form of the
ex is nearly similar.—*Dose, &c.*

Art'ichoke. *Syn.* EXTRACTUM
Prep. From the fresh leaves of
as EXTRACT OF ACONITE—Ph. L.
6 grs., twice or thrice daily; in
e.

Aspar'agus. *Syn.* EXTRACTUM
Prep. 1. (Soubeiran.) From
juice of the shoots, clarified and
a gentle heat.
e juice of the roots, as No. 1.
etic.—*Dose.* 15 grs. to ½ dr., or

Bael. *Syn.* EXTRACTUM BELÆ
. B. P. Bael, 1; distilled water,
spirit, ¼; macerate for 12 hours
water, pour off the liquid, repeat
a twice for 1 hour; press, filter,
te to 1, including the spirit. A
is equal to a solid ounce.—*Dose.*

Bark. See EXTRACT OF CIN-

Belladon'na. *Syn.* EXTRACT OF
HSHADE, INSPISSATED JUICE OF
; EXTRACTUM BELLADONNÆ (B.
& D.), SUCCUS SPISSATUS BELLA-
Prep. 1. (B. P.) Take 112 *lbs.*
w and tender branches, bruise in a stone mortar or other suitable apparatus, and press out the juice, heat it gradually to 130° F., separate the green colouring matter by a calico filter, heat the strained liquor to 200° F. to coagulate the albumen, and again filter; evaporate the filtrate by a water bath to the consistence of a thin syrup, then add to it the green colouring matter previously separated, and, stirring the whole together assiduously, continue the evaporation at a temperature not exceeding 140°, until the extract is of a suitable consistence for forming pills.—*Dose.* ¼ to ½ gr., gradually increased to 1 or 2 grs.

2. (Ph. E.) Express the juice from the bruised fresh plant, sprinkle the 'marc' with water, and again apply pressure; mix the expressed liquids, filter them, and evaporate the filtered liquor in a vapour bath to the consistence of an extract.

3. (Ph. D.) From the leaves, collected when the plant begins to flower. The expressed juice is allowed to stand for 24 hours, and the clear portion is decanted; the sediment is placed on a calico filter, washed with an equal bulk of cold water, and the filtrate mixed with the expressed juice. The mixed liquid is next heated in a water bath, to coagulate its albumen, and after being skimmed, and filtered through flannel whilst hot, the washed sediment is added, and the whole evaporated, as before.

4. (Ph. U. S.) The expressed juice is heated to the boiling-point, filtered and evaporated (see *below*).

Obs. The P. Cod. directs this extract to be made by two different formulæ. The product of the one resembles that of the Ph. L.; that of the other, that of the Ph. E. That of the Ph. L., from retaining the fecula, is the weakest preparation. *Dose.*—½ gr. to 1 gr., gradually increased to 3 or 4 grs.; as an anodyne in neuralgia, tic-douloureux, &c.; as an antispasmodic to relieve rigidity and spasms, in various affections of the uterus, rectum, urethra, bladder, &c., and in hooping-cough; in various maladies of the eyes; and as a resolvent and discutient in several glandular diseases. It has been highly recommended as a preservative against scarlet fever. It is most frequently employed externally, under the form of a plaster, ointment, or lotion. It is poisonous.

5. (Alcoholic; E. B. ALCOHOLICUM, L.)—*a.* (P. Cod.) As ALCOHOLIC EXTRACT OF ACONITE —P. Cod.

b. (Ph. U. S.) As the last (nearly), using spirit of ·935 (= about 13 u. p.).

c. (Moir.) The expressed juice is coagulated by heat, cautiously applied, and filtered; the filtrate is reduced to the consistence of a syrup, and mixed with an equal volume of nearly anhydrous alcohol (say of 90%); the clear portion is lastly evaporated, as before.

Obs. The above is much more powerful than the common extract, and is chiefly used in external applications. See BELLADONNA, and *below.*

Extract of Belladonna Ber'ries. *Syn.* EXTRACTUM BACCARUM BELLADONNÆ, L. *Prep.* (P. Cod.) From the expressed juice of the berries, evaporated to the consistence of thick honey.—*Dose.* 1 to 5 grs.

Extract of Bis'tort. *Syn.* EXTRACTUM BISTORTÆ, L. *Prep.* 1. (P. Cod.) From the dried root of bistort or snake-weed (*Polygonum Bistorta*), by percolation with temperate distilled water.

2. From the infusion made with boiling water, or from the decoction. Astringent and tonic.—*Dose.* 10 grs. to ½ dr.

Extract of Bit'ter-sweet. *Syn.* EXTRACT OF WOODY NIGHTSHADE; EXTRACTUM DULCAMARÆ, L. *Prep.* 1. From the decoction of the stalks.

2. (Ph. U. S.) From the dried stalks, by percolation with temperate water. Diaphoretic, diuretic, and narcotic.—*Dose.* 3 to 6 grs.; in chronic asthma, rheumatism, and chest diseases; and particularly in chronic skin diseases.

Extract, Black. See EXTRACT OF COCCULUS.

Extract of Black Pepper. See EXTRACT OF PEPPER.

Extract of Bor'age. *Syn.* EXTRACTUM BORAGINIS, L. *Prep.* 1. (P. Cod.) From the dried herb (*Borago officinalis*).

2. (Ph. Lusit.) From the clarified juice of the fresh plant. Exhilarating, restorative, and pectoral.—*Dose.* 10 to 30 grs., or more.

Extract of Box. *Syn.* EXTRACTUM BUXI, E. CORTICIS B., L. *Prep.* (P. Cod.) From the tincture of the root bark, prepared (with proof spirit) by displacement, as EXTRACT OF ACONITE—P. Cod.

Extract of Broom. *Syn.* EXTRACT OF BROOM TOPS; EXTRACTUM SCOPARII, E. SPARTII SCOPARII, L. From decoction of broom tops. Diuretic and cathartic; and, occasionally, emetic.—*Dose.* 20 grs. to 1 dr.; in dropsy, &c. It is now seldom used.

Extract of Bry'ony. *Syn.* EXTRACTUM BRYONIÆ, E. B. ALBÆ, E. RADICIS B. A., L. *Prep.* From the infusion or decoction of the root of white bryony (*Bryonia dioica*). Purgative, diuretic, and emmenagogue.—*Dose.* 10 grs. to ½ dr. It was once a favourite remedy in asthma, dropsy, epilepsy, &c.

Extract of Bu'chu. *Syn.* EXTRACTUM BUCHU, E. DIOSMÆ, L. *Prep.* 1. From buchu leaves, as the last.

2. (Ethereo-alcoholic; E. B. ÆTHERO-ALCOHOLICUM, L.—W. Procter.) Buchu (in coarse powder), 1 lb.; ether, 4 fl. oz.; alcohol (rectified spirit), 12 fl. oz.; percolate without digestion, adding dilute alcohol until a pint of ethereo-alcoholic tincture is obtained, and suffer this to evaporate spontaneously; treat the residue in the displacer with dilute alcohol, till 2 pints are obtained; evaporate to a syrup, add the product of the first tincture, mix, and complete the evaporation.—*Dose.* 5 to 10 grs.; in diseases of the urinary organs, &c.

3. (Fluid; E. B. FLUIDUM, L.—W Buchu leaves, 8 oz.; rectified spi for a tincture by displacement, a until 12 fl. oz. have passed throug to evaporate spontaneously until half; next digest the mass in th with cold water, 1 pint, for 12 h pint, and evaporate this to 10 fl add the 6 fl. oz. of residual tinc together, and in a few days filte the clear portion.—*Dose.* 1 to 2 See DIOSMA.

Extract of Buck'bean. *Syn.* E MENYANTHIS, L. *Prep.* 1. (P. C the expressed juice of the fresh p

2. (Ph. Bor.) From the infusion boiling water. Bitter, tonic, and *Dose.* 5 to 10 grs. In large doses tive, cathartic, and even emetic.

Extract of Buck'thorn. *Syn.* E RHAMNI, E. BACCARUM R., L. the filtered expressed juice of berries. Some persons allow it fir into a state of fermentation; but the of the product is thereby greatly Hydragogue and purgative.—*Dose.* 1 dr., or more.

Extract of Bur'dock. *Syn.* EX BARDANÆ, L, *Prep.* 1. From the de burdock root.

2. (P. Cod.) As EXTRACT OF P. Cod. In gout, rheumatism, skin &c.—*Dose.* 10 grs. to 1 dr. Sir Ro pole praised burdock-root as a gout and others have considered it an exce stitute for sarsaparilla. (Lindley.)

Extract of Butter-nut. *Syn.* EX JUGLANDIS, L. *Prep.* (Ph. U. S.) F inner bark of the root of the butter white walnut (*Juglanda alba*), as EXTR BITTER SWEET—Ph. U. S. A mild, ye cious aperient and vermifuge.—*Dose.* laxative, 5 to 10 grs.; as a purgative, 30 grs.

Extract of Calabar Bean. *Syn.* EXTR PHYSOSTIGMATIS. (B. P.) Calabar b coarse powder, 1; rectified spirit, 5; m the bean for 48 hours in one fourth o spirit in a closed vessel, agitating occasio then transfer to a percolator, and whe fluid ceases to pass add the remainder o spirit, so that it may slowly penetrate th the powder; subject the residue of the b pressure, adding the pressed liquid to the duct of the percolation; distil off the and evaporate what is left to the cons of a soft extract by a water bath.— $\frac{1}{16}$ to ¼ gr.

Extract of Calum'ba. *Syn.* EXTRACTU LUMBÆ, E. RADICIS C., L. *Prep.* 1. (Calumba cut small, 1; water, 6; macer half the water for 12 hours, strain, and macerate again with the remaining strain, and press; mix and filter the li and evaporate with the heat of a water to pill consistency.—Dose. 2 to 10 grs.

-Ph. Bor.) Nearly as No. 3
g stronger spirit; the evapo-
nducted at a heat not above
it acquires the consistence of
:h, after being rendered quite
ntle heat, is to be reduced to
t should have a brownish-
d give a turbid solution with
, to 12 grs. They are all tonic

s—P. Cod.) As EXTRACT OF
. Baden. orders spirit of ·944
se. 5 to 15 grs.
nnabis Indicæ. See EXTRACT
P.
nthar'ides. *Syn.* EXTRACT OF
; EXTRACTUM CANTHARIDES,
Prep. 1. (P. Cod.) From the
RACT OF BOX.
n.) From a tincture prepared
he sp. gr. ·923 (about 2 u. p.).
E. C. ACETICUM, L.) From a
red with acetic acid sp. gr.

; E. C. ÆTHEREUM, L.) From
ncture.
ther, acid, and spirit distilled
e must be either thrown away
ke fresh extract, as it is highly
hey are all for external use
ld have the consistence of soft

Car'damoms. *Syn.* ETHEREAL
RACTUM CARDAMOMI ÆTHEREUM,
(W. Procter.) By spontaneous
of the ethereal tincture. It con-
volatile and fixed oils of the
used to aromatise pills, powders,

Ca'rob Beans. *Syn.* EXTRACTUM
L. *Prep.* From the decoction
(CAROB, or ALGAROBA BEANS) of
ia siliqua,' or 'St. John's bread
LGAROBA.
Caroli'na Pink. See EXTRACT OF

Car'rot. *Syn.* EXTRACTUM CA-
ADICIS C., L. *Prep.* (Swediaur.)
rified expressed juice, evaporated
stence of honey. Recommended
tion to ulcerated cancers.
Cascaril'la. *Syn.* EXTRACTUM
, E. CORTICIS C., L. *Prep.* 1.
From the alcoholic (rectified
re.
aden.) As the last, but using
sp. gr. ·944.
. 1788.) As EXTRACT OF JALAP

extract is tonic, aromatic, and
-*Dose.* 5 to 15 grs., or more, 2 or
ay. 28 lbs. of bark yield about
tract.
Cas'sia. *Syn.* EXTRACTUM CAS-
CASSIA PULP.
Cat'echu. *Syn.* EXTRACTUM

CATECHU, L. *Prep.* 1. From decoction of catechu.

2. (P. Cod.) From the infusion in boiling water. Astringent and tonic.—*Dose.* 5 to 25 grs. See CATECHU.

Extract of Cel'andine. *Syn.* EXTRACTUM CHELIDONII, L. *Prep.* 1. (Ph. Bor.) From the herb (*Chelidonium majus*), as ALCOHOLIC EXTRACT OF ACONITE—Ph. Bor.—*Dose.* 3 to 10 grs.

2. (Van Mons.) From the expressed juice, coagulated by heat, filtered, and evaporated, towards the end adding the coagulum.—*Dose.* 5 to 15 grs., or more. *Used* as a drastic hydragogue in dropsies; and in scrofula, &c.

Extract of Cen'taury. *Syn.* EXTRACTUM CENTAURII, L. Extracts under this name are prepared from 'American centaury' (*Sabbatia angularis*), and common centaury' (*Erythræa Centaurium*). *Prep.* 1. By evaporating the decoction, or the infusion made with hot water. The dose and properties resemble those of extract of gentian.

2. (Alcoholic; E. C. ALCOHOLICUM, L.) As EXTRACT OF BOX (see *above*).

Extract of Cevadil'la. *Syn.* ALCOHOLIC EXTRACT OF SABADILLA; EXTRACTUM SABADILLÆ, L. *Prep.* (Dr. Turnbull.) From tincture of cevadilla seeds, made with rectified spirit. Employed by Dr. Turnbull as a remedy in painful rheumatic and neuralgic affections, and, generally, as a substitute for VERATRIA.—*Dose.* $\frac{1}{16}$ to $\frac{1}{8}$ gr. It is extremely poisonous.

Extract of Cham'omile. *Syn.* EXTRACTUM ANTHEMIDIS (Ph. E.), E. A. NOBILIS, L. *Prep.* By evaporating the decoction of the flowers to the proper consistence.

Obs. This extract contains only the bitter portion of the chamomile, the aromatic volatile oil being dissipated during the evaporation. It is usually prepared from old flowers that have lost their smell and colour, and are thus rendered unsaleable. The extract of chamomile that smells strongly of the flowers, frequently vended by the druggists, is prepared by adding 1 dr. of the essential oil of chamomile to every pound of extract, when nearly cold, and just before removing it from the evaporating pan. This addition, unlike many which are made in the laboratory, vastly increases the medicinal virtues of this article. The mass of extract of chamomile met with in the shops is nothing but extract of gentian scented with a little oil of chamomile. 1 cwt. of chamomiles yields about 48 lbs. of extract.

Extract of chamomile is bitter, tonic, and stomachic.—*Dose.* 10 to 20 grs., made into a pill, either alone or combined with a little rhubarb and ginger. See PILLS, &c.

Extract of Chenopo''dium. *Syn.* EXTRACT OF STINKING GOOSE-FOOT; EXTRACTUM CHENOPODII, L. *Prep.* 1. From the stinking *orache or goose-foot* (*Chenopodium olidum*), as EXTRACT OF ACONITE.—Ph. L.

2. (Mr. Houlton.) From the expressed juice by spontaneous evaporation. A better plan is to expose it to heated air. Antihysteric, emmenagogue, and vermifuge.—*Dose.* 5 to 20 grs.

Extract of Cincho'na. *Syn.* EXTRACT OF BARK. Three simple extracts, prepared respectively from YELLOW, PALE, and RED CINCHONA, are given in Ph. L.:—*Prep.* 1. (From CALISAYA or YELLOW BARK:—EXTRACT OF CINCHONA, E. OF YELLOW C., E. OF HEART-LEAVED C.; EXTRACTUM CINCHONÆ, L.) — *a.* EXTRACTUM CINCHONÆ FLAVÆ LIQUIDUM (B. P.). Yellow cinchona bark in coarse powder, 16; distilled water, a sufficiency; rectified spirit, 1; macerate the bark in 40 of water for twenty-four hours, then pack in a percolator, and add water until 240 have passed through, or until the bark is exhausted; evaporate the liquor to 20, at a temperature not exceeding 160°; then filter, and continue the evaporation to 3, or until the sp. gr. of the liquid is 1·200; when cold, add the spirit gradually, constantly stirring. Sp. gr. 1·100.—*Dose.* 10 to 30 minims.

b. (Ph. L.) Yellow cinchona (coarsely bruised), 3 lbs.; distilled water (temperate), 4 pints; macerate for 24 hours (constantly stirring), and strain through linen; what remains, again macerate in water, 1 quart, for 24 hours, and strain; evaporate the mixed liquids to a proper consistence.

Obs. The aqueous extracts of cinchona bark possess little medicinal virtue, owing to the insolubility of the alkaloids (quinine, cinchonine, &c.) in water, and also from the rapid oxidation of their extractive matter, when exposed in solution to the joint action of heat and atmospheric oxygen.—*Dose.* 5 grs. to ½ dr., in mixtures, faintly acidulated with sulphuric acid. Cinchona bark yields from 24% to 30% of aqueous extract.

2. (From PALE BARK:—EXTRACT OF PALE CINCHONA, E. OF PALE BARK, E. OF LANCE-LEAVED B.; EXTRACTUM CINCHONÆ PALLIDÆ, L.)—*a.* (Ph. L.) From pale bark, as EXTRACT OF CINCHONA—Ph. L. (*above*).

b. (Ph. L. 1836.) From the decoction.

Obs. This forms the EXTRACT OF BARK of the shops. The red and yellow cinchona barks are scarcely ever used for making extracts. Their richness in quinine leads to their almost exclusive employment for the manufacture of that alkaloid, by which their value is greatly enhanced. As far as our knowledge extends, no other extract of bark than this is either employed or asked for.

3. (From RED BARK:—EXTRACT OF RED CINCHONA, E. OF RED BARK, E. OF OBLONG-LEAVED B.; EXTRACTUM CINCHONÆ RUBRÆ, L.)—*a.* (Ph. L.) From red bark, as EXTRACT OF CINCHONA—Ph. L. (*above*).

b. (Ph. L. 1836.) From the decoction.

Obs. These extracts are ordered to be kept in two states, the one (SOFT EXTRACT OF CINCHONA; EXTRACTUM CINCHONÆ MOLLE) for making pills, &c.; the other (HARD EXTRACT OF CINCHONA; EXTRACTUM CINCHO
for powdering.—The *dose*, &c., of
are the same.

4. (Dry:—ESSENTIAL SALT OF
TRACTUM CINCHONÆ SICCUM,
Cod.) From an aqueous infusion
(prepared by displacement with
temperature not above 77° Fahr.)
to the consistence of a thick syr
spread thinly and uniformly on
dishes, or sheets of glass, and dri
by a very gentle heat. It is sc
the plates with a knife, and pres
closed phials. Prior to spreadin
the plates, about 4% or 5% of thick
commonly added.

b. (Ph. Bor.) As the above (
c. (Ph. Hann. 1831.) Similar t
but the liquid, when it acquires th
of treacle, is diluted with wate
evaporated to a like consistenc
dilution and evaporation is repea
the addition of water, it forms a c
—*Dose.* 5 to 25 grs. The produ
formula is nearly inert, and that
possesses little activity.

5. (Fluid:—EXTRACTUM CINC
DUM, L.)—*a.* See LIQUOR OF CIN
b. (Dr. Neligan.) From yel
FLUID EXTRACT OF BUCHU.

6. (Resinous:—ALCOHOLIC
BARK; EXTRACTUM CINCHONÆ A
E. CINCHONÆ, L.)—*a.* (Ph. E.)
variety of cinchona bark (in po
proof spirit, 24 fl. oz.; prepare a
displacement, distil off most of t
evaporate the residuum to the c
an extract. This is the only EXT
CHONÆ of the Edinburgh College.

b. (Ph. U. S.) Peruvian bark, 1
spirit, 4 pints; make 4 pints of
displacement; add water to the
percolator, digest, and obtain 6
fusion; distil off the spirit from
and evaporate the infusion to th
of syrup, then mix the two, and
evaporation. More active than
extract.—*Dose.* 5 to 20 grs.

c. (Ellis.) Yellow bark, 2 lbs.;
acid, 4 fl. drs.; water, 1 gal.; bo
repeat the decoction with fres
acid; mix the decoctions, filter,
with fresh-slaked lime, 2½ oz.; fil
dry the residuum, and exhaust
alcohol, q. s.; lastly, evaporate
tincture to a pilular consistence.
5 grs. Some persons have pr
this 'ESSENTIAL SALT OF BARK.'

7. (Vinous:—EXTRACTUM C
NOSUM, L.—Ph. Hesse.) Peru
powder), 1 part; white wine
parts; digest 3 days, express
evaporate.

Extract of Coc'culus. *Syn.*
COCCULUS INDICUS, BLACK EXTR
(Brewer's), BEER STRENGTHENE

I COCCULI, E. C. INDICI,
cculus indicus, by decoction.
tates—one having the con-
reacle; the other, that of a
The first is 'put up' in
is made into ¼-lb. rolls, like
ll-chocolate. It is narcotic
l is employed by fraudulent
cans to give a false strength
. See COCCULUS INDICUS,

hicum. *Syn.* EXTRACT OF
s, E. OF THE CORMS OF COL-
ACTUM COLCHICI (B. P.).
The expressed juice of fresh
, cleared of deposit, boiled,
vaporated to a proper con-
emperature of 160° Fahr.—
.
.) From the decoction of the
rod. 50% to 55%.
xtract is given in the usual
olchicum is employed.—*Dose.*
every third or fourth hour.
A favorite remedy of Dr. Hue,
omew's Hospital, in the early
rheumatism. The dose is 1 gr.
a." (Pereira.)
ACETIC EXTRACT OF MEADOW
TRACTUM COLCHICI ACETICUM
. P.) Crushed fresh corms, pre-
19; acetic acid, 1; stir together,
d strain through flannel, and
soft extract.—*Dose.* 1 to 2 grs.
weight of liquorice powder.
le.) Dried corms, 14 lbs.; acetic
eous), 6 pints; distilled water,
gest for 14 days, express, filter,
. Product, 2½ to 3 lbs.
above extracts are generally pre-
he dried corms, and hence the
a and inferior quality of those
t with. They also possess less
the pharmacopœial preparations.
get dry and crumbly, and, un-
irit and oil of cloves are added,
keep a week in warm weather
ning mouldy.—*Dose.* 1 to 3 grs.,
imes a day. It is much stronger
son extract, and contains the ace-
ine. Sir C. Scudamore prefers the
prepared by the formula *b* (*above*).
ic; EXTRACTUM COLCHICI ALCO-
-P. Cod.). As EXTRACT OF BOX.
han even the acetic extract. All
as of colchicum are poisonous in

Colocynth. *Syn.* EXTRACT OF
; EXTRACTUM COLOCYNTHIDIS
.), E. C. SIMPLEX, E. C. MOLLE,
(Ph. L.) From colocynth pulp
s and the seeds removed), by
tion in cold water, for 36 hours,
sing it with the hands, and
ughly pressing out the liquor,
, *strained before evaporating it.*

2. (Ph. E.) From the decoction. This is the plan adopted at Apothecaries' Hall, and in the laboratory generally. Many houses do not even remove the seeds.

Obs. This extract rapidly gets hard, crumbly, and mouldy, by keeping. For the remedy, see observations on EXTRACT OF COLCHICUM, *above.*—*Dose.* 5 grs. to 20 grs.; as a cathartic. Colocynth pulp yields about 65% of extract.

3. (Alcoholic; EXTRACTUM COLOCYNTHIDIS ALCOHOLICUM, L.)—*a.* (Ph. Baden.) As EXTRACT OF ANGELICA—Ph. Bad.

b. (P. Cod.) From a tincture prepared with proof spirit. Much more active than the simple extract.—*Dose.* 2 to 7 grs.

4. (Dry; EXTRACTUM COLOCYNTHIDIS SICCUM, L.—Ph. Bor.) As the last, but using spirit of the sp. gr. ·900 (about 16 o. p.), digesting at a tepid heat, evaporating to dryness, and powdering.—*Dose.* 1 to 6 grs.

Extract of Colocynth (Compound). *Syn.* COMPOUND EXTRACT OF BITTER APPLE, CATHARTIC EXTRACT; EXTRACTUM CATHARTICUM, E. COLOCYNTHIDIS COMPOSITUM, B. P. *Prep.* 1. (B. P.) Colocynth free from seeds, 6; extract of Socotrine aloes, 12; scammony, or resin of scammony in powder, 4; hard soap in powder, 3; cardamoms freed from capsules in fine powder, 1; proof spirit, 160. Macerate the colocynth in the spirit for four days, press out the tincture, distil off the spirit, and add to it the extract of aloes, the soap, and the scammony; then evaporate the residue by a water bath to a pilular consistence, adding the cardamoms towards the end of the process.—*Dose.* 2 to 5 grs., with 2 or 3 grs. of extract of hyoscyamus to prevent griping.

2. (Ph. L. 1836.) Colocynth pulp (sliced, without the seeds), 6 oz., proof spirit, 1 gal.; digest with a gentle heat for 4 days, express, strain, and add, of extract of aloes (Ph. L. 1836), 12 oz., powdered scammony, 4 oz., Castile soap (cut small), 3 oz., and evaporate (distil) to a proper consistence; adding, towards the last, powdered cardamoms, 1 oz.

3. (Wholesale.) The formulæ adopted by the wholesale druggists are mere modifications of that of the Ph. L. 1809; water being used instead of spirit as the menstruum, with actual benefit, as we honestly believe, to the quality of the preparation. The following are extensively employed by those who do most in this article, and we can speak highly of the quality of the products obtained by their use.

a. Turkey colocynth, 18 lbs., is boiled in about 20 times its weight of water for five or six hours; to the strained decoction is added hepatic aloes, 40 lbs., which are boiled until dissolved, when the solution is decanted. In the mean time the colocynth is exhausted with a second quantity of water (less than the first), and the strained liquor is added to the undissolved residuum of the aloes, and boiled for a *few minutes; after* which it is drawn off and *mixed with* the first decoction of aloes; the mixed liquors are then allowed to stand until quite cold (commonly until the next day), to deposit the resinous portion. The liquor is next decanted or drawn off, and set evaporating as quickly as possible; as soon as the consistence of treacle is arrived at, the whole is allowed to cool considerably, and moist sugar (clean), 4 lbs., and Castile soap, 10 lbs. (previously melted with a little water), are added; powdered scammony, 6 lbs., is next gradually sifted in, the extract all the time being assiduously stirred by a second person. Lastly, the heat is further moderated, and the stirring continued until a rather harder consistence is acquired than is proper for the extract, when the steam is wholly 'shut off,' or the vessel removed from the heat, and as soon as the whole has become sufficiently cool to prevent any considerable evaporation of the spirit, essence of cardamoms, 2 lbs. (say, 1 quart), is expertly stirred in; and the extract at once (whilst still warm) put into stone jars or pots, and tied or covered over, for store or use. The product is usually labelled 'EXT. COLOCYNTH. COMP. OPT.' It looks well, and smells very aromatic, and is really an excellent preparation.

b. Turkey colocynth, 2½ lbs.; hepatic aloes, 5½ lbs.; powdered scammony, 1½ lb.; powdered cardamoms, 6 oz. (or essence, ½ pint); Castile soap (genuine), 1 lb. 2 oz.; pale moist sugar, ½ lb.; proceed as last. This produces a beautiful article, and of unquestionable quality, equally effective, and milder in its action than the College preparation. It is labelled and sent out as EXT. COLOCYNTH. COMP. PH. L. (1836).

4. (Ph. L. 1809.) Colocynth, 6 drs. (6 parts); aloes, 1½ oz. (12 parts); scammony, ½ oz. (4 parts); hard soap, 3 drs. (3 parts); cardamoms, 1 dr. (1 part); as No. 3, *a* (nearly).

Qual., &c. Compound extract of colocynth is often adulterated with acrid cathartics to make up for the deficiency or inferiority of its proper ingredients, and foreign matter often becomes mixed with it by the use of impure scammony. The presence of cape aloes may usually be detected by the nauseous odour; chalk (an article frequently present in bad scammony), by placing a little ball of the extract in a glass tube, and pouring over it some dilute hydrochloric or acetic acid, when an effervescence will ensue, if that substance be present; jalap, scammony adulterated with fecula, and other starchy substances, by the filtered decoction of the extract turning blue on the addition of tincture of iodine; gamboge, by the decoction becoming deep red on the addition of liquor of potassa, and by a filtered alcoholic solution of the extract forming a yellow emulsion with water, which becomes transparent and assumes a deep-red colour on the addition of caustic potassa; and further, by this solution (if the alkali is not in excess) giving a yellow precipitate with acids and with acetate of lead, a brown precipitate with sulphate of copper, and a very dark brown one with the
also by the ethereal solution of
dropped on water yielding an
film, soluble in caustic potassa,
gamboge.

Dose. 3 grs. to 15 grs. It is a
yet certain, purgative. It may be
calomel without the latter being
2½ or 3 grs., mixed with an equ
blue pill and taken overnight, form
aperient in dyspepsia, liver com
See ABERNETHY MEDICINES.

Obs. There are few formulæ
undergone so many alterations in the
the College as that for compound
colocynth. Before 1809, proof spi
dered to be employed as the menstru
omitting the soap, the preparation
that of the Ph. L. 1836. In 1809, th
directed water to be used instead of
added a certain quantity of soap. In
edition of the Pharmacopœia (1815),
was again omitted; but in the edition
the formula of 1809 was again adop
stituting, however, proof spirit for th
These directions were also continued
edition of 1836. In the last London
copœia (1851) the formula for this
omitted altogether, and in its place
(PILULA COLOCYNTHIDIS COMPOSITA)
serted.

The compound extract of colocynth
simple and compound extracts of
are in greater demand in the wholesale
and are sold in larger quantities at
than all the other medicinal extracts
gether. As a proof, if it were necess
honesty is the best policy, it may be
that a certain metropolitan druggist,
able for the superiority of this prep
has obtained no inconsiderable fortune
sale alone; while the host of miserable
of the evaporated decoction of musty co
seed, Cape aloes, worthless scammony,
scentless cardamoms, sold under the
attempt to ruin each other, by offering
rubbish at a price that precludes the
bility of a large profit, or even of the
ment of a respectable connection.

Extract of Conia. See EXTRACT OF
LOCK.

Extract of Contrayer'va. *Syn.* EXTRA
CONTRAYERVÆ, L. *Prep.* (Palat. Cod.)
contrayerva root, as EXTRACT OF CINCH
Ph. L.—*Dose.* 10 grs. to ½ dr.; as a di
retic tonic, in low conditions of the syste

Extract of Copai'ba. *Syn.* RESINOU
TRACT OF COPAIBA; EXTRACTUM COP
E. C. RESINOSUM, L. *Prep.* (Mr. T
From balsam of copaiba, by distilling o
oil, until the residuum assumes the consi
of an extract.—*Dose.* 10 to 20 grs., or
One of the many useless preparations
encumber modern pharmacy. It may be
in 3-dr. doses without any perceptible
beyond a fit of indigestion.

l'che. *Syn.* EXTRACTUM CO-
CIS C., L. *Prep.* From co-
m pseudo-China), as EXTRACT
which it for the most part
1 to 3 grs.
h Grass. *Syn.* EXTRACT OF
EXTRACTUM GRAMINIS, L.
L.) From the root of couch
ass (*Triticum repens*), as EX-
T—P. Cod.
fresh root, as EXTRACT OF
.
LLAGO GRAMINIS, EXTRACTUM
DUM, L.—Ph. Hann. 1831.)
ion of the fresh root of couch
d to the consistence of new
L—*Dose.* 15 grs. to ½ dr., or

'bebs. *Syn.* EXTRACTUM CU-
. 1. From the alcoholic tinc-
. by a very gentle heat.—*Dose.*
.
er.) To the last add a little
ile soap, when it begins to
aporate to a pilular consistence.
. to 30 grs.
IQUOR CUBEBÆ, EXTRACTUM C.
—*a.* Cubebs (ground in a coffee-
ectified spirit, 1 quart; prepare
her by displacement or by di-
veek, and reduce it, by distilla-
gentle heat, until the whole mea-
1 pint. Every fl. oz. represents
.—*Dose.* 20 to 40 drops.
e.) From cubebs and proof spirit,
by percolation; without subse-
tion. Represents its own weight
Dose. ½ to 1 fl. dr.
S. 1851.) Cubebs, 1 lb. (nearly);
make 1 quart of tincture; then
int of the ether by the heat of a
and expose the residuum in a
l until the remainder of the ether
d.
sinous; EXTRACTUM CUBEBÆ, E.
E. C. OLEO-RESINOSUM, L.)—*a.*
) The essential oil resulting from
istillation of any given quantity
mixed with the resinous extract
vaporating a tincture of the dried
le with rectified spirit; the whole
d to the consistence of a thick
. of cubebs yields about 6 oz. of

ge.) Cubebs are first exhausted
and then with proof spirit, in a
apparatus; the alcoholic tincture
to an extract over a water bath,
d, the ethereal tincture is mixed
the mixture abandoned to spon-
oration until the ether is vola-

eter.) An ethereal tincture (by
) is poured into a large retort,
drawn over by the heat of a
the evaporation of the residuum, *begins to thicken*, added to the proper consistence, is carried on at a heat not exceeding 120° Fahr. The formula of the Ph. Baden. is nearly similar. Said to represent 6 to 8 times its weight in cubebs. 1 lb. yields 2 oz. of this extract.

d. (Hamb. Cod. 1845.) This resembles *a* (*above*).

Obs. This extract has a darkish brown colour, and tastes and smells strongly of cubebs. It is only slightly soluble in water.—*Dose.* 5 grs. to 20 grs.; made into an emulsion or pills, or enclosed in a capsule. See CUBEBS.

Extract of Cu'cumber. See ELATERIUM.

Extract of Cuspa"ria. EXTRACT OF ANGOSTURA BARK; EXTRACTUM CUSPARIÆ, E. CORTICIS C., E. ANGOSTURÆ, L. *Prep.* 1. From angostura bark, as EXTRACT OF CINCHONA—Ph. L.

2. (Alcoholic.) As EXTRACT OF CINCHONA—Ph. E. Stronger than the last. Both are aromatic, bitter, tonic, and stimulant.—*Dose.* 10 grs. to ½ dr.; in dyspepsia, chronic diarrhœa, dysentery, &c.

Extract of Daff'odil. *Syn.* EXTRACTUM NARCISSI, L. *Prep.* 1. From the fresh flowers of daffodil or yellow narcissus (*Narcissus pseudo-narcissus*), as EXTRACT OF ACONITE—Ph. L.

2. (Alcoholic.) From the dried flowers, as EXTRACT OF BOX. Both are pectoral and expectorant; and in large doses nauseant and emetic.—*Dose.* ½ gr. to 2 grs.; in hooping-cough, &c.

Extract of Dandeli'on. See EXTRACT OF TARAXACUM.

Extract of Digita'lis. See EXTRACT OF FOXGLOVE.

Extract of Dog's Grass. See EXTRACT OF COUCH GRASS.

Extract of Dog'wood. *Syn.* EXTRACTUM CORNÛS, E. CORNI, L. *Prep.* From American or tree dogwood (*Cornus Florida*), as EXTRACT OF CINCHONA BARK.

Obs. In its general effects, American dogwood approaches the cinchonas, and is said to be not inferior to them in the cure of intermittents. (Bigelow.) It contains a peculiar bitter principle, called cornine. Several other varieties of the genus *Cornus*, as round-leaved dogwood (*Cornus circinata*), swamp dogwood (*Cornus sericea*), &c., are used in America, but are less valuable.

Extract of Dulcama"ra. See EXTRACT OF BITTER SWEET.

Extract of Elate'rium. *Syn.* INSPISSATED JUICE OF THE SQUIRTING CUCUMBER; SUCCUS SPISSATUS MOMORDICÆ ELATERII. For preparation and recent synonyms, see ELATERIUM.

Extract of El'der Berries. *Syn.* ELDER ROB; ROOB SAMBUCI, EXTRACTUM SAMBUCI, E. S. NIGRÆ, E. BACCARUM S., SUCCUS SAMBUCI INSPISSATUS, L. *Prep.* 1. (Ph. L. 1788.) The expressed and depurated juice of elder berries, evaporated to the consistence of honey.

2. (*Ph. E. 1744.*) To the above, when it *begins to thicken*, add 1-5th part of sugar.

3. (Ph. Bor.) As the last (nearly), but adding only 1 oz. of white sugar to each pound of the extract whilst still warm.—*Dose.* 1 to 4 drs.; in rheumatism, gout, and various skin affections.

Extract of El'ecampane. *Syn.* EXTRACTUM INULÆ, E. RADICUM I. CAMPANÆ, E. HELENII, L. *Prep.* 1. (Ph. L. 1746.) From a decoction of the dried root.

2. (P. Cod.) As EXTRACT OF BISTORT—P. Cod.

3. (Ph. Suec. 1845.) From a tincture prepared with proof spirit and water, equal parts. —*Dose.* 10 grs. to ½ dr.; as a diaphoretic, expectorant, and tonic; in asthma, hooping-cough, various skin diseases, &c.

Extract of Elm. *Syn.* EXTRACTUM ULMI, E. CORTICIS U., L. *Prep.* 1. From the decoction of the bark of the common elm (*Ulmus campestris*).

2. (Soubeiran.) As EXTRACT OF BOX. Astringent and alterative.—*Dose.* 20 grs. to 1 dr.; in secondary syphilis, chronic skin affections, &c.

Extract of Er'got. *Syn.* AQUEOUS EXTRACT OF ERGOT, HÆMOSTATIC EXTRACT; EXTRACTUM ERGOTÆ, E. E. AQUOSUM, E. SECALIS CORNUTI, E. HÆMOSTATICUM, L. *Prep.* 1. (B. P.) *Extractum Ergotæ Liquidum.* Ergot in coarse powder, 16; ether, 20; distilled water, 70; rectified spirit, 8. Shake the ether in a bottle with half its bulk of the water, and, after separation, decant the ether. Place the ergot in a percolator, and free it from oil by passing the washed ether through it; remove the marc and digest it in the remainder of the water for twelve hours at 160° F. Press out the liquor, and evaporate it to 9, and when cold add the 8 of spirit; allow it to stand for an hour to coagulate, filter, and make up the quantity to 16.—*Dose.* 15 to 30 minims.

According to Squire, the amount of ether employed should be double the above, in two percolations, and the marc should be dried in the air before digesting with water. See ERGOTINE (Bonjeau's).

2. (Alcoholic; EXTRACTUM ERGOTÆ ALCOHOLICUM, L.) See ERGOTINE (Wigger's).

Extract of Fern. *Syn.* EXTRACTUM FILICIS LIQUIDUM—B. P. See EXTRACT OF MALE FERN.

Extract of Flesh. See EXTRACT OF MEAT, ESSENCE OF BEEF, TEA (Beef), &c.

Extract of Fox'glove. *Syn.* EXTRACTUM DIGITALIS (Ph. E.), L. *Prep.* 1. (Ph. L. 1836.) From the leaves of *Digitalis purpurea*, as EXTRACT OF ACONITE—Ph. L.

2. (Ph. E.) From the filtered expressed juice, either evaporated *in vacuo*, with the aid of heat, or by exposure to a current of dry air.

3. (P Cod.)—*a.* As EXTRACT OF BISTORT —P. Cod.

b. As EXTRACT OF BOX—P. Cod.

4. (Ph. Baden.) As ALCOHOLIC EXTRACT OF ACONITE—Ph. Bad.

Obs. The juice of foxglove is injured by exposure to air and evaporation should therefore be rapidly as possible, but at a low It is narcotic, sedative, and is poisonous.—*Dose.* ¼ gr., cautiously or 3 grs. It is principally giv dropsy, diseases of the heart, sumption, epilepsy, scrofula, and extract spoils by long keeping. are stronger than the rest, and is omitted in the present Ph. L.

Extract of Fu'mitory. *Syn.* FUMARIÆ, L. *Prep.* 1. From fusion or decoction of the dried mon fumitory (*Fumaria officinali*

2. (P. Cod.) From the clarifie fresh herb. Slightly aperient, and alterative. It has been give tions of the liver and cutaneous the leprous kind.

Extract of Galls. *Syn.* EXTRAC E. GALLARUM, L. *Prep.* 1. fusion by maceration or displa cold water.

2. From the hot infusion or de first is to be preferred. Astrin chiefly in ointments and injectio foul ulcers, &c., and, internally, rhages, spitting of blood, &c.

Extract of Gen'tian. *Syn.* GENTIANÆ (B. P.), L. *Prep.* Gentian root (sliced), 3 lbs.; di (temperate), 4 pints; macerate f and gently express the liquor; rep ration with water, 1 quart, for 6 evaporate the mixed liquors.

2. (Ph. L. 1836.) From the o sion of the root made with 10 o weight of boiling water, the mac continued for 24 hours.

3. (Ph. E.) From an infusi by percolation with cold water. mulæ of the Ph. Baden, Paris, a similar.

4. (B. P.) Gentian 1 lb.; wa 10; macerate for 2 hours, boil strain, and evaporate to a soft pi ence.—*Dose.* 10 to 15 grs.

5. (Ph. D. 1826.) From the d

Obs. On the large scale, thi almost universally prepared by ex root by coction with water, as formula. When well prepared, it smoothest and brightest extracts macopœia. Good gentian root yi sion in hot water fully 50%, and about 60% of extract.—*Dose.* 1 grs., two or three times daily, as bitter and tonic; either alone with rhubarb, ginger, or aloes. ever, more especially used as a chalybeates and other metallic The principal consumption of ext tian is by the brewers, in lieu of h

6. (HARD E. OF G.; E. G. DUR

tle **heat until brittle enough**

d's. See SOLUTION OF SUB-
.

aiac'um. *Syn.* EXTRACTUM
p. 1. (Ph. L. 1746.) From
vings or sawdust, exhausted
vater; as soon as the mass be-
h of rectified spirit is to be

t, omitting the spirit. Dia-
ic, and alterative; in dropsy,
n, skin diseases, &c.

uarana'. *Syn.* EXTRACTUM
PAULLINIÆ, L. *Prep.* (Dr.
m tincture of guarana (seeds of
lis), prepared by coction with
onic and alterative.—*Dose.* 2
or thrice daily.

mostat'ic. See EXTRACT OF

dge Hyssop. *Syn.* EXTRACTUM
Prep. 1. (Ph. Bor.) From
tiola officinalis), as ALCOHOLIC
ONITE—Ph. Bor.
en.) As EXTRACT OF ACONITE

As VINOUS EXTRACT OF CIN-
gative, diuretic, and vermifuge.
o 5 grs., gradually increased,
ffects; in dropsy, jaundice, gout,
een said to be the basis of the
AU MÉDICINALE D'HUSSON.'

Hel'lebore. The extracts pre-
ree different plants may be in-
this head:—

T OF BLACK HELLEBORE; EX-
LEBORI, E. H. NIGRI, L.)—*a.* (Ph.
om the infusion or decoction of
ore (*Helleborus officinalis*). —
2 grs.
ic—P. Cod. & Ph. U. S.) As
BOX (nearly). That of the Ph.
r.—*Dose.* 3 to 8 grs.
lcoholic—Cottereau.) Powdered
re, 2 lbs.; salt of tartar, ½ lb.;
(sp. gr. ·935), 7 pints; digest 12
xpress the tincture; add to the
wine, 7 pints; digest for 24
s, mix the tinctures, filter, and
Dose. 2 to 6 grs.
en prepared by coction with water
d of soluble matter, black helle-
lds about 40% of extract. In small
alterative, purgative, and resolv-
r ones, it is a drastic, hydragogue
d emmenagogue, dangerous unless
d its effects carefully watched.

CT OF GREEN HELLEBORE, E. OF
L, E. OF ITCH-WOOD; EXTRACTUM
IDIS, L.) From the fresh root
the green hellebore (*Veratrum*
EXTRACT OF ACONITE—Ph. L.—
to ¼ gr. Used in America in the
white hellebore.

CT OF WHITE HELLEBORE; EXTRACTUM VERATRI, E. HELLEBORI ALBI, L.) From the root (rhizome) of the white hellebore (*Veratrum album*), as EXTRACT OF BLACK HELLEBORE.—*Dose.* $\frac{1}{12}$ gr. to ¼ gr. Emetic, purgative, stimulant, and highly acrid. In gout, rheumatism, and nervous affections, mania, &c. See VERATRINE.

Extract of Hem'lock. *Syn.* INSPISSATED JUICE OF HEMLOCK; EXTRACTUM CONII (B. P.), SUÇCUS SPISSATUS CONII, L. *Prep.* 1. (B. P.) The inspissated juice of the fresh plant, prepared as directed for EXTRACTUM BELLADONNÆ.—*Dose.* 4 to 6 grs.

2. (Ph. L.) From the fresh plant (*Conium maculatum*), as EXTRACT OF ACONITE—Ph. L.

3. (Ph. E.) As EXTRACT OF FOXGLOVE—Ph. E.

4. (Ph. D.) As EXTRACT OF BELLADONNA—Ph. D.

Obs. Of all the inspissated juices (not even excepting that of aconite), this is the one most readily injured by exposure to the air and heat, and which soonest loses its qualities by age. Its active principle is CONINE. Extract of hemlock has a greenish colour, and a strong odour of the fresh-bruised plant. It is "of good quality only when a very strong odour of conia (a 'mouse-odour') is disengaged by degrees, on its being carefully triturated with liquor of potassa." (Ph. E.) "The extracts of hemlock may become feeble, if not inert, in one of two ways,—either by the heat being continued after the concentration has been carried to a certain extent, or by long keeping. On the one hand, I have always observed that from the point at which the extract attains the consistence of thin syrup, ammonia begins to be given off in abundance, together with a modified odour of conine; and, on the other hand, I have found extracts, which were unquestionably well prepared at first, entirely destitute of conine in a few years." (Christison.) "The most active extract is that which is procured by moderate pressure from the leaves only." (Brande.) "The extract of the Ph. D., being freed from the inert albumen and chlorophyll, contains most of the active principle, and is nearly soluble in water." (Royle.) On the large scale, the whole of the green portion of the plant is pressed for juice. 1 cwt. of hemlock yields from 3 to 5 lbs. of extract.—*Dose.* 2 grs., gradually increased to 5 grs., or more, until some obvious effect is produced; as an anodyne, alterative, and resolvent in various obstinate disorders, as glandular and visceral enlargements, foul and painful ulcers, scrofula, cancer, neuralgia, rheumatism, troublesome coughs, &c.

5. (Alcoholic; EXTRACTUM CONII ALCOHOLICUM, L.)—*a.* (Ph. Baden.) As ALCOHOLIC EXTRACT OF ACONITE—Ph. Baden.

b. (P. Cod.) As the last, but using proof spirit.—*Dose.* ½ to 2 grs.

6. (Dried; EXTRACTUM CONII SICCUM, L.)—*a.* As the DRIED EXTRACT OF ACONITE—P. Cod.

b. (Archer.) By drying the extract of the Dublin College with a continuous current of warm air.

Extract of Hemp. *Syn.* EXTRACT OF AMERICAN HEMP; EXTRACTUM APOCYNI, E. A. CANNABINI, L. *Prep.* From the root of the *Apocynum cannabinum*, as EXTRACT OF GENTIAN. A hydragogue cathartic.—*Dose.* 2 to 6 grs.; in dropsy, &c. The plant from which this extract is prepared is called 'INDIAN HEMP' in the United States of America, a practice which should be avoided, as this name is now almost exclusively appropriated to *Cannabis Indica*, a variety of the common hemp (*Cannabis sativa*, var. *Indica*) growing in India. See EXTRACT OF INDIAN HEMP.

Extract of Hen'bane. *Syn.* EXTRACT OF HYOSCYAMUS; EXTRACTUM HYOSCYAMI (B. P.), SUCCUS SPISSATUS HYOSCYAMI, L. *Prep.* 1. (Ph. L.) From the fresh leaves and leaf-stems of common henbane (*Hyoscyamus niger*), as EXTRACT OF ACONITE—Ph. L.

2. (Ph. E.) As EXTRACT OF FOXGLOVE—Ph. E.

3. (B. P.) From the fresh leaves and young branches, as EXTRACT OF BELLADONNA.—*Dose.* 3 to 6 grs.

4. (Ph. U. S.) From the expressed juice coagulated by heat and strained.

Obs. In the Paris Codex extracts are ordered to be prepared from henbane both by the processes Nos. 1 and 4 above.—*Product* (by the ordinary method):—1 lb. of the fresh leaves yielded fully 8 drs. of extract (Geiger); 1 cwt. yielded 4 to 5 lbs. (Brande); 1 cwt. of the recent plant yielded, by an ordinary screw press, 59½ lbs. of juice, and this, evaporated in a water bath, gave 5 lbs. 9 oz. of extract (Squire); 1¾ cwt. of the green herb yielded 11 lbs. of extract (Gray.)—*Dose.* 2 to 10 grs.; as an anodyne, hypnotic, antispasmodic, sedative, and narcotic; more especially in those cases in which the use of opium is objectionable. *Externally*, as a topical application to sore or inflamed parts, either made into an ointment or spread on plaster.

5. (Alcoholic; EXTRACTUM HYOSCYAMI ALCOHOLICUM, L.) The formulæ of the Ph. Bad., Par. & U. S. are similar to those for ALCOHOLIC EXTRACT OF ACONITE.

6. (E. OF HENBANE SEEDS; EXTRACTUM SEMINUM HYOSCYAMI, L.—P. Cod.) An extract of the seeds made with spirit sp. gr. ·900 (= about 16 o. p.) is dissolved in 4 parts of cold water, and the solution filtered and evaporated. Stronger than the simple extract.—*Dose.* ½ gr. to 3 grs.

Extract of Ho'ly This'tle. *Syn.* EXTRACTUM CARDUI BENEDICTI, L. *Prep.* 1. (Ph. Baden.) From holy or blessed thistle (*Carduus Benedictus*) by displacement with cold water.

2. (Ph. Bor.) As EXTRACT OF GENTIAN—Ph. L. (nearly). Tonic, diaphoretic, febrifuge, often diuretic, and occasionally emetic. —*Dose.* 5 to 15 grs., as a tonic or stomachic, chiefly.

Extract of Hops. *Syn.* EXTRA
(B. P., Ph. L. & E.); E. HUMU
Prep. 1. (B. P.) Hop, 8; r
15; distilled water, 80. Mace
the spirit for 7 days, press ou
filter, and distil off the spirit,
extract; boil the residual hop
for one hour, then express the
and evaporate on a water bath
ence of a soft extract. Mix th
and evaporate at a temperature
160° to a pilular consistence.—
grs.

2. (Ph. L.) From commer
strobiles or catkins of *Humulus*
lbs.; boiling distilled water, 2
rate for 24 hours, boil to a
whilst hot, and evaporate to
sistence. The form of the Ph.
similar.

3. (Ph. D.) As EXTRACT OF
Tonic and stomachic, and slig
and hypnotic.—*Dose.* 5 grs.
dyspepsia, and cases that do not
use of opium. 1 cwt. of ordin
about 40 lbs. of extract.' (Brand
gists usually employ hops 2 or m
called by the dealers 'yearlin
'old olds,' because these may be
⅔ to ½ the price of those of th
growth. The first of the above
to have only ⅔ the strength of
second about ½; and the last lit
least in a medical point of view.

4. (Alcoholic; EXTRACTUM
HOLICUM, L.—Cottereau.) By
with proof spirit. Stronger tha
extract.

Extract of Hore'hound. *Syn.*
MARRUBII, L. *Prep.* 1. From t
as EXTRACT OF ACONITE.

2. From the infusion or dec
spasmodic, pectoral, tonic, and
—*Dose.* 10 grs. to 1 dr.

3. (Ph. Baden.) By displace
water.

4. (Alcoholic; EXTRACTUM M
HOLICUM, L.)—*a.* From a tinct
proof spirit. Said by M. Tho
considerable power as a febrifuge
to 20 grs.

b. (Ph. Lusit.) From a tinct
a mixture of rectified spirit, 1 p
7 parts. Inferior to the last.

Extract of Ind'ian Hemp. *Syn*
HEMP RESIN, ALCOHOLIC EXTR
HEMP; EXTRACTUM CANNABIS I
ALCOHOLICUM, RESINA CANNA
1. (B. P.) Indian hemp in coa
rectified spirit, 5; macerate sev
out the tincture, distil off t
evaporate.—*Dose.* ½ to 1 grain
2. (O'Shaughnessy.) The
tops of Indian hemp ('GUNJAH'
rectified spirit until all the re
when most of the spirit is disti

mpleted by the heat of a water
yields about 7 lbs.
on). By slowly acting on the
a the vapour of alcohol, by a spe-
tion; the spirit of the resulting
tly removed by distillation, and
w evaporation at a temperature
0° Fahr. 1 cwt. yields about
f the last two, 1 to 3 grs., gra-
d.
kmith.) The bruised 'gunjah' is
a tepid water, then with a solu-
ate of soda (1 of carbonate to 2
d next with pure water; it is
ried, and exhausted by displace-
ified spirit; the tincture is agi-
nilk of lime (containing 1 oz. of
b. of gunjah), and, after filtration
, any retained lime is precipi-
e sulphuric acid in slight excess;
next agitated with animal char-
n filtered; most of the spirit is
by distillation, and 3 or 4 times
ter being added, the remaining
ed by a gentle heat; lastly, the
ter is poured off, and the resin
resh water, and dried. Product,
cing *dose*, ¼ gr.
i; EXTRACTUM CANNABIS INDICÆ
, L.—Ph. D.) From the crude
dian hemp, as imported ('CHUR-
rectified spirit, 4 fl. oz.; dissolve,
ecation, decant, and evaporate.
preparations of Indian hemp are
æsthetic, anodyne, hypnotic, sti-
nic, and aphrodisiac, and, in over-
duce catalepsy. They have been
l in hysteria, hydrophobia, cholera,
chorea, convulsions, and various
spasmodic and nervous affections
character. According to the ob-
Dr. O'Shaughnessy, 1 gr. of the
uced catalepsy in a rheumatic
e extract prepared with the plant
botanic gardens has quite a differ-
that of the Indian plant; and it
that the inhabitants of this coun-
usceptible to its action than those
d consequently bear the drug in
This hemp is known in India as
er of pleasure,' the 'exciter of
'cementer of friendship,' the
a reeling gait,' the 'laughter-
See EXTRACT OF HEMP (*above*),

Ipecac'uanha. *Syn.* EXTRACTUM
A, L. *Prep.* 1. (P. Cod.) From
as EXTRACT OF BOX—P. Cod.
lor.) As EXTRACT OF HENBANE
ectorant and emetic.—*Dose.* 1½ to

I'ron. *Syn.* EXTRACTUM FERRI,
L. *Prep.* 1. From tincture of
ron.—*Dose.* 2 to 10 grs.; as a
nic.
und.) *See* EXTRACT OF APPLE.

Extract of Jal'ap. *Syn.* EXTRACTUM JALAPÆ (B. P.), E. SIVE RESINA JALAPÆ (Ph. E.), L. *Prep.* 1. (B. P.) Jalap in coarse powder, 1; rectified spirit, 5; distilled water, 10; macerate the jalap in the spirit for seven days, press out the tincture, then filter, and distil off the spirit, leaving a soft extract; again macerate the residual jalap in the water for four hours, express, strain through flannel, and evaporate by a water bath to a soft extract; mix the two extracts, and evaporate at a temperature not exceeding 140° F. to a proper consistence for forming pills.—*Dose.* 5 to 15 grs.

2. (Ph. L.) Jalap (powdered) 2½ lbs.; rectified spirit, 1 gal.; digest four days, and express the tincture; boil the 'marc' in water, 2 galls.; until reduced to ½ gal.; filter the tincture and decoction separately, and let the one distil and the other evaporate until each thickens; lastly, mix the two and complete the evaporation.—*Product.* About 66% = 16% of alcoholic and 50% of aqueous extract. (Brande.) 18 lbs. yield 12 lbs. of extract. (Lab. Journ.)—*Dose.* 6 to 15 grs.

3. (Ph. E.) From tincture of jalap prepared by displacement with rectified spirit. It consists of impure resin of jalap. It is more active than the last.—*Prod.* 16%.—*Dose.* 2 to 6 grs.

Obs. Extract of jalap is an active purgative. It should be well beaten up with a little sulphate of potassa, sugar, or some aromatic powder, to prevent it griping. The substance commonly sold as extract of jalap in the shops is prepared by boiling jalap root for 3 or 4 hours in water, when it is taken out, and well bruised or sliced, and again boiled with water until exhausted of soluble matter. The mixed decoctions are then allowed 12 or 14 hours for defecation, after which the supernatant portion is decanted and evaporated.

Extract of jalap "should be kept in the soft state (EXTRACTUM JALAPÆ, E. J. MOLLE), so as to form pills; and in the hard state (HARD EXTRACT OF JALAP; EXTRACTUM JALAPÆ DURUM), that it may be rubbed to powder." (Ph. L.)

Extract of Ju'niper. *Syn.* EXTRACTUM JUNIPERI, E. BACCARUM J., L. *Prep.* (P. Cod.) Macerate juniper berries in water at 77° to 86° Fahr., for 24 hours, strain, repeat the process with a fresh quantity of water, mix the liquors, filter, and evaporate.—*Dose.* 20 grs. to 1 dr.; as a stimulant diuretic, in dropsy, &c.; and also as a pill-basis.

Extract of Kalada'na. *Syn.* EXTRACTUM KALADANÆ, L. *Prep.* (Bengal Disp.) From the tincture of the seeds of kaladana (*Pharbitis Nil*). Purgative. Said to be equal to EXTRACT OF JALAP, and of double the strength.

Extract of Lettuce. *Syn.* INSPISSATED JUICE OF LETTUCE; EXTRACTUM LACTUCÆ (B. P.), L. *Prep.* 1. (*B. P.*) The inspissated juice evaporated to a pillular consistence, according to the directions given for EXTRACTUM BELLADONNÆ.

2. (Ph. L.) From the fresh leaves of garden lettuce (*Lactuca sativa*), as EXTRACT OF ACONITE—Ph. L. Anodyne, sedative, hypnotic, and antispasmodic.—*Dose*. 3 to 10 grs. 1 cwt. of lettuce yields 4 lbs. to 5 lbs. of extract.

3. (Probait.) From the external parts of the stalks and the old and yellow leaves, after the plants have flowered, by maceration in water for 24 hours, and decoction for 2 hours; the expressed liquid is first evaporated by a gentle heat, and afterwards spread on shallow dishes, and dried by exposure to a current of air. Stronger than the last.—*Dose*. 1 to 5 grs.

4. (E. OF WILD LETTUCE, INSPISSATED JUICE OF W. L.; EXTRACTUM LACTUCÆ VIROSÆ, SUCCUS SPISSATUS L. V.—Ph. E., L.)—*a*. (Ph. E.) From the leaves of strong-scented wild lettuce (*Lactuca virosa*).[1]

b. (P. Cod.) As ALCOHOLIC EXTRACT OF ACONITE—P. Cod.

c. (Ph. Baden.) As EXTRACT OF FOXGLOVE—Ph. Baden. See LACTUCARIUM.

Extract of Liq'uorice. *Syn*. EXTRACTUM GLYCYRRHIZÆ (B. P.), L. *Prep*. 1. (SOFT E. OF L.; EXTRACTUM GLYCERRHIZÆ MOLLE, L.)—*a*. (Ph. L.) From fresh liquorice root, as EXTRACT OF HOPS—Ph. L.

b. (Ph. E.) From the fresh root, cut into slices, dried, and powdered, as EXTRACT OF GENTIAN — Ph. E. The form of the Ph. Baden is very similar.

c. (Ph. D.) As ordered for simple extracts (EXTRACTA SIMPLICIORA—Ph. D.).

d. (B. P.) Liquorice root in coarse powder, 1; cold distilled water, 5; macerate the root in half the water for twelve hours, strain, and press; again macerate the pressed marc with the remainder of the water for 6 hours, strain and press, mix the strained liquors, heat to 212° F., strain, and evaporate to a pill consistence.—*Dose*. ½ to 1 dr.

e. (U. S. Disp.) Crude liquorice (SPANISH JUICE), q. s., is dissolved in water, and the solution filtered and evaporated. To produce a good article (EXTRACTUM GLYCYRRHIZÆ PURIFICATUM) in this way, the solution should be allowed some hours for defecation, and should not be decanted and strained until quite cold.

Obs. Soft extract of liquorice is often employed as a pill-basis, and the hard extract (SPANISH JUICE, &c.) is used as a lozenge to allay tickling cough. The principal portion of the latter is, however, consumed by the porter brewers and brewers' druggists. The product of the last formula, evaporated until it is quite solid when cold, and made into small pipes, sticks, or rolls, forms the BEST REFINED LIQUORICE or REFINED JUICE of the shops.

2. (HARD E. OF L., SPANISH JUICE, S. LIQUORICE, GLYCYRRHIZIN, BLACK SUGAR; EXTRACTUM GLYCYRRHIZÆ SIMPLEX, E. G. DURUM, SUCCUS G., S. G. SPI
is seldom prepared by the E
being principally imported i
from Spain and Italy. Th
(SOLAZZI JUICE) is the most e
deal of the foreign extract is m
or the pulp of plums, hence it
It also frequently contains cop
the boilers in which it is pr
tract prepared from the fresh
preferred to the best foreign,
a less sweet and agreeable t
JUICE is prepared by dissol
juice in water, filtering and ev
LIQUORICE, and *above*.

Extract of Lobe'lia. *Syn*.
OF INDIAN TOBACCO; EXTRA
E. L. INFLATÆ, L. *Prep*.
Lobelia seeds (bruised), 8 oz.
(sp. gr. ·935), 4 pints; aceti
by maceration for 24 hours,
displacement. Expectorant
in small doses; emetic and n
ones. It is principally used
other chest diseases.—*Dose*. ¼

Extract of Log'wood. *Sy*
HÆMATOXYLI (B. P.), E. H.
(Ph. E.), L. *Prep*. 1. (B.
chips, 1; boiling distilled wat
24 hours, boil to 5, strain, a
an extract, but not in iron ve

2. (Ph. L.) From cut lo
chips), as EXTRACT OF HOPS—

3. (Ph. E.) As the last (ne

4. (Ph. D. 1826 and Whole
decoction.

Obs. The Ph. U. S. 1841
to be rasped. The Ph. Bad
placement with cold water. O
this extract is prepared solel
1 cwt. of wood yields about 2
(Brande); 80 lbs. yield 14 lbs. o
It is kept in two states—har
HÆMATOXYLI DURUM), and sof
The dose of the first is 10 to 2
in wine, or any cordial wate
gent, after each motion in
second is often employed as a
same disease, and is an inexpe
able remedy for simple rel
bowels.

Extract of Lov'age. *Syn*.
VISTICI, L. *Prep*. (Ph. Bade
(*Levisticum officinale*), as EXT
—P. Cod. Aromatic, stomac
retic.—*Dose*. 5 to 15 grs.

Extract of Lu'puline. *Syn*.
PULINÆ, L. *Prep*. 1. From
powder separated from hops
sifting), by infusion in cold w
placement.

2. (EXTRACTUM LUPULINÆ
RATUM.) From the decoction
to extract of hops, but strong
the most aromatic; the last th

Extract of Mad'der. *Syn*. EX

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[1] See general instructions, page 481.

lamb.) From the tincture
Rubia tinctorum), made with
part, and water, 3 parts.
grs.; as a diuretic, emmena-
rifacient; and in jaundice,

log'any. *Syn.* EXTRACTUM
From the chips and sawdust
wietenia *Mahogoni*), It is
is frequently sold for kino.
d in tanning.
le Fern. *Syn.* ALCOHOLIC
FERN; EXTRACTUM FILICIS,
(Dr. Ebers.) From the tinc-
root of male fern (*Lastræa*
e with rectified spirit. In
se. 20 grs. to ½ dr., twice
an electuary with powdered
red by a strong dose of castor

B. P. (EXTRACTUM FILI-
Fern root, in coarse powder,
a sufficiency. Pack closely in
h 1 of the ether, add the rest
il it passes through colourless,
ner, and the liquid extract re-
30 to 60 minims. See OIL OF

alt. *Syn.* EXTRACTUM MALTI,
Prep. From the infusion made
a temperature ranging between
Fahr., drained off, without pres-
porated to the consistence of
itious and laxative.—*Dose.* A
or more, *ad libitum*.
Ma"rygold. *Syn.* EXTRACTUM
L. *Prep.* 1. (Guibourt.) By
f the herb and flowers of the
ygold (*Calendula officinalis*) in
r 24 hours, and subsequent coc-
20 minutes.
len.) As EXTRACT OF ANGELICA
—*Dose.* 2 to 10 grs.; cordial,
lterative, and emmenagogue; in
d scirrhous and cancerous affec-

f May-apple. *Syn.* EXTRACTUM
L. *Prep.* (Ph. U. S. 1841.)
ncture of the root (rhizomes) of
Podophyllum peltatum). — *Dose.*
.; as a substitute for extract of
PODOPHYLLIN.
Mea'dow Saf'fron. See EXTRACT
UM.
Meat. *Syn.* EXTRACT OF FLESH;
CARNIS, L. *Prep.* (Liebig.)
recently killed meat (chopped very
rt; cold water, 8 parts; agitate it
r for 10 minutes; then heat it
o the boiling-point, let it simmer
few minutes, and strain through
whilst still hot; lastly, evaporate
s. 1 lb. of meat yields barely 1
[illegible] OF BEEF, TEA (Beef), &c.
f Mezere'on. *Syn.* MEZEREON
[illegible] MEZEREI, RESINA MEZEREI, L. *Prep.* 1. (Alcoholic; E. M. ALCOHOLICUM, L.)—*a.* Ph. Hamb.) By distilling off ⅚ths of the tincture made with rectified spirit, and filtering the residue, retaining what is left on the filter.

b. By the simple distillation of the tincture.

Obs. Green or brownish green; insoluble in water. ½ oz. mezereon root-bark yielded 1½ oz. (Hamb. Disp.) It is chiefly used in preparing blistering ointments and plasters.

2. (Ethereal; GREEN OIL OF MEZEREON; EXTRACTUM MEZEREI ÆTHEREUM. B. P.)—*a.* B. P. Mezereon bark cut small, 1 lb.; rectified spirit, 8 pints; ether, 1 pint. Macerate the mezereon in 6 pints of the spirit for 3 days, with frequent agitation, strain, and press. To the residue of the mezereon add the remainder of the spirit, and again macerate for 3 days, with constant agitation, strain, and press. Mix and filter the strained liquors, recover the greater part of the spirit by distillation, evaporate what remains to the consistence of a soft extract, put this in a stoppered bottle with the ether, and macerate for 24 hours, shaking them frequently; decant the etherial solution, recover part of the ether by distillation, and evaporate what remains to the consistence of a soft extract.

b. (Ph. Bor.) By digesting alcoholic extract of mezereon in ether for some days with agitation, reducing the tincture to 1-4th by careful distillation, and evaporating the residuum by a gentle heat to the consistence of an extract.

Obs. Both the alcoholic and ethereal extract of mezereon must be kept in stoppered bottles. The latter, like the former, is used as an external irritant.

Extract of Mil'foil. *Syn.* EXTRACTUM MILLEFOLII, E. ACHILLÆ M., L. *Prep.* From the herb milfoil or yarrow (*Achillea millefolium*), as EXTRACT OF HOPS—Ph. L. Astringent, tonic, and alterative.—*Dose.* 10 grs. to ½ dr.

Extract of Mimo'sa Bark. *Syn.* EXTRACTUM CORTICIS MIMOSÆ, L. *Prep.* From the bark of several Australian species of Acacia or Mimosa (*Acacia mollissima, A. decurrens, A. melanoxylon*, &c.). It is chiefly imported from Van Diemen's Land. Astringent. Said to be superior to oak bark for tanning.

Extract of Mone'sia Bark. *Syn.* EXTRACTUM MONESIÆ, E. M. PURIFICATUM, L. *Prep.* From the monesia or buranheim bark (bark of *Chrysophyllum Buranheim*); or from commercial monesia, as EXTRACT OF CATECHU. Astringent.—*Dose.* 4 to 8 grs.

Extract of Mug'wort. *Syn.* EXTRACTUM ARTEMISIÆ, L. *Prep.* From the tops of the common mugwort (*Artemisia vulgaris*), as EXTRACT OF BOX,—P. Cod. An active emmenagogue.

Extract of Myrrh. *Syn.* EXTRACTUM MYRRHÆ, *L.* *Prep.* 1. (Aqueous; EXTRACTUM

MYRRHÆ AQUOSUM, L.)—*a.* From the strained decoction.

b. (Ph. Bor.) As EXTRACT OF ALOES—Ph. Bor., afterwards reducing it to fine powder. The formula of the Ph. Baden is similar.—*Dose.* 6 to 15 grs., or more.

2. (Alcoholic; RESIN OF MYRRH; EXTRACTUM MYRRHÆ ALCOHOLICUM, E. M. RESINOSUM, L.) From the tincture. Tonic and stimulant.—*Dose.* 5 to 10 grs., or more.

3. (Compound; EXTRACTUM MYRRHÆ COMPOSITUM, L.—Swediaur.) Myrrh, 2 oz.; gum arabic (in powder), 2 drs.; triturate, add water, q. s. to form a thick emulsion, and add extract of couch grass, 4 oz. Much recommended in phthisis and uterine ulcerations.—*Dose.* 1 to 2 drs. in water, twice or thrice daily.

Extract of Net′tles. *Syn.* EXTRACTUM URTICÆ, L. *Prep.* (P. Cod.) From the juice of nettles (*Urtica dioica*), as EXTRACT OF ACONITE—Ph. L. Antiscorbutic, diuretic, and narcotic.

Extract of Nose′gay. *Syn.* ESSENCE OF NOSEGAY; EXTRAIT DE BOUQUET, Fr. *Prep.* Flowers of benzoin, 1 dr.; essence of ambergris, 2 fl. oz.; spirits of jasmine and extract (esprit) of violets, of each, 1 pint; spirits of cassia, roses, orange flowers and gillyflowers, of each ½ pint; mix. A delightful perfume.

Extract of Nux Vom′ica. *Syn.* EXTRACT OF KOOCHLA NUTS; EXTRACTUM NUCIS VOMICÆ, B. P. *Prep.* 1. (Aqueous; E. N. V. AQUOSUM, L.—Ph. Bor.) From the powdered nut, as EXTRACT OF HOPS—Ph. L. (nearly.)—*Dose.* 1 to 5 grs.

2. (Alcoholic; EXTRACTUM NUCIS VOMICÆ—Ph. L. E. and D., E. N. V. ALCOHOLICUM, L.)—*a.* (B. P.) Soften nux vomica by steam, dry rapidly, and reduce to fine powder; boil with rectified spirit until exhausted, strain, distil off the spirit, and evaporate to the consistence of a soft extract.—*Dose.* ¼ to 2 grs.

b. (Ph. L.) Koochla or poison nuts (seed or fruit of *Strychnos Nux-vomica*), 8 oz.; rectified spirit, 3 pints; expose them to steam until softened, then bruise, slice, and dry them, and macerate them in 2-3rds of the spirit for 7 days; express the tincture, and repeat the maceration with the remaining 1-3rd of the spirit; again express the liquid; lastly, filter the mixed tinctures, distil off the greater part of the spirit, and complete the evaporation by a gentle heat. The formula of the P. Cod. is similar, but using spirit sp. gr. ·863 (=41 o. p.).

c. (Ph. E.) The sliced and dried nuts are to be ground in a coffee-mill, and either exhausted by percolation with rectified spirit or by boiling the powder in repeated portions of the menstruum. The formulæ of the Ph. Baden and U. S. are similar.

d. (Ph. D. 1826.) From a tincture of the rasped nut made with proof spirit, observing that the extract, whilst thickening, should be
'y stirred.

Obs. This extract consists ch
pure igasurate of strychnia, and i
in similar cases to that alkaloid.
stimulant of the nervous system
—*Dose.* ⅛ gr., gradually and
creased to 2 grs. It is very poi
the large scale, the nuts are grou
mill.

Extract of Oak Bark. *Syn.*
QUERCÛS, E. CORTICIS QUERCÛ
(Ph. D. 1826.) From the decoct
gent.—*Dose.* 10 grs. to ½ dr.
used.

Extract of O′pium. *Prep.* 1
EXTRACT OF OPIUM, SIMPLE E
TRACTUM OPII (B. P.), E. O. AQUOS
E. O. PURIFICATUM, L.)—*a.* (B.
in thin slices, 1 lb.; distilled wa
Macerate the opium in 2 pints of t
24 hours, and express the liquor.
residue of the opium to a uniform
rate again in 2 pints of the water
and express. Repeat the opera
time. Mix the liquors, strain thr
and evaporate by a water bath to
sistence for forming pills.—*Dose.*
or more.

b. (Ph. L.) Opium (powdered),
tilled water (cold), 2½ pints; mi
and macerate for 24 hours, freque
with a spatula; (press), strain, a
maceration for 24 hours with a fr
(2½ pints) of water; lastly, ev
(mixed) strained liquors to a pro
ence. The formulæ of the Ph.
Baden, and P. Cod., are essentially

c. (Ph. D. 1826.) As the last,
boiling water, and exposing the m
to the air for 2 days, before filterin
porating them. Inferior to the la

d. (Purified.) The extract, pre
cold water, is evaporated to dry
dered, and redissolved in cold wate
hours' exposure, and defecation, it
from the dregs, filtered, and gently
as before. Superior to any other
opium made.

Obs. Good opium yields from 6
its weight of extract, but much de
the variety used.—*Dose.* ¼ gr. to
an anodyne, sedative, and hypnotic.
stimulating than ordinary opium.
pared by the third formula is, inde
inferior in its action to the salts of

This extract is kept in both th
soft state (EXTRACTUM OPII DU
MOLLE). A solution of the former,
water, with the addition of a litt
keep it, forms Battley's 'LIQUOR
TIVUS.' The Dublin formula is t
by the wholesale druggists.

Besides the aqueous extract, th
following preparations:—

2. (EXTRACTUM OPII LIQUIDUM,
TRACT OF OPIUM.) Distilled wate
fied spirit, 4. Digest the extract

an hour, stirring frequently;
he spirit. The product should
ose. 10 to 30 minims.

EXTRACTUM OPII ACETICUM, L.
Opium, 1 oz.; distilled vine-
digest 2 days (with heat), de-
evaporate.

; EXTRACTUM OPII ALCO-
Ph. Antwerp.) From the tinc-

coholic; E. OPII AQUO-ALCOHO-
ddei.) The opium, exhausted
ested in warm water, and the
ncture, separately filtered, are
porated.

tized; EXTRACTUM OPII ABSQUE
—a. (P. Cod.) The aqueous
ed with hot water to the con-
syrup, and when cold this is
times its volume of ether, and
requently shaken for a day or
real solution is then decanted,
s repeated with fresh ether, as
solves anything. The original
uct is similar. Said to consist
npure MURIATE OF MORPHINE,
RACTIVE.

nousin-Lamothe.) Aqueous ex-
; resin, 1 part; beat well toge-
ling water, 16 parts; boil to one
d water, 8 parts, filter, and eva-

rmentation; EXTRACTUM OPII
TATIONEM, L.)—*a*. Opium and
h, 4 oz.; water, 1 quart; rub to-
keep the mixture, loosely covered,
uation (about 70° Fahr.), for 10
s; then add of cold water, 1 quart,
t day filter and evaporate.

x.) From an unstrained mixture
. part, with water, 8 parts, and a
; left for a week at a temperature
° Fahr., and then diluted, filtered,
ated. Some parties have recom-
nce juice as the menstruum.

ted; EXTRACTUM OPII TORREFACTI,
rt.) Powdered opium is heated on
over a moderate fire, with constant
long as fumes are given off; it is
sted by treating it twice with 6
weight of water, and the mixed
r filtration, is evaporated.

us; EXTRACTUM OPII VINO PARA-
P. Cod.) From wine of opium. The
tracts of opium (excepting the alco-
regarded as less exciting than the
parations of the drug. The *dose* of
imilar to that of the aqueous ex-

of Or'ange Peel. *Syn.* EXTRACTUM
AURANTII, L. *Prep.* 1. From the
w peel, as EXTRACT OF MADDER.
AURANTIINE.

of Ox-gall. *Syn.* INSPISSATED OX-
EXTRACTUM FELLIS BOVINI, L. *Prep.*
Fresh *ox-gall, strained, and evaporated* in a water bath. *Dose.* 5 to 15 grs.; in pills.

2. (Hunter Lane.) As the last, but reducing the gall to dryness, and then powdering it. It must be preserved in well-corked bottles.—*Dose.* 3 to 12 grs.

Extract of Parei'ra. *Syn.* EXTRACTUM PAREIRÆ (B. P.), L. *Prep.* 1. (B. P.) Pareira root in coarse powder, 1; boiling distilled water, 10, or a sufficiency; digest the pareira with 1½ of water for twenty-four hours, then pack in a percolator, and water till by slow percolation 10 has passed through; evaporate in a water bath to a pilular consistence.—*Dose.* 10 to 20 grs.

2. (Ph. L.) From the root of velvet leaf or pareira brava (*Cissampelos Pareira*), as EXTRACT OF HOPS—Ph. L.

3. (P. E.) As EXTRACT OF LIQUORICE—Ph. E. The P. Cod. formula is similar. Alterative, tonic, and diuretic.—*Dose.* 10 grs. to ½ dr.; chiefly in affections of the bladder.

4. EXTRACTUM PAREIRA LIQUIDUM (B. P.). Pareira in coarse powder, 16; boiling distilled water, 160, or a sufficiency; rectified spirit, 3; macerate in 20 of water for twenty-four hours; pack in a percolator, adding more of the water; allow the liquor slowly to pass until 160 has been collected, or the pareira is exhausted; evaporate to 13, and, when cold, add the spirit; filter and make up to 16.—*Dose.* ½ to 2 drs.

Extract of Par'sley. *Syn.* EXTRACTUM PETROSELINI, L. *Prep.* (P. Cod.) From the root, as EXTRACT OF BISTORT—P. Cod.

2. (M. Peraibe.) From the fresh leaves, as EXTRACT OF ACONITE. Febrifuge and tonic. —*Dose.* 5 to 10 grs.

Extract of Pasque Flower. *Syn.* EXTRACTUM ANEMONIS, L. *Prep.* (P. Cod.) From the recent or dried flower, as either of the EXTRACTS OF ACONITE—P. Cod.—*Dose.* 1 to 4 grs.

Obs. Several species of *Anemone* have been used in medicine, especially *Anemone pratensis* and *A. pulsatilla.* According to Baron Stoerck, the former is resolvent, and is an effectual remedy in various chronic diseases, particularly in amaurosis, cataract, opacity of the cornea, nocturnal pains, suppressions, &c. ½ to 1 gr., combined with sugar of milk, has been highly recommended in hooping-cough.

Extract of Pa'tience Dock. *Syn.* EXTRACTUM PATIENTIÆ, L. *Prep.* From the root of *Rumex Patientia* or garden patience, as EXTRACT OF HOPS. Aperient and stomachic. *Used* in double doses in lieu of extract of rhubarb.

Extract of Paullin'ia. See EXTRACT OF GUARANA.

Extract of Peach Blos'som. *Prep.* From essence of lemons, 1 oz.; pure balsam of Peru, 2 drs.; essence (oil) of bitter almonds, 1 dr.; rectified spirit, 3 pints; spirit of orange flowers, 1 pint; spirit of jasmin, ¼ pint; mix. A pleasant and powerful perfume.

Extract of Pel'litory. *Syn.* EXTRACTUM

PYRETHRI, E. P. ÆTHERO-ALCOHOLICUM, L. *Prep.* (W. Procter.) Alcohol (rectified spirit), 1 pint; ether, ½ pint; mix, and pour it gradually on root of pellitory (*Anacyclus Pyrethrum*), 1 lb., placed in a percolator; afterwards pour on alcohol, 1 pint; and subsequently, sufficient dilute alcohol (proof spirit) to displace 2¼ pints of tincture (ESSENCE OF PELLITORY, TOOTHACHE ESSENCE); the latter is either suffered to evaporate spontaneously, or by a very gentle heat, until a soft extract is attained. *Used* to destroy the sensibility of the nerves of teeth, previous to plugging, and for toothache.

Extract of Pep'per. *Syn.* EXTRACTUM PIPERIS, E. P. NIGRI, L. *Prep.* 1. From decoction of black pepper (bruised). Stimulant; stronger tasted than the berries, but less aromatic.—*Dose.* 10 grs. to 1 dr.; in agues.

2. (Fluid; EXTRACTUM PIPERIS FLUIDUM, L.—Ph. U. S.) From black pepper, as FLUID EXTRACT OF CUBEBS—Ph. U. S., separating the PIPERINE by expression through a cloth, and keeping the fluid portion for use.

Extract of Pimpinel'la. *Syn.* EXTRACTUM PIMPINELLÆ, L. *Prep.* From the root of burnet saxifrage (*Pimpinella saxifraga*), as EXTRACT OF HOPS. Astringent.—*Dose.* 10 to 20 grs.

Extract of Pink'root. *Syn.* EXTRACT OF WORM GRASS, E. OF WORMSEED ROOT; EXTRACTUM SPIGELIÆ, L. *Prep.* 1. From Carolina pinkroot (*Spigelia Marylandica*), as EXTRACT OF BOX—P. Cod.—*Dose.* 5 to 20 grs.

2. (Fluid; ESSENCE OF PINKROOT, LIQUOR OF P.; EXTRACTUM SPIGELLÆ FLUIDUM, L.) Pinkroot, 1 lb.; proof spirit, 3 pints; make a tincture, evaporate to 10 fl. oz., add sugar, ¾ lb., and rectified spirit, q. s. to make the whole measure exactly a pint.—*Dose.* For a child, beginning with ½ a teaspoonful.

3. (Compound; COMPOUND LIQUOR OF PINKROOT; EXTRACTUM SPIGELIÆ FLUIDUM COMP., L.)—*a.* (Estlack.) Carolina pinkroot or spigelia (bruised), 4 oz.; senna, 3 oz.; savine, 1 dr.; pour on boiling water, 1 quart; when cold, add rectified spirit, ½ pint; digest 24 hours, express (or percolate), filter, evaporate to 12 fl. oz., in which dissolve, manna, 1 oz.; sugar, 8 oz. Every fl. oz. is equal to 2 drs. of pinkroot, and 1½ dr. of senna.—*Dose.* For a child, ½ to 1 teaspoonful; for an adult, a tablespoonful.

b. (W. Procter.) Pinkroot, 16 oz.; senna, 8 oz. (both in coarse powder); diluted alcohol (sp. gr. ·935), 2 pints; macerate for 2 days, then proceed by displacement, adding fresh spirit, until 4 pints have passed through; filter, evaporate to 20 fl. oz., and add carbonate of potassa, 1 oz.; next add oils of caraway and aniseed, of each, ½ dr.; (previously triturated with) powdered sugar, 24 oz.; lastly, apply a gentle heat to dissolve the sugar.

c. (EXTRACTUM SPIGELIÆ ET SENNÆ FLUIDUM—Ph. U. S.) As the last (nearly).—*Dose,* As above. All the above preparations of pinkroot are regarded as powerful and
thelmintics; particularly the last

Extract of Pipsis'sewa. See
WINTER-GREEN.

Extract of Poi'son Oak. *Syn.*
RHOIS TOXICODENDRI, L. *Prep.*
From the expressed juice of the
toxicodendron. Narcotic, stimul
rative. *Dose.* ¼ gr. to 1 gr.,
creased; in chronic rheumatism,
diseases, &c.

Extract of Pomegran'ate. *Syn.*
GRANATI, L. *Prep.* 1. (Soubeiran,
From the root-bark of pomegran
TRACT OF BOX. In tape-worm.—
20 grs.; followed by a purgative.

2. (E. G. CORTICIS FRUCTÛS, L.)
decoction of the fruit-rind. As the

Extract of Pop'pies. *Syn.* EXTRA
PAVERIS (B. P.), E. P. ALBI, L.
(B. P.) Capsules coarsely powdered,
tified spirit, 2; distilled water, a
mix the poppy capsules with 40 of
stirring them frequently during 24 ho
pack in a percolator, and pass wate
through them until about 160 have
though; evaporate the liquor by a w
to 20; when cold, add the spirit
24 hours, filter the liquor, and evap
pilular consistence.—*Dose.* 2 or 5 gr

2. (Ph. L.) Bruised poppy-heads (
the seeds), 15 oz.; boiling distilled
gal.; macerate 24 hours, boil to one half,
and complete the evaporation.

3. (Ph. E.) As the last, with "caps
quite ripe."

Obs. The medical action of extract
pies, for the most part, resembles
opium; but it is considerably weaker,
generally regarded as less prone to
headache and delirium.—*Dose.* 2 to 12 g
is usually prepared by the large manufact
by exhausting the capsules, by coction
water; hence the inferior quality of
tract of the shops, which contains a con
able quantity of inert matter.

The principal consumption of this extra
among the brewers, brewers' druggists,
wine merchants. For this purpose it is eva
rated until it becomes hard on cooling,
it is formed into half-pound rolls, and cov
with paper, like lead plaster. One of
rolls added to a hogshead of ale, stou
sherry, materially increases the 'headiness
apparent strength of these beverages.

Extract of Pota'to. *Syn.* EXTRACTUM
LANI TUBEROSI, L. *Prep.* (Dr. J. Lat
From the stem and leaves of the potato
as EXTRACT OF ACONITE—Ph. L. Nar
—*Dose.* 2 to 10 grs.

Extract of Pur'ging Flax. *Syn.* EXTRAC
LINI CARTHARTICI, L. *Prep.* (Dr. B. L
From the dried herb, as EXTRACT OF NO
Ph. L. Aperient and diuretic.—*Dose.* 5
grs.; 14 lbs. yielded 2¼ lbs. of extract.

Extract of Quassia. *Syn.* EXTRA

), Ex. q. lignі, L. *Prep.* 1.
scraped. 1 lb.; distilled water,
acerate the quassia in 8 oz. of
ours; pack in a percolator;
e quassia is exhausted; evapo-
re it becomes thick, and again
water bath to a proper consist-
Dose. 2 to 5 grs.

decoction of quassia chips.
5%.

rom the rasped wood, as ex-
oht—P. Cod. Bitter and sto-
5 to 10 grs., or more.

tract is almost universally pre-
n, and is principally consumed
, who employ it as a substitute
ge quantities. The bark is fre-
uted for the wood, but is con-
bitter. The Ph. Baden has an
ed with spirit of ·944.

uince Seeds. *Syn.* Extractum
c. seminum. *Prep.* From the
cked as a lozenge, in hoarseness,

Rhat'any. *Syn.* Extractum
e. krameriæ (B. P.), L. *Prep.*
atany in coarse powder, 1; cold
r, 15; macerate 24 hours in 2 of
en percolate the whole; evapo-
bath to dryness.—*Dose.* 5 to 20

Baden and U. S.) From dried
(*Krameria triandria*), as extract
-P. Cod.

r.) By two successive macerations
ater of 24 hours each, and evapo-
temperature not exceeding 165°

ract of rhatany is astringent and
e. 10 to 20 grs. A large quantity
act, of very inferior quality, is im-
Brazil, and other parts of South
It is kept in two states, hard and
former resembles kino, and is often
; the latter is chiefly consumed by
facturers and 'improvers' of port

of Rhu'barb. *Syn.* Extractum
P.), L. *Prep.* 1. (B. P.) Rhubarb
bruised), 8 oz.; rectified spirit, 5 oz.;
ater, 50 oz.; macerate 4 days, strain,
aside, that the fæces may subside;
at the clear portion, strain, mix, and
to a proper consistence over a water
60 F.

.L.) As extract of cinchona—Ph.
ly). "The extract is obtained of
lity by evaporation in a vacuum
gentle heat." The Baden formula is

This extract is usually prepared by
from inferior and damaged rhubarb,
t from the chests on purpose; hence
r quality of the extract of the shops.
de of good Turkey, or *even East*
barb, *it is a very valuable prepara*tion.—*Dose.* As a stomachic, 5 to 10 grs.; as a purgative, 10 grs. to ½ dr. It is seldom exhibited alone. *Product.* 50%.

3. (Fluid; Liquor of rhubarb, Essence of r.; Liquor rhei, Extractum rhei fluidum, L.)—*a.* (W. Procter.) Rhubarb (in coarse powder), 8 oz.; mix it with an equal bulk of coarse sand, and moisten it with dilute alcohol (sp. gr. ·935, = 13 u. p.) to form a pasty mass; in a short time introduce it into a percolator, shake it until uniformly settled, and cover it with cloth or paper; then pour on the rest of the spirit (the remainder of 2 pints) until the product has little odour or taste of the root; next gently evaporate the tincture to 5½ fl. oz., and add sugar, 5 oz., when the whole should measure 8 fl. oz.—*Dose.* 15 to 30 drops.

b. (Ph. U. S.) As the last, adding of oils of fennel and anise, of each, 4 drops; (dissolved in) tincture of ginger, 4 fl. drs.

4. (Compound; Extractum rhei compositum, E. panchymagogum, L.—Ph. Bor.) Extract of rhubarb, 3 drs.; extract of aloes, 1 dr., (softened with) water, 4 drs.; mix, and add of soap of jalap, 1 dr., (dissolved in) proof spirit, 4 drs.; lastly, evaporate to an extract, dry this in a warm place, and powder. Stomachic and purgative.—*Dose.* 4 to 20 grs.

Extract of Rue. *Syn.* Extractum rutæ, E. foliorum rutæ, L. *Prep.* 1. From rue leaves (*Ruta graveolens*), as extract of hops—Ph. L.

2. (Alcoholic—P. Cod.) As alcoholic extract of aconite—P. Cod. (nearly.) The formula of the Ph. Wert. is similar.

Obs. This extract is stomachic, carminative, and emmenagogue.—*Dose.* 10 to 20 grs., twice a day. It is usual to add a little of the essential oil to the extract, just before taking it out of the evaporating-pan, and when nearly cold. The first is the form adopted in trade in this country.

Extract of Saf'fron. *Syn.* Polychroite; Extractum croci, L. *Prep.* 1. From hay saffron, as extract of colocynth—Ph. L.

2. (P. Cod.) From the tincture. Superior to the last.

Obs. The first is used chiefly as a colouring and flavouring substance by cooks, confectioners, wine and cordial brewers, &c.—*Dose.* 5 to 15 grs.; as an excitant, antispasmodic, and emmenagogue.

Extract of Sarsaparil'la. *Syn.* Extractum sarzæ, E. sarsaparillæ, L.; Extrait de salsepareille. Fr. *Prep.* 1. (Ph. L. 1836.) From sarsaparilla, as extract of hops—Ph. L. The Ph. D. 1826 is similar.—*Dose.* 10 grs. to 1 dr. *Product.* (From Jamaica sarsaparilla) 32% to 36%.

2. (Alcoholic; Extractum sarzæ alcoholicum, L.)—*a.* From a tincture of the root-bark, prepared with proof spirit, either by digestion or percolation.

b. (*P. Cod. and* Ph. U. S.) From sarsaparilla root (powdered), as alcoholic extract of aconite—P. Cod. Superior to the aqueous extract.—*Dose.* 10 to 20 grs.

3. (Fluid; Liquor of sarsaparilla, Essence of s.; Liquor sarzæ, Essentia sarsaparillæ, Extractum sarzæ liquidum—Ph. L., E. s. fluidum—Ph. E. & D., L.); Extractum sarzæ liquidum—(B. P.) *a.* Jamaica sarsaparilla cut transversely, 16; distilled water (temp. 160° Fahr.), 280; rectified spirit, 1. Macerate in half the water for 6 hours, and decant the liquor; digest the residue in the remainder of the water for 6 hours more, mix the liquors, express and filter; evaporate by water bath to 7, or until it has a sp. gr. of 1·130; when cold add the spirit. Sp. gr. should be about 1·025.—*Dose.* 1 to 4 drs.

b. (Ph. L.) Sarsaparilla 3½ lbs.; distilled water, 3 galls.; boil to 12 pints, pour off the liquor, and strain whilst hot; again boil the sarsaparilla in water, 2 galls., to one half, and strain; evaporate the mixed liquors to 18 fl. oz.; and when cold, add of rectified spirit, 2 fl. oz. Each fl. oz. represents 2¾ oz. of the root (nearly).

c. (Ph. E.) Sarsaparilla, 1 lb.; boiling water, 4 pints; digest 2 hours, then bruise the root, boil it for 2 hours, filter, and express the liquid; repeat the coction with water, 2 pints, as before; evaporate the mixed liquors to the consistence of a thin syrup, and, when cold enough, add of rectified spirit q. s. to make up 16 fl. oz. Each fl. oz. represents 6 drs. of the root, and 6 fl. oz. of the decoction.

d. (Ph. D.) Sarsaparilla, 1 lb. (avoir.); proceed as before, and add of rectified spirit, q. s. to make the product up to 20 fl. oz. Strength, as the last (nearly). In the Ph. D. 1826 the decoction of sarsaparilla, 1 lb. (troy), was ordered to be evaporated to 30 oz., which with the spirit (2 oz.) made the preparation only half the strength of the present one.

4. (Compound; Extractum sarzæ compositum, E. sarsaparillæ comp., L.) There is no form for this preparation in the Pharmacopœias, but it is nevertheless in immense demand, from its great convenience in dispensing. The following formulæ are employed by one of the wholesale houses that does largest in this preparation:—

a. Guaiacum shavings (from which the small has been sifted), 30 lbs., Italian juice, 24 lbs., mezereon root, 6 lbs., are boiled with water, q. s., for 1 hour; the decoction is then drawn off, and the boiling repeated with fresh water a second and a third time; the mixed decoctions are allowed to deposit for 6 or 8 hours, or longer, and the clear portion decanted and strained through flannel; the liquid is now reduced to the consistence of treacle, when extract of sarsaparilla, 9 lbs., is added, and the evaporation conducted at a considerably lower temperature until near its completion, when the source of heat is removed, and the remain- oration conducted at the expense of that retained by the metal when nearly cold, and just b the extract to the 'pots' or 'ja of sassafras, 2 drs., dissolved in 1 quart, is added, and quickly stirred in. The *product* is article, if well managed, and 45 lbs., the precise quantity de quality of the juice employed. 'Ext. Sarzæ Comp.'

b. As the last, but only u juice, and that Solazzi. *Prod.* It is labelled and sent out a Co. Opt.'

c. By any of the forms give pound Decoction of Sarsa common or concentrated, by evaporation.—*Dose.* Same a simple extract.

5. (Fluid Compound; Com of sarsaparilla.)—*a.* From ceding formulæ by arresting t when the fluid has acquired th a thin syrup, and adding to c cold, rectified spirit, 4 fl. oz.

b. (Alcoholic—W. Hodgson. (bruised), 16 oz.; liquorice guaiacum wood (rasped), and (sliced), of each, 2 oz.; meze drs.; spirit, sp. gr. ·935 (=13 digest 14 days, express, filter, e fl. oz., add of sugar, 8 oz., and is dissolved, withdraw the h than the last.—*Dose.* 1 fl. dr.

c. (E. sarsaparillæ fluid As the last (nearly).

6. (From the root-bark; Ex ticis sarzæ, L.) From the de ture of the root-bark. The cor sarsaparilla yields fully 50% tract. "Five times as much lium." (Pope.)

Obs. Each of the above ex parilla (simple, fluid, and com of good quality, dissolves in wa deep reddish-brown solution, parent, and depositing little sed standing some days. See Sars

Extract of Scam'mony. S scammony; Resina scammonii licum, E. sive resina scam L. *Prep.* 1. From powdered hausted with proof spirit, and tincture distilled until little b over; the remaining water i from the resin, which is next boiling water and dried at a tem 240° Fahr. Brown; impure.

2. As the last, but using 90% or ether, and animal cha pure.

Obs. Scammony resin is tr ble, and combustible; and fre alcohol, ether, and oil of turp frequently adulterated with fraud readily detected by it enstrua.—*Dose.* 5 to 10 grs. or virgin scammony can be an unnecessary preparation."

urvy-grass. *Syn.* Extractum L. *Prep.* (P. Cod.) From ce of fresh scurvy-grass, by ex- n air. Anti-scorbutic, stimu- matic, and diaphoretic.—*Dose.* The valuable principles of the ated by much heat.

Sen'ega. *Syn.* Extractum *Prep.* 1. (P. Cod.) From ake-root (*Polygala Senega*), as ox—P. Cod.

nd; Extractum senegæ com- . et scillæ, L.—Ecky.) From squills and senega, as the last, acement. Both the above are pectorant, sudorific, and diuretic. 12 grs.

f Sen'na. *Syn.* Extractum *Prep.* 1. (Extractum sennæ)—*a.* As extract of colocynth

.) As extract of bistort—P.

r.) From senna leaves, by mace- pid water (104° Fahr.) for 24 xpression and filtration; the ope- peated with fresh water, and the iors evaporated to a thick extract 157° Fahr.), which is dissolved in ts, the solution filtered, and again —*Dose.* 10 to 20 grs. It is prin- as a basis for purgative pills. When r decoction it is nearly inert. A ct is prepared from the common de with proof spirit.

ölic; Extractum sennæ alco- .—Guibourt.) Senna (in powder). ified spirit, 5 parts; heat gradu- ing, let it cool; in 24 hours ex- , and repeat the process with fresh ly, distil and evaporate. Proof rs for this purpose.

; Extractum sennæ fluidum, . S.) Senna (in coarse powder), 2½ (at or near proof), 64 fl. oz.; mace- s, then act by displacement, sub- lding weak spirit (1 of rectified f water) until 10 pints of tincture .; evaporate to 1 pint, filter, add t., and oil of fennel, 1 fl. dr. (dis- ompound spirit of ether, 2 fl. drs. represents 1 oz. of senna.

f Smoke. *Syn.* Extractum fuli- *Prep.* 1. (Aqueous.) Wood-soot, r, 1 pint; boil to 16 fl. oz., filter, te.

.) Wood-soot, 2 oz.; distilled l water, of each, ½ pint; as the arly reputed antispasmodic, altern- Dose. 3 to 6 grs., 2 three times a spepsia, hysteria, *cancer, scrofula, syphilitical affections.*

Extract of Snake-root. See Extract of Senega.

Extract of Soap'wort. *Syn.* Extractum saponariæ, L. *Prep.* (P. Cod. & Ph. Bad.) From the dried roots of soapwort (*Saponaria officinalis*), as extract of bistort—P. Cod. Aperient and alterative.—*Dose.* 15 grs. to ½ dr.

Extract of Spruce. See Essence of Spruce.

Extract of Squills. *Syn.* Extractum scillæ, L. *Prep.* 1. (Aqueous; E. s. aquosum.—*a.* (Ph. Baden.) From squills, as extract of colocynth—Ph. L. (nearly).

b. (Ph. Bor.) From squills, as extract of senna—Ph. Bor. (nearly), but using boiling water, avoiding ebullition during the evaporation, and powdering the residuum.—*Dose.* 1 to 5 grs.

2. (Alcoholic; Extractum scillæ alcoholicum, L.—P. Cod.) From the tincture prepared with proof spirit, by distillation and evaporation.—*Dose.* ½ to 3 grs., as an expectorant and diuretic, twice or thrice a day. In larger doses it is nauseant and emetic.

Extract of Stor'ax. See Styrax.

Extract of Stramo"nium. *Syn.* Extract of thorn-apple; Extractum stramonii, (Ph. L. & D.), L. *Prep.* 1. (B. P.) Pack stramonium seeds, coarsely powdered, in a percolator, and pass about their own weight of washed ether slowly through them, remove the ether, and set aside. Now pour over them proof spirit until the seeds are exhausted; distil off the spirit, and evaporate the residue by a water bath to a proper pill consistence.—*Dose.* ¼ gr., gradually increasing.

2. (Ph. L.) Seeds of thorn-apple (*Datura stramonium*), 15 oz.; boiling distilled water, 1 gal.; macerate for 4 hours in a vessel lightly covered, near the fire; afterwards take out the seeds, bruise them in a stone mortar, and return them to the liquor; then boil down to 4 pints, strain whilst hot and evaporate. The Ph. D. is similar. *Product.* (About) 12⅝. Anodyne and narcotic.—*Dose.* ¼ gr. to ½ gr., gradually increased, twice or thrice a day; in neuralgia, rheumatism, tic douloureux, spasmodic asthma, epilepsy, worms, &c.

3. (P. Cod. & Ph. U. S.) From the expressed juice of the fresh leaves, heated to boiling, and filtered. The P. Cod. also orders it to be prepared as extract of aconite—Ph. L. Anodyne and narcotic.—*Dose.* ½ gr. to 1 gr.

Obs. On the large scale, this extract is prepared by expressing the juice of the fresh herb, and boiling the remainder in water; the juice and decoction are then mixed, filtered, and evaporated. 1¼ cwt. of stramonium yielded 37 lbs. of juice, and this, with the decoction, gave 31 lbs. of extract. (Gray.)

4. (Alcoholic; Extractum stramonii—Ph. E., E. s. alcoholicum, L.)—*a.* (Ph. E. & Ph. U. S.) From the seeds (ground in a coffee-mill), by percolation with proof spirit. *Product.* (About) 14⅝; 1 lb. yielded 2¼ oz. (*Recluz.*)

b. (P. Cod.) From the leaves, as EXTRACT OF ACONITE—P. Cod.—*Dose.* ¼ gr., gradually increased. (See *above.*)

Extract of Suc'cory. *Syn.* EXTRACTUM CHICORII, L. *Prep.* (Guibourt.) From the fresh root, as EXTRACT OF ACONITE—Ph. L. Aperient, deobstruent, and tonic.—*Dose.* 10 gr. to ½ dr.

Extract of Sweet Flag. *Syn.* EXTRACTUM ACIDI, E. CALAMI AROMATICI, L. *Prep.* From the rhizomes, as EXTRACT OF RHUBARB—Ph. L. See SWEET FLAG.

Extract of Tan'sy. *Syn.* EXTRACTUM TANACETI, L. *Prep.* 1. From the herb (*Tanacetum vulgaris*), as EXTRACT OF HOP—Ph. L.

2. (Giordano). As EXTRACT OF HOREHOUND—Ph. Lusitan.

Obs. This extract is said to be tonic, stomachic, anthelmintic, emmenagogue, and febrifuge. Dr. Clark says that in Scotland it was found to be serviceable in various cases of gout. The infusion is, however, preferable.—*Dose.* 5 grs. to 20 grs.

Extract of Tarax'acum. *Syn.* EXTRACT OF DANDELION; EXTRACTUM TARAXACI (Ph. L. & E.), E. T. HERBÆ ET RADICIS (Ph. D. 1826), L. *Prep.* 1. (B. P.), Crush fresh dandelion root, press out the juice, and allow it to deposit; heat the clear liquor to 212° F., and maintain the temperature for 10 minutes; then strain and evaporate by a water bath, at a temperature not exceeding 160° F. to a proper consistence.—*Dose.* 5 to 15 grains.

2. (Ph. L.) From the recent root of dandelion (*Leontodon Taraxacum*), as EXTRACT OF HOP—Ph. L. The formulæ of the Ph. E. & U. S. are nearly similar,

3. (Ph. D.) From the herb and root, as the other simple extracts (EXTRACTA SIMPLICIORA).

4. (P. Cod.) From the expressed juice, as EXTRACT OF STRAMONIUM—P. Cod.

5. (Ph. Bor.) As EXTRACT OF SENNA—Ph. Bor. (nearly).

6. (Ph. Baden.) By displacement with cold water,

7. (Wholesale.) From the decoction.

8. (Fluid.) See LIQUOR OF TARAXACUM.

Obs. The extract of the shops is usually prepared by exhausting the root by coction with water. The products of the first two of the above formulæ, when recent, have a faint and agreeable odour, and a sweet bitter taste; those of Nos. 4, 5, and 6, smell strongly of the recent root, have a pale and lively brownish yellow colour, and a bitter acidulous taste, without any trace of sweetness; that of the last one is devoid of odour, and possesses a coffee-brown colour, and a sweetish, burnt taste, not much unlike a solution of burnt sugar. The medicinal virtue of this extract is greatest when the aroma and bitter taste of the recent root is well developed; and when sweet, its efficacy as a remedy is impaired. (Squire.)

Taraxacum root should be gathered during
the winter months, when the qu
product is looked at; as then a
of the juice yields more ext
summer and autumn it possess
ness and aroma. 4 lbs. of jui
gathered in November and Dece
1 lb. of extract, while it took fr
of juice from the root, gathered
summer, to yield a like quanti
The herb yields by the evapora
pressed juice, about 5⅝ of extrac
to Mr. Jacob Bell, the average yi
of root is about 7½ lbs. ('Phar
446.)

Good extract of taraxacum sho
soluble in water.—*Dose.* 10 grs. t
resolvent, aperient, and tonic,
stomach complaints, &c.

Extract of Tea. *Syn.* EXTRA
L. *Prep.* 1. From an infusion
rougher kinds of black tea. Astr
been recommended in diarrhœa;
pills.—*Dose.* 10 grs. to ½ dr. A
looking substance, smelling and t
of tea, is imported under the sam
China.

2. (Pidding's.) The joint pro
tillation and infusion combined.
be made in China, and exporte
densed preparation of tea. (Ess
ESSENTIA THEÆ); to be used as
for the leaves, in order to save th
freight, &c.

Extract of Thorn-Apple. See
STRAMONIUM.

Extract of Tobac'co. *Syn.*
TABACI, E. NICOTIANÆ, L. *Pre*
pendale.) From decoction of to
posed as an external application
&c.

2. (Alcoholic; EXTRACTUM T
HOLICUM, L.—Ph. Bor.) Tobac
lb.; spirit (sp. gr. ·900), 2 lb.;
warm place for some days, expre
and again digest in a mixture o
spirit (·900), of each, 1 lb., fo
again press out the liquor, and e
strained and mixed liquors in
bath, at a temperature not exc
Fahr.

Extract of Tor'mentil. *Syn.*
TORMENTILLÆ, L. *Prep.* (Ph. A
the root of *Potentilla Tormentilla,*
OF HOPS—Ph. L. The Ph. Bade
preparation by displacement with
Astringent and febrifuge.—*Dose.*
in diarrhœa. It was formerly re
specific in syphilis. (Lindley.)

Extract of U'va Ur'si. See
WHORTLEBERRY.

Extract of Valer'ian. *Syn.*
VALERIANÆ, L. *Prep.* 1. From
as EXTRACT OF HOP—Ph. L.;
covered vessel.

2. (Ph. Bor. and Baden.) As
CINCHONA—Ph. L. (nearly), emplo

ssion of the liquor, and only
consistence of syrup.
al to add to this extract a
NTIAL OIL OF VALERIAN, dis-
quantity of rectified spirit,
ring it from the evaporating-
nearly cold. Anti-spasmodic
se. 10 grs. to ½ dr. In hys-
lic diseases. Valerian yields
extract.
EXTRACTUM VALERIANÆ AL-
—P. Cod.) As EXTRACT OF

TRACTUM VALERIANÆ FLUI-
. S). Rectified spirit, 12 fl.
valerian (in coarse powder),
nd percolate, adding, subse-
at or near proof) until 16 fl.
ave passed through; let this
aneously, in a shallow vessel,
5 fl. oz.; in the mean time
to the mass in the percolator,
nore of tincture are obtained,
e above residuum of the eva-
ng to dissolve any oleo-resinous
e rectified spirit, and to add it
ly, filter, and add of rectified
ake the whole measure 16 fl.

anil'la. See LIQUOR OF VA-

Vall Pel'litory. *Syn.* EXTRAC-
Æ, L. *Prep.* From fresh wall
taria officinalis), as EXTRACT OF
L. Aperient, diuretic, and
e. 10 grs. to ½ dr.

Wal'nut. *Syn.* EXTRACTUM
MATURÆ, L. *Prep.* 1. From
(*Juglans regia*), as EXTRACT OF
L.
e decoction of the green shells.
Dose. 20 to 30 grs. in cinnamon

Walnut Leaves. *Syn.* EXTRAC-
S FOLIORUM, L. *Prep.* 1. From
of dried walnut leaves.
m.) By displacement with tepid
horetic and alterative.—*Dose.*
rice or thrice a day; in scrofula,

lic; EXTRACTUM JUGLANDIS
OHOLICUM, L.—Ph. Bor.) From
(cut), as ALCOHOLIC EXTRACT
Ph. Bor. (nearly).

Wa'ter-dock. *Syn.* EXTRACTUM
ICI, L. *Prep.* From the root,
F HOPS, Ph. L. Astringent and
—*Dose.* 15 grs. to 1 dr.; in
c.

Whor'tleberry. *Syn.* EXTRACT
; EXTRACTUM UVÆ URSI. (Ph.
From the dried leaves of the
tostaphylos Uva-Ursi), as EX-
—Ph. L.—*Dose.* 5 to 15 grs.,
a day; in chronic diseases of
d kidneys, *attended with* increased secretion of mucus, without inflammation.

Extract of Win'ter Cher'ry. *Syn.* EXTRACTUM ALKEKENGI, L. *Prep.* From the berries of *Physalis alkekengi*, as EXTRACT OF ELDER. Aperient, detergent, and diuretic.—*Dose.* 2 to 4 drs.

Extract of Win'ter-green. *Syn.* EXTRACT OF PIPSISSEWA; EXTRACTUM CHIMAPHILÆ, L. *Prep.* From the herb winter-green or pipsissewa (*Chimaphila umbellata*), as EXTRACT OF HOPS—Ph. L. —*Dose.* 10 grs. to ½ dr.; in dropsy, scrofula, and chronic affections of the urinary organs.

Extract of Wood Sor'rel. *Syn.* EXTRACTUM ACETOSELLÆ, L. *Prep.* (Pideret.) From the expressed juice of the fresh herb (*Oxalis acetosella*). Acid, bitter, and antiscorbutic.—*Dose.* 15 grs. to ½ dr.

Extract of Worm Grass. See EXTRACT OF PINKROOT.

Extract of Worm'seed. *Syn.* EXTRACTUM CINÆ ÆTHEREUM, E. SEMINUM C. Æ., L. *Prep.* (Hamb. Cod. 1845.) Wormseed, 1 oz.; ether, 4 oz.; digest 3 or 4 days, press, filter, distil off 4-5ths, and evaporate the residuum to a proper consistence. *Prod.* 25% to 30%. Vermifuge.—*Dose.* 3 to 10 grs., night and morning, for 2 or 3 successive days, followed by a brisk purge.

Extract of Worm'wood. *Syn.* EXTRACTUM ABSINTHII; EXTRACTUM ARTEMESIÆ ABSINTHII, L. *Prep.* 1. (Ph. D. 1826.) From the dried flowering tops of wormwood, as the other simple extracts (EXTRACTA SIMPLICIORA—Ph. D.)

2. (Ph. Bor.) As EXTRACT OF RHATANY—Ph. Bor.

3. (P. Cod. & Ph. Baden.) By displacement by cold water.

Obs. Bitter stomachic, tonic, and vermifuge.—*Dose.* 10 grs. to 20 grs., 2 or 3 times daily; in dyspepsia, loss of appetite, gout, &c. It is usual to add a few drops of the oil of wormwood to the extract before taking it from the pan.

4. (Alcoholic; EXTRACTUM ABSINTHII ALCOHOLICUM, L.—Guibourt.) From a tincture prepared from the dried tops of wormwood boiled in proof spirit. More active than the last.

Extract of Yew. *Syn.* EXTRACTUM TAXI, L. *Prep.* 1. (Loder.) From the inspissated juice of the fresh leaves of the yew (*Taxus baccata*). Its action on the circulation greatly resembles that of digitalis, but is more manageable.—*Dose.* 1 to 7 grs.; in epilepsy, &c.

2. (Alcoholic,—Ph. Baden.) From the dried leaves, as ALCOHOLIC EXTRACT OF ACONITE—Ph. Baden.

Obs. In addition to the preparations given above, there are many others which are often called 'EXTRACTS.' These may be grouped under the following heads:—

Concentra'ted Extracts. *Syn.* RESINOIDS. Pharmaceutical preparations of more or less value, largely employed by the American physicians who style themselves 'ECLECTICS.' They are supposed to present in the most concentrated form the medicinal virtues of the plants from which they are derived. See RESINOIDS.

Flu'id Extracts. *Syn.* EXTRACTA FLUIDA, EXTRACTA LIQUIDA, L. This name has been applied in modern pharmacy to various preparations differing materially from each other in their degree of fluidity and concentration. Some of these have been already noticed, and others will be found under one or other of their synonyms. Much confusion would be avoided by confining the name 'FLUID EXTRACT' to those preparations only which differ from the ordinary officinal extracts in being in the liquid form; whilst others of a like character, but of less consistence or concentration, might be conveniently classed under the general denomination of 'LIQUORS' (LIQUORES, L.). The various condensed preparations of vegetable substances, now common in trade, professedly several times stronger than the common DECOCTIONS, INFUSIONS, and TINCTURES, might be simply and advantageously distinguished by the addition of 'CONCENTRATED' to their names. Tinctures made with rectified spirit, and of (say) at least 8 times the usual strength, might be appropriately termed 'ESSENCES.' See DECOCTION, ESSENCE, EXTRACT, INFUSION, OLEO-RESIN, SYRUP, TINCTURE, &c.

Extracts, Perfu'matory. See EXTRAIT.

Extracts, Pulver'ulent. *Syn.* DRIED EXTRACTS, DESICCATED E.; SACCHARATED E.; EXTRACTA PULVERATA, E. SICCA, E. CUM SACCHARO, L. *Prep.* 1. Ordinary soft extract of the drug, 4 parts; white sugar (in powder), 1 part; mix, and dry by exposure in a warm situation; lastly, reduce the mass to powder, and if it weighs less than 4 parts, triturate it with more powdered sugar until its weight is equal to the original weight of the extract used in its preparation. The strength of the extract thus continues unchanged.

2. (Ph. Bor.) As the last, but using powdered sugar of milk, in lieu of cane sugar.

3. (Gauger.) Alcoholic extract, 3 parts, rectified spirit, 1 part, are triturated together in a porcelain mortar until thoroughly incorporated, when white sugar (in powder), 15 oz., is gradually added, and the two carefully and completely blended together; the mixture is dried as before, and more sugar added until the whole weighs exactly 18 oz. Six grains represent one grain of the unprepared extract.

Obs. The above are admirable preparations, intended chiefly to render the perishable extracts of the narcotic plants (EXTRACTA NARCOTICA) less liable to suffer by age. See EXTRACT OF ACONITE (Saccharated), &c.

EXTRAC'TIVE. *Syn.* EXTRACTIVE PRINCIPLE. This substance was discovered by Fourcroy, and presumed by him to be the common basis of all extracts. It has since
been proved by Chevreul and
to be a heterogeneous compo
composition with the plant f
extracted. Extractive has a l
one becoming so in the air; i
fies, and becomes oxidized,
insoluble by long exposure to
peated solutions and evapo
unaltered state it is soluble
alcohol, is nearly insoluble
precipitated from its solutio
and metallic oxides. With
the basis of several brown dye

EXTRAIT. [Fr.] Liter
Among perfumers, extraits ar
ous solutions of the essentia
principles of plants and oth
stances. The French comm
term to any concentrated spi
or compound. In the shops
perfumers upwards of 60 pre
kind are distinguished by
extracts of JASMINE, JON
ORANGE BLOSSOMS, VIOLETS,
flowers of delicate perfume,
agitating and digesting the '
mades' of the flowers with th
spirit. in the manner describe
SPIRITS ('esprits'). This p
with fresh oil or pommade u
rendered sufficiently fragran
tracts (both simple and com
by the common methods of
tillation. See ESSENCE, EXT

EYE. In anatomy and phy
of vision. In order that vi
tinct, it is necessary that t
diverging from each point o
entering the pupil should conv
the retina. Near-sightednes
is due to the too great conve
'lens' or 'cornea,' causing
verge to a focus before reachin
spectacles worn by myopic p
cave glasses, which, by incr
gence of the rays falling up
the effect of carrying back ea
wards the retina. In the l
people ('PRESBYOPIA,' L.) th
fracted pencils are situated l
the 'lens' or the 'cornea' bein
convex. This defect is corr
glasses, which increase the c
incident rays. See BLI
BLINDNESS, VISION, &c.

Eye Drops. See WATER (

Eye Pow'ders. See COLLY

Eye Salve. See OINTMEN

Eye Snuff. See SNUFF.

Eye Waters. See WATER.

FACE A'GUE. The comm
intermittent form of facial
DOULOUREUX. See NEURAL

FACE PAINTS. *Syn.*

E, **Pearl White**, **Rouge**,

An exact imitation of an
traits and peculiarities. The
used in relation to copies of
, or of the handwriting of
: of interesting documents,
graving or lithography. See

. *Syn.* Factitius, L. Arti-
art, in distinction from that
ture. Numerous illustrations
on of this word occur in the
sent work.

:erement. In the *laboratory*,
or sediment deposited by a
FECATION.

Syn. Swooning; Syncope,
IMI, L. In *pathology*, a state
respiration and circulation are
pended for a time, or are ex-
. The symptoms are too well
ire description. The causes are
e—diminished energy of the
ganic affections of the heart
ng vessels. This has led noso-
vide syncope into two varie-

al (syncope occasionalis, s.
, L.), primitively induced by
violent emotions of the mind,
ra, derangement of the stomach
nstrained position of the body,
pressure, loss of blood, debility
&c. This variety is frequently
vomiting, and, occasionally, by
r epileptic fits. The recovery is
y the horizontal position, without
ng the least elevated, by which
lood is more vigorously thrown
in, and thereby stimulates it to
sual functions. Pungent sub-
ing-bottle, vinaigrette, &c.) may
o the nostrils, and cold water
the face and chest. In all cases
set, waist-band, neck-cloth, &c.)
tantly loosened, and indeed this
sistance which should be given,
ope or apoplexy. As soon as the
rallow, a little brandy-and-water,
few drops of ether or spirit of
ay be given.
(syncope cardiaca, L.), arising
ipparent cause, with violent pal-
ig the intervals, and altogether
midable character than the pre-
subsequent treatment must here
o the cure or alleviation of the
e.

The first and last runnings of the
The one is technically termed
faints;' the other, the 'weak
are both purified by rectification.
ILLATION.
, *Fienus remarks, that "faith* in the beneficial agency of remedies, and confidence in the skill of the medical attendant, are important adjuvants in the treatment of disease. To them both the physician and empiric owe part of their success."

FAL'LING SICK'NESS. See Epilepsy.

FAR'CY. See Glanders.

FAR'INA. The flour of any species of corn, pulse, tuber, or starchy root. The most important kinds of farina are noticed under their respective heads. The following dietetic articles of a farinaceous character are extensively advertised:—

Baker's Alimentary Compound. Fine flour (pastrycook's), 2 parts; finely ground rice, 1 part.

Baster's Compound Farina. Wheat flour, 14 oz.; white sugar, 2 oz.

Braden's Farinaceous Food. Similar to Hard's (*below*).

Bright's Nutritious Farina. Rice flour and potato starch, equal parts.

Bright's Breakfast Powder. Chocolate, 1 part; nutritious farina (Bright's) 2 parts.

Bullock's Semola. Wheat flour, from which a portion of the starch has been removed, so as to leave an excess of gluten.

Denham's Farinaceous Food. Wheat flour, 3 parts; barley meal, 1 part; the mixture is slightly baked, and again ground and sifted. Said to be slightly laxative.

Duryea's Maizena. Indian corn starch prepared for food.

Gardiner's Alimentary Preparation. Pure rice flour, very finely ground.

Hard's Farinaceous Food. Wheat flour, slightly baked, and resifted.

Kingsford's Oswego Prepared Corn. An excellent preparation of Indian corn.

Leath's Alimentary Farina. Wheat flour (baked), with some sugar, Indian corn meal, and tapioca. According to some, it also contains potato starch.

Maidman's Nutritious Farina. Potato starch tinged with beet-root or other pink colouring matter.

Plumbe's Farinaceous Food. South-sea arrow-root, with about 1-3rd its weight of pea flour.

Polson's Corn Flour. The starch of Indian corn or maize prepared with great care. It is much used as a substitute for arrow-root, and for custards, puddings, &c.

Smith's Nursing Farina. Equal parts of baked wheat flour and rice flour.

Obs. Many of the above compounds are deficient in the nitrogenous elements of nutrition, anl all of them nearly destitute of the mineral and saline matters which are absolutely necessary to the formation of the bones and tissues, and the support of the body in *health, and are consequently utterly unsuitable as an exclusive* article of diet, especially for young children. Unfortunately, it has been too much the fashion of medical men of late years to recommend these compounds, and even to furnish testimonials as to their excellence, apparently relying solely on the representation of their proprietors or vendors. We deem it, however, to be a public duty to caution parents and nurses against their injudicious use. As mere adjuvants or auxiliaries, when the natural food supplied by the mother may be insufficient for the nutrition of the infant, some of them may doubtless be of value; but in all other cases they should be largely combined with pure cow's milk, beef tea, meat broths or gravies, eggs, or other substances rich in the nitrogenous and saline elements of nutrition.

FARM'ING. The business or management of a FARM. Formerly farming was looked upon as a profession easily understood, and successfully pursued only by an empiric. It is now, however, regarded in a different light, and the farmer, to succeed, not only requires perseverance and observation, but also a sound knowledge of natural sciences. See AGRICULTURE, BUTTER, CHEESE, IMPLEMENTS, MANURES, SOILS, &c.

FASTING. See ABSTINENCE.

FAT. *Syn.* ADEPS, L. The fat of animals is a concrete oil contained in the cellular membrane of their bodies, more especially round the kidneys, in the folds of the omentum, at the base of the heart, upon the surface of the intestines, and among many of the muscles. Fat varies in consistence, colour, and odour, with the animal from which it is obtained. That of the carnivora is usually soft and rank-flavoured; that of the ruminantia solid and nearly scentless. It is generally whitest and most copious in the well-fed young animal, and yellowish and more scanty in the old. That under the skin and surrounding the kidneys (suet) is also more solid than that in the neighbourhood of the movable viscera. In the cetacea, or whale tribe, the fatty secretion assumes the form of oil. These variations in consistency depend upon the relative proportions of solid stearin and liquid olein present in the fat.

The vegetable fats are found in various parts of certain plants, but are generally most abundant in the seeds. They are extracted by simple pressure or else by boiling. Two kinds of vegetable fat, namely, palm-oil and cocoanut oil, are extensively employed in the useful arts.

All fats are lighter than water. They are all soluble in ether, benzole, and turpentine, and may be mixed with each other in any proportion.

In former times the fats of many animals were employed in pharmacy, but at present those principally used are lard and suet. In perfumery, in addition to these, beef marrow and bear's grease are employed. For both these purposes the crude material is cut into small pieces, and freed as much
from all extraneous membranes;
it is placed in a boiler with water,
until it is completely fused, when
strained, and allowed to cool very
this means a 'cake of cleansed fat
which may be readily separated
adhering water.

Fats and the fat oils are best
being run into glazed jars, and
the action of the air. A little
gum-benzoin, dissolved in them by
generally prevent, and in all
defer, the accession of rancidity.
duced this method into the labora
early days of manipulation, and
others to whom we have made it
since employed it with undeviating
in the manufacture of cerates,
other preparations containing fatty
the fixed oils. It has been
Griesler that nitric ether, and its
solution, act in the same manner. A
are not only sufficient to prevent
but, it is said, will even destroy the
odour of rancid fat. When heated
the alcohol, they immediately become
clear, and scentless. See OIL,
OLEIN, PALMITIN, STEARIN, TALLO
also *below*.

FAT'TY AC'IDS. In chemistry,
having acid properties derived from the
fats and oils. The radicals of these
in the natural fats combined with
called glyceryl. When fats are
an alkali, stearate, palmitate, and
potassa or soda, as the case may
produced and glycerin is set free.
composing either of these compounds
sulphuric acid a sulphate of the
formed, and the fatty acid is precipi
Some of the fatty acids, as stearic,
palmitic, and lauric, are solid at
temperatures; others, as oleic, are
The hard fatty acids are extensively
candle materials, being superior in every
spect to the natural fats from which they
derived.

FAT'TENING. Until comparatively a
date, the plan used to fatten domestic
was to prevent their taking exercise,
gorge them with food. The excessive
produced by these means was, however,
to be far from wholesome, and was less deli
than that arising in the natural way.
system was therefore gradually abandoned
favour of the present one, which consist
supplying the animal with abundance
wholesome food, and with the means of
exercise, as far as the disposition or feel
dictate. Hence the farmers "in the most
lightened districts, such as Berwickshire,
Lothian, &c., instead of tying up their fat
ing cattle in stables like horses, and
their food before them, put two or three
gether in small yards with sheds attached

run about, eat when they
shelter from the rain, or cold,
asure, under the open shed.
d in the same manner, and
s that are fattened for the
ry are no longer kept in
ned, or rabbits in hutches;
are allowed to take exercise
with various herbs, and the
a species of artificial warren,
take exercise by burrowing."

ugh fear is a depressing and
tion, and sometimes acts preju-
ealth, it frequently acts as a
entive of disease. It is a well-
at females who are the most
d desponding during the period
al, generally experience a more
nce than those who are more
solute. During the raging of
generally induces temperance,
the adoption of other precau-
ad powerfully to prevent dis-
re, according to Pereira, is said
ted the occurrence of epileptic
ht on by the sight of a person
a fit in the sight of the hospital
lirecting a red-hot iron to be
person who should next be

Ostrich feathers are those
as articles of personal decora-
feathers for beds; but the fea-
birds are commonly used for

e prepared for ornamental pur-
ring them with white soap-and-
to the pint), used hot; they are
ed in several successive portions
er, and after being drained and
lastly, passed through water
d with pure indigo, and dried out
When dry, the ribs are generally
a piece of glass, having a curved
for the purpose of increasing their
d the filaments are curled by
m between the edge of a blunt
he ball of the thumb of the hand
it.

Bleaching of:—
de has sprung up within the past
y which black, brown, or grey fea-
leached sufficiently to enable them
ny required colour.
ss is as follows:—The feathers are
ghly washed with soap-and-water, to
om any oil they may contain. They
ansferred to a bath composed of
of potash dissolved in water, to
been added a few drops of nitric or
cid. In this bath they rapidly lose
brown, or grey colour, and become
n. On being removed from this
re well rinsed in water, and are
be dyed, *even the most delicate*
colour. Great care is required in the process, as the flue of the feather is apt to be destroyed, if kept too long in the bath. A bleached feather may be readily known by the yellow colour of its stem.

Other methods have been adopted, such as a bath of chloride of lime or sulphurous acid, &c., but the bichromate bath gives the best results.

Black. By immersion for 2 or 3 days in a bath (at first hot) of logwood, 8 parts, and copperas or acetate of iron, (about) 1 part.

Blue. With the indigo vat.

Brown. By any of the brown dyes for silk or woollen.

Crimson. A mordant of alum, followed by a hot bath of brazil wood, and afterwards by a weak one of cudbear.

Pink or Rose. Wtth safflower and lemon juice.

Plum. The red dye, followed by an alkaline bath.

Red. A mordant of alum, followed by a hot brazil-wood bath.

Yellow. From an alum mordant, followed by a bath of tumeric or weld. Other shades may be obtained by a mixture of the above dyes.

Feathers may also be dyed by simple immersion, for two or three minutes, in a bath of any of the aniline colours.

Goose feathers for beds are generally purified by simply exposing them to the sun or in a stove until perfectly dry, and then beating them to remove loose dirt. When carelessly collected and dirty, they are sometimes first cleansed with lime water, or, better still, with a weak solution of carbonate of soda, or water to which a little solution of chloride of lime has been added; after which they are rinsed in clean water, and dried or stoved as before. Old feathers are cleansed or purified in the same way.

FEB'RIFUGES. *Syn.* Febrifuga, L. In pharmacy, substances or agents which cure or alleviate fever. The term is more particularly applied to medicines used against the ague, as cinchona bark and arsenious acid, and their preparations. The extreme value of cold water, as a drink in ardent fever, has been known in all ages. In 1723 Dr. Hancocke published a work entitled—'Febrifugum Magnum, or Common Water the best Cure for Fevers, and probably for the Plague,' which in a short time ran through several large editions, but appears to have been overlooked by the hydropaths of the present day.

FEC'ULA. *Syn.* Fæcula, L. The matter which subsides from cold water in which bruised or rasped vegetable substances have been washed. The fecula obtained from the seeds of the cereals and leguminosæ, and from *tuberous* or *bulbous* roots, consists of nearly *pure* starch. In some cases the starch is may be again washed by diffusion through clean cold water, and must be, lastly, collected, and dried out of the dust, and without artificial heat.

The fecula of narcotic plants for medicinal purposes is obtained by allowing the expressed juice to repose for 24 hours, and then decanting the clear portion, and drying the residue. Sometimes heat is employed. See ARROWROOT, STARCH, &c.

FEET (The). To preserve the feet in a proper condition, they should be frequently soaked, and well washed in warm or tepid water. The nails of the toes should be pared, soaked, and well washed in warm or tepid water. The nails of the toes should be pared, to prevent their becoming inconveniently long, and from growing into the flesh. Many persons suffer severely from TENDER FEET. This generally arises from the use of thin cotton or silk stockings, and boots or shoes that are either too tight or stiff, or not sufficiently porous to permit of the escape of the perspiration. Waterproof boots and shoes which are also air-tight (as those of gutta percha and India rubber), are common causes of tender feet, and even of headaches, dyspepsia, and apoplexy. The best treatment of tender feet is the immediate adoption of worsted stockings or socks, and light, easy shoes of buckskin, goatskin, or some other equally soft kind of leather. It is highly necessary for the preservation of health to preserve the feet DRY; persons who are, therefore, exposed to the wet, or who are frequently passengers through the public streets in bad weather, should regard sound and good boots and shoes as of the first importance. In fact, in a hygienic point of

ties, may also be frequently r
surgical operation.

FELT'ING. This is a
various species of fur, ha
blended into a compact tex
spects resembling cloth.
peculiar anatomical construc
stances enabling them to in
twine with each other, by w
permanently matted togeth
merly chiefly employed for
commonly used for mill-b
and when varnished or japa
with asphalte or bitumen,
stitute for japanned leather,

FENNEL. *Syn.* FŒNICU
The fruit (seed) of *Fœnicul*
fennel; the oil distilled fr
OF FENNEL; OLEUM FŒNICI
a distilled water (FENNEL WA
CULI, L.), are officinal in th
They are stimulant and car
now seldom employed.

FEN'UGREEK. The see
Fœnum Græcum. Resolven
The seeds dye yellow; for
coffee; now chiefly emplo
medicine.

FER'MENT. *Syn.* FER
substance which induces f
cording to one view fermen
whose decomposition procee
with that of the body und
phosis. They all contain al
tised principles, which in a n
and suffer decomposition.
teur, however, fermentatio

, and the temperature suffi-
it continues till the original
wholly destroyed. Substances
gen, on the contrary, require,
r undergoing this metamor-
ence of a nitrogenised sub-
n a state of putrefaction (fer-
iebig.) The substances which
ange are termed FERMENTS,
se the principal are gliadin,
albumen, and all nitrogenous
state of spontaneous decompo-
ation. “It is imagined that
stances, in the act of under-
re brought into contact with
compounds of small stability,
lecular disturbance of the body,
e of decomposition, may be, as
ated to the other, and bring
ruction of the equilibrium of
it owes its being. The com-
r these circumstances, breaks
products, which possess greater
(Fownes.) YEAST, the ferment
employed for inducing the
ation, is such a substance in
of putrefaction, and whose
ontinual motion. Putrefying
ces are equally capable of ex-
e action. “If we add to a so-
ugar an albuminous substance,
hy matter, the development of
manifest, and an additional
is found at the end of the ope-
with nourishment, ferment en-
nt. It is for this reason that a
ng must, added to a body of fresh
cites fermentation in the whole
effects are not confined to alco-
) fermentation. The smallest
ur milk, of sour dough, or sour
root, of putrefied flesh and blood,
alterations in fresh milk, dough,
root, flesh, and blood. But fur-
ich is a very curious circumstance,
a liquid containing any ferment-
another in a sound state, the
suffer decomposition under the
the former. If we place urea in
of beer-yeast, it experiences no
ile if we add it to sugar-water in
state, the urea is converted into
ammonia. We thus possess two
composition; the one direct, the
ct.” (Ure.)

markable circumstance connected
tation is that it is always accom-
the development of microscopic
isms—fungi and infusoria. “So
indeed, is this the case, that many
physiologists regard these organ-
existing cause of fermentation and
; and this view appears to be cor-
the fact that each particular kind
takes place most readily in
certain living organisms.”
(Fownes.) Thus the vinous or alcohol-producing fermentation is accompanied, or caused, by two fungi, called *Torula cerevisiæ* and *Penicillium glaucum*; the acetous or vinegar-producing fermentation by *Torula aceti*; the lactous fermentation (souring of milk) by *Penicillium glaucum*; &c. But whether fermentation is caused by a vital act of the fungi themselves, or by a peculiar state of the albuminous matter in which it occurs, is still an open question, owing to the many difficulties which surround investigations of this nature.

Fermentation or putrefaction differs from EREMACAUSIS or decay, in being limited to changes occurring in and beneath the surface of water, the effect being a mere transposition of elements, or a metamorphosis of the organic body. EREMACAUSIS, on the other hand, refers to the decomposition of moist organic matter, when freely exposed to the air, by the oxygen of which it is gradually burned and destroyed, without any sensible elevation of temperature. Although the presence of oxygen is essential to the commencement of this change, whenever fermentation is freely established it is no longer necessary, as it proceeds without the aid of any other substance external to the decomposing body, unless it be water or its elements. The entire absence of the exciting causes—warmth, air, and moisture—leaves even those substances which under ordinary circumstances are most liable to change, in a state in which they may remain for an almost indefinite period without perceptible alteration. Thus, animal substances in a frozen or dry state do not undergo decomposition, nor does a solution of sugar or the juice of grapes (must) when perfectly excluded from the air; but on the mere exposure of these substances to warmth, moisture, or atmospheric air, putrefaction or fermentation immediately commences. Remove the cork from the bottle of ‘capillaire’ on the parlour sideboard, or pierce the skin of one of the grapes on the dessert table with a needle, and these bodies, which would have otherwise suffered no change for weeks, or even months, will soon exhibit symptoms of spontaneous decomposition. The knowledge of this fact has been practically applied to the preservation of animal and vegetable substances for food. Even the most putrescible of these may be preserved for an unlimited period by enclosure in metallic cases, or glass bottles, from which the air has been completely removed and excluded.

The important duties which fermentation or putrefaction performs in the economy of our globe, and in several of the arts of life and civilisation, have long rendered the development of its principles an object of the highest interest and importance, both in a scientific and practical point of view. In its most extended sense, this subtile process of nature, *though occasionally* productive of injurious effects, may be regarded as one of the most necessary and beneficial with which we are acquainted. Like the labours of a scavenger, it speedily removes from the surface of our globe those matters which would otherwise remain for some time without undergoing decomposition. It either dissipates in air, or reduces to more fixed and useful forms of matter, those organic substances which, by their presence, would prove noxious, or, at all events, useless to the animal and vegetable kingdoms. It is the giant power that cleans the Augean stable of nature, at the same time that it provides some of the most esteemed articles of utility and luxury for the well-being and enjoyment of man.

Chemists have distinguished fermentation into different varieties, which, in general, are named after the more important products of its action. Of late years, the number of these varieties has been greatly increased by the extension of the term to several operations besides those formerly included under it. See ACETIFICATION, BREAD, PUTREFACTION, BREWING, &c.

FERN (Male). *Syn.* MALE SHIELD FERN; FILIX MAS, RADIX FILICIS, L. The root (rhizome) of the *Lastræa Filix-mas*, or male fern. It is bitter, astringent, or vermifuge. —*Dose.* 1 to 3 drs., in powder, or made into a decoction, repeated for 3 or 4 days, and followed by a purge. It is chiefly given in tapeworm. In Switzerland it is deemed almost infallible, but has proved less successful in these countries. See OILS.

FERRICY'ANIDE. *Syn.* FERRIDCYANIDE, FERRIDCYANURET. A compound of ferricyanogen with a metal or other basic radical. The FERRICYANIDE OF POTASSIUM, or 'RED PRUSSIATE OF POTASH,' as it is often improperly called, is a well-known example. The ferricyanides of AMMONIUM and the ALKALIES and ALKALINE EARTHS are soluble; those of most of the METALS, insoluble. See *below.*

FERRICYAN'OGEN. *Syn.* FERRIDCYANOGEN, FERRIC-CYANOGEN. The peculiar salt-radical which exists in the so-called red prussiate of potash. It is isomeric with ferrocyanogen, from which it differs in capacity of saturation (being tribasic), and in the behaviour of its compounds with solutions of the metals. It has not been isolated. See POTASSIUM (Ferricyanide).

FERROCY'ANIDE. *Syn.* FERROCYANURET, PRUSSIATE; FERROCYANIDUM, FERROCYANURETUM, L. A compound of ferrocyanogen with a metal or other basic radical. The principal substance of this kind is the FERROCYANIDE OF POTASSIUM or 'YELLOW PRUSSIATE OF POTASH,' as it is often called. See the respective bases—AMMONIUM, POTASSIUM, SODIUM, &c., and *below.*

FERROCYAN'OGEN. *Syn.* FERROCYANOGENIUM, L. A bibasic salt-radical, composed
of the elements of 3 equival
GEN and 1 equivalent of the m
has never been isolated. It u
various bases to form FERROCY
CYANOGEN, HYDROFERROCYANIC
&c.

FERRU'GO. [L.] Rust of iro
(Sesquioxide).

FE'VER. *Syn.* FEBRIS, PYR
pathology, a condition characteri
appetite, thirst, languor, debility,
ness to move, accelerated pulse, i
of surface, and general disturbanc
functions. A large number of
which all or some of these symp
are called FEVERS. They have b
by nosologists into intermittent (
TENTES), remittent (REMITTENTES),
tinued fevers (CONTINUÆ). The fi
are generally known as AGUES;
differ from agues in there being
marked exacerbations and remissi
symptoms, every 24 hours, but wi
entire intermission. The terms 'hec
vous,' 'bilious,' 'inflammatory,' &c., h
been applied to particular varieties
and names indicative of certain cut
pearances connected wiih them have b
to others; as 'scarlet' fever, 'yellow'
&c.

The usual symptoms of incipient f
brile symptoms) are—chilliness (varyi
a simple shiver to a sensation of col
running down the back), a quick p
and dry skin or flushing, languor, often
by yawning, depression of spirits, alter
of shivering and heat, hurried and un
spiration, flying pains in various parts
body, as the head, back, and loins;
appetite, nausea or vomiting, dry mouth,
tongue, costiveness, urine small in q
and usually of a deep colour, &c. Wh
of these symptoms appear, their progr
often be arrested by the timely exhibi
an emetic, followed by a saline purgati
diaphoretics; at the same time promoti
action of these remedies by a low di
drinking copiously of diluents, and ca
avoiding animal food, spirits, fermented li
or anything at all stimulant. Whenever
toms of fever become established, medic
vice should be sought and implicitly fol
In parts where it cannot be obtained the
ment recommended under AGUE, INFLA
TION, REMITTENT FEVER, and TYPHUS,
be followed with advantage.

In visiting or attending persons labo
under fevers, it is advisable to avoid imme
contact with them or their clothing, or s
ing near them in such a position as to i
their breath, or the effluvia evolved (in
cases) by their bodies; and when rema
for some time in the apartment, it is pref
to sit or stand near the fireplace, or bet
the window and door, as such parts o
room are generally better ventilated than

The greatest purifier of the
sick chamber is a good fire,
as a continual current of the
chimney, and a correspond-
air from without. Chloride
de of zinc, or their solutions,
rifiers. The first, however,
d in quantity, as the evolved
that case impede the respi-
tient. It is also advisable to
e room of a patient labouring
diseases of any class when
npty, or the spirits depressed;
recommended to clear the
va immediately after quitting
ee Ablution, &c.

ps. **Fibrine.** An azotized
ng the coagulable portion of
d, and the principal consti-
scular or fleshy parts of ani-
inently nutritions, and capable
the animal body albumen,
e tissues derived from them.

is easily obtained in a nearly
agitating or beating newly
ith a small bundle of twigs,
itself to the latter under the
ddish filaments, which become
ked with the hands in a stream
It may also be procured by
agulum of blood, tied up in a
ater, until all the soluble por-
ed. A small quantity of fat,
contains, may be removed by
ther.

Pure fibrin occurs as long,
filaments, which are tasteless,
insoluble in both hot and cold
d with acetic acid, it forms,
a transparent jelly, which is
in pure water. Very dilute
caustic alkalies dissolve it com-
new solution greatly resembles
. Dried by a gentle heat, it
of water.

Ficus (B. P., Ph. L. E. & D.),
fructus, L. The figs of com-
dried fruit of *Ficus Carica*, the
e. They are demulcent, emol-
and pectoral. Roasted and
occasionally employed as poul-
ils and other affections of the

Syn. **Filberd.** The fruit of
hazel or nut-tree (*Corylus Avel-*
ts are distinguished from com-
their lengthened figure and
The best are imported from

e manufacture of these articles
within the limits of this work.
er, be useful to mention that
, and rasps, which 'cut dull'
it, or being *much worn, are*
by being kept wet, immersed in water for some hours, or even for a day or two.

FIL'TER. *Syn.* Filtrum, L. An instrument or apparatus for straining or filtering liquids.

FIL'TERING POWDERS. *Prep.* 1. Fuller's earth washed, dried without heat, and reduced to coarse powder.

2. From pipe clay or potter's clay, as the last. Both the above are used to filter and bleach oils.

3. From clay or fuller's earth, 1 part; fine siliceous sand, 2 parts; the two are separately washed, after which they are drained, and mixed together, and dried, as before. *Used* for glutinous oils.

4. Granulated animal charcoal, sifted and fanned from the dust. *Used* to filter and bleach syrups and vegetable solutions.

Obs. Filtering powders are prepared of several degrees of coarseness, and should be chosen with reference to the degree of fluidity of the liquid to be filtered through them. In no case should they be reduced to fine powder, as not only is the process of filtration thereby rendered unnecessarily tedious, but in some cases (as when charcoal dust is mixed with glutinous vegetable solutions and syrups) the filtrate carries off a portion of the powder, which can afterwards be separated from it only with considerable difficulty. See Charcoal, Filtration, Oil, &c.

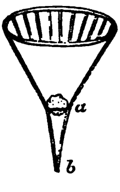
FILTRA'TION.' *Syn.* Filtratio, L. The separation of liquids from substances mechanically suspended in them, by passing them through media having pores sufficiently fine to retain or keep back the solid matter. Filtration is one of the most common and useful of the chemico-mechanical operations of the arts, and its successful performance in an economical and expeditious manner is therefore a matter of the highest importance in the laboratory, and, indeed, in almost every branch of human skill and industry, in which liquids are employed. Simple in principle, and apparently easily performed, it is, nevertheless, one of those operations which require no less of care than of tact and experience to conduct it with certainty and success. The losses sustained in the laboratory, by defective manipulation in this particular, often exceed those arising from ignorance and accidents in every other department conducted in it.

Filtration is usually resorted to for the purpose of freeing liquids from feculence, dirt, and other foreign matter, and for obtaining them in a clear or transparent state; but, in some cases, it has for its object the collection of the suspended substances, as precipitates, &c., and in others both these intentions are combined. The word 'filtration' is absolutely synonymous with 'straining,' but in the language of the laboratory it is usually applied to the operation of rendering liquids transparent, or nearly *so, by passing* them through fine media, as *filtering paper*, sand, and the like; whilst the term 'straining' is employed to designate the mere separation of the grosser portion, by means of coarse media, flannel, horsehair cloth, &c., through which they flow with considerable rapidity. Filtration is distinguished from 'clarification' by its mere mechanical action, whereas the latter operates by depuration, or the subsidence of the suspended substances or fæces, arising from their gravity being naturally greater than the fluid with which they are mixed, or being rendered so by the application of heat, or by the addition of some foreign substance.

The apparatus, vessels, or media, employed for filtration, are called 'FILTERS,' and are technically distinguished from 'STRAINERS' by the superior fineness of their pores.

Both strainers and filters act on the same principles as the common sieve on powders; they all, in like manner, retain or hold back the coarser matter, and permit the liquid or smaller and more attenuated particles to pass through. The term 'medium' (plural 'media') is applied to the substance or substances through the pores of which the liquid percolates.

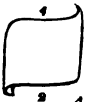
The forms of filters, and the substances of which they are composed, are various, and depend upon the nature of the liquids for which they are intended. On the small scale, funnels of tin, zinc, copper. wedgwood-ware, earthenware, glass, or porcelain, are commonly employed as the containing vessels. (See *engr.*) The filtering medium may be any substance of a sufficiently spongy or porous nature to allow of the free percolation of the liquid, and whose pores are, at the same time, sufficiently small to render it limpid or transparent. Unsized paper, flannel, linen, calico, cotton wool, felt, sand, coarsely powdered charcoal, porous stone, or earthenware, and numerous other substances of a similar kind, are employed for this purpose.



For many liquids that filter easily, and in which the suspended matter is of a course and porous nature, it is often sufficient merely to place a little cotton wool or tow, or a small piece of sponge, in neck of the funnel, as at (*a*) in the above engr.; but such an apparatus, from the small extent of the filtering surface, acts either slowly or imperfectly, and soon gets choked up. Filters of unsized paper are well suited for all liquids that are not of a corrosive or viscid nature, and are universally employed for filtering small quantities of liquids in the laboratory. A piece of the paper *is taken* of a size proportionate to the quantity

of the liquid to be filtered, and
from corner to corner into
engr.), which is again doubled
triangle, and the angular
margin being rounded off
scissors, it constitutes a pape
placed on a funnel of proport
and is then nearly filled with
piece of paper so cut, when
the table, should be nearly c
ing paper is now sold ready
various sizes, which simply r
for use. Another method of
filter, preferred by some perso
the paper once, as above (
then to fold it in a similar way
a fan, observing so to open it
lay it on the funnel that a su
cient interval be left between
two to permit of the free pass
of the filtered liquid on its desc
towards the receiver. The 'p
thus formed, is exceedingly us
purposes; it exposes the entire
paper to the liquid, and allo
proceed more rapidly than a 'p
(See *engr.*)

1



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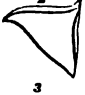

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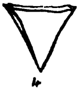

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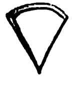


In reference to funnels, it m
that those employed for fi
should be deeply ribbed on the
rods of wood or glass, or pie
quills, should be placed betwee
paper. The neck or tubular pa
should, in like manner, be de
fluted on the outside, to perm
passage of the air, when it is
row-mouthed bottle or receive
is not the case, filtration proce
and the filtered liquid is apt t
the outside of the neck of the
confined air, and to be continua
flowing over the mouth of th
breadth of a funnel, to filter
about three fourths its height,
the throat (*a*). When deeper
liable to be continually ruptured,
sure of the superincumbent flu
shallower, filtration proceeds s
unnecessarily large surface of t
posed to the atmosphere, and
poration. To lessen this as mu
the upper edge of the glass
ground perfectly smooth, and a
plate-glass is laid thereon. Wh
are of large dimensions, or employ
fluids that rapidly soften the
paper, or for collecting heavy p
tallic precipitates, it is usual to
on linen or calico, to prevent t
This is best done by folding the
the paper, and cutting the filt
two, in the same way as would
doubled paper, observing so to
funnel that the paper and c
main close together, especially
bottom.

f small quantities of liquid, s in chemical experiments, ay often be conveniently erformed by merely placing he paper on the circular top of a recipient (see *engr.*), or on a ring of glass or earthenware laid on the top of any suitable vessel. A filter of this kind that will hold one fluid ounce will filter many liquids in an hour.

g paper should contain no soluld should not give more than ts weight of ashes. The soluble e removed by washing it, first, ute hydrochloric acid, and se- istilled water.

g a larger quantity of a liquid conveniently managed with a so for substances that are either too much loaded with feculence a to pass freely through paper, made of flannel, felt, tweeled or Canton flannel, linen or spended to iron-hooks by rings commonly employed. The first bove substances are preferable es, mucilaginous, and acidulous third for oily ones; and the remainder for tinctures, weak alkaline lyes, and similar solutions. These bags have the disadvantage of sucking up a considerable quantity of the fluid poured into them, and are therefore objectionable, except for large quantities, or when they are to be continued in actual use as filters for some time. On the large scale, a number of them are ded together, and are generally cases to prevent evaporation, and dirt from the filtered liquor that n their sides. These arrangements ed further on.

s mode of filtering aqueous fluids, not injured by exposure to the air, is to draw them off from one vessel to another, by means of a number of threads of loosely twisted cotton or worsted, arranged in the form of a syphon. (See *engr.*) The little cotton performs the operations of de- and filtration. This method is often for sucking off the water from a ity of a precipitate.

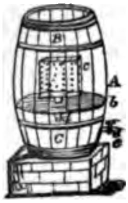
substances, as porous stone or , are used as the media for fil- of metal, wood, or stone-ware, to contain them and the super- . In these cases the filtering usually arranged as a shelf *or dia-* *divides the vessel into two com*partments; the upper one being intended to contain the dirty liquid, and the under one to receive the same when filtered. Such an apparatus is set in operation by merely filling the upper chamber, and may at any time be readily cleared out by reversing it, and passing clean water through it in an opposite direction. Small arrangements of this kind, intended to be screwed on to the water supply-pipe by either end, and which answer the purpose intended in the most satisfactory manner, have been manufactured and vended under the name of 'REVERSIBLE' or 'SELF-CLEANING FILTERS.' When pulverulent substances, as sand, coarsely powdered charcoal, &c., are employed, a similar arrangement is followed; but in this case the shelf or diaphragm must consist of any convenient substance pierced with numerous holes, over which must be placed, first a stratum of coarse pebbles, next some of a finer description, and on this a proper quantity of the sand, charcoal, or other medium. Over the whole should be placed another layer of pebbles, or a board or plate of metal or earthenware, pierced with a number of holes, to allow the liquid to be poured into the filter without disturbing its arrangement. Apparatus of this kind, of a permanent description, and arranged for filtering large quantities of liquids, are properly denominated 'FILTERING MACHINES.'

Among the liquids usually submitted to filtration, the following may be mentioned as the principal—water, oils, syrups, tinctures, vegetable juices, infusions, and decoctions.

The filtration of water may now be considered. The water of our wells is presented by nature ready filtered to the hand of man, and often exhibits an admirable degree of transparency and purity. It acquires this state by percolating through the mineral strata of the earth, which deprive it of the organic matter it derives from the soil and subsoil, but, at the same time, it dissolves a portion of the saline and earthy media through which it passes, and hence acquires that peculiar 'hardness' which is constantly found in spring water. On the large scale, this natural system of filtration has been imitated by some of the commercial companies that supply our cities and towns with water. Extensive beds of sand and gravel have been employed, with variable success, as the filtering media; and were it not that filters gradually lose their porosity by the accumulation of the retained matter in their pores, such a method would be excellent. But the great expense of such filters precludes the possibility of frequently cleaning or renewing them, by which means they can alone be kept in an efficient state.

A filter which possesses the advantages of being easily and cheaply cleaned when dirty, and which frees water from mechanical impurities *with immense* rapidity, may be formed *by placing a* stratum of sponge between two perforated metallic plates, united by a central screw, and arranged in such a manner as to permit of the sponge being compressed to any required degree. Water, under gentle pressure, flows with such rapidity through the pores of compressed sponge, that it is said that a few square feet of this substance will perfectly filter several millions of gallons of water daily. This method of filtration has been made the subject of a patent, and has been favorably noticed by the legislature.

A few barrels or hogsheads of water may be easily filtered daily, by the arrangement represented in the engraving.



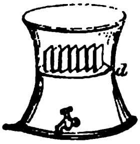
A. A common water-pipe or cock.

b. A false bottom fitting in perfectly water tight.

c. A perforated wooden or metallic vessel or box covered with a bag of felt or other filtering substance (not shown in the engraving). *d*. A small tube, fitting water-tight into the false bottom, and uniting the *interior* of the filter with the lower portion of the cask.

It is evident that when water is poured into the upper portion, *B*, of a vessel so arranged, it will sink through the filter *c*, and pipe *d*, into the lower chamber *C*, and this filtration will go on as long as the supply continues, and water is drawn from the cock *e*. By uniting the cock *e* with a tank or casks, and by keeping the upper portion *B* always full by means of a ball-cock, a considerable quantity of water may be thus filtered. The advantage of this plan is, that the filter *c* can be always readily got at, and easily cleaned or renewed.

For filtering water on the small scale, and for domestic use, 'alcarazzas,' diaphragms of porous earthenware and filtering-stone, and layers of sand and charcoal, &c., already referred to, are commonly employed as filtering media.



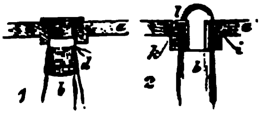
The filtering power of porous stone or earthenware may be greatly increased by adopting the arrangement represented in the margin, which consists in making the diaphragm of the shape of a disc (*d*), supporting plates of the same material, the whole forming but one piece. The 'PLATYLITHIC WATER-FILTERS,' which are formed of porous stone cut on this plan, present 200 to 300 square inches of filtering surface. The 'PORTABLE FILTERS,' set up in stone-ware, that are commonly sold in the shops, contain a stratum of sand, or coarsely-powdered charcoal; before, however, having access to this, the water has to pass through a sponge, to remove the coarser portion of the impurities. Among the many new kinds of portable filters now offered for sale are two which claim special notice, viz.,

the 'MOULDED CARBON FILTER,'
spherical or cylindrical vessel f
pressed carbon; and the 'SILI
FILTER,' in which the medium
substance, formed of animal ch
ashes of Boghead coal.

Oils are filtered, on the small
cotton-wool, or unsized paper,
a funnel; and on the large scal
bags, made of tweeled cotton-
flanne
are
about
ches i
from
(see
inclos
less c
of
about
inche
for t
cond
exten
surface into the smallest pos
number of these double bags (
60) are connected with corre
in the bottom of a block-tin o
cistern, into which the oil t
poured. The mode in which
fastened to the cistern is of
portance, as on the joint being
depends the integrity of the ap
methods of doing this are figu
graving, which, with the refe
plain themselves, the same lett
the same parts of each.

Filtering-bag of cotton-cloth.

Cotton filtering-bag, 'creased,' or closed in its canvas envelope, ready for fixing.



a. Bottom of cistern.
b. Filtering-bag.
c. Screw of the conical nozzle fitting
d. Binding cord connecting bag and
e. Binding cord connecting bag and
f. Bayonet-catch, connecting the lo
nozzle fastened to the bag with th
part, *g*.
i. The thick hem at the top of the b
large by enclosing a piece of thick co
on the shoulders, *k*.
l. A metallic cylinder, loosely fitti
cistern, and over which the top of
before being put into its place; whe
engraving, it retains the hem *i* secure
the shoulder *k*.

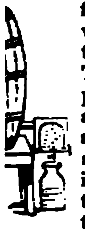
The second of the above
the least expensive, and cert
convenient in practice; and
linder *l* fits the hole closely (
bag), is as safe, or safer, tha
screw.

The bags are surrounded by
fitted up with doors for the

:; and the bottom of the apart- sed with large steam-pipes, by r temperature may be kept up er. The use of heat should, r be had recourse to when it , as although it vastly increases ltration, the oil so filtered is ecome opaque in cold weather e process is conducted at the ature of the atmosphere. This ' the case with castor oil and the United States of America, ter is consumed in enormous illumination, the best is always ed,' as it is popularly called. In more convenient to have a all cisterns at work (say 50 or), than one or two larger ones; t that may occur is more easily that without stopping the whole

n-cloth bags are employed with- reased,' or enclosed in others of hould not be longer than about nd not wider than about 5 or 6 filled. When larger they are

mt method of filtering a single , to insert the pipe of a two-way into the cork-hole, by which means the whole will be filtered as drawn off, without any trouble on the part of the operator. This filter consists of a porous bag stretched over a perforated metallic vessel, nearly the shape and size of the exterior casing, and its edge is tightly screwed between the sides and bottom of so as to be quite water-tight. ommunicates with the interior of ed plate and filter, and the supply- he exterior. By this means the mber, which occupies ⅚ths of the ly fills with filtered oil, and con- s long as any liquor remains in This arrangement is also well the filtration of wines, beer, orter, and various other liquors. ualled in simplicity and useful- same filter may be removed from k, with the facility of a common

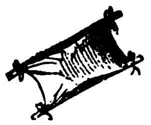


ration of SYRUPS is now generally the large scale by passing them e 'GREASED BAG FILTER' just de- n the small scale, as employed by s and druggists, they are usually gh CONICAL FLANNEL BAGS. (See) The filtration of thick syrups is, ttended with some difficulty, and s a good plan to filter *them in a ilute state, and afterwards to* reduce them to a proper consistence by evaporation in clean vessels of tinned copper, by steam heat. Syrups, when filtered in a heated state, run well for a time, but the pores of the fabric rapidly get choked, from the thickening of the syrup and partial crystallization of the sugar, occasioned by the evaporation of the aqueous portion from the surface of the bag. This may be partially prevented by enclosing the bag in a metallic casing. On the whole, clarification is preferable for syrups to filtration, on the small scale. They need only be well beaten up while cold with a little white of egg, and then heated; a scum rises, which must be removed as soon as it becomes consistent, and the skimming continued until the liquid becomes clear. Any floating portions of scum that may have escaped notice are easily removed by running the syrup through a coarse flannel strainer, whilst hot. The most extensive application of the process of filtration in the arts is in the refining of sugars.

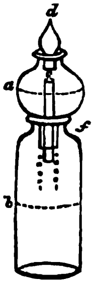
TINCTURES and DILUTE SPIRITS are usually filtered, on the small scale, through BIBULOUS or UNSIZED PAPER placed on a funnel; and on the large scale, through thin and fine COTTON BAGS. In general, however, tinctures clearify themselves by the subsidence of the suspended matter, when allowed to repose for a few days. Hence it is the bottoms alone that require filtering; the supernatant clear portion need only be run through a small hair sieve, a piece of tow or cotton placed in the throat of a funnel, or some other coarse medium, to remove any floating substances, as pieces of straw, &c. Spirits which are largely loaded with essential oil, as those of ANISEED, &c., run rapidly through paper or calico, but usually require the addition of a spoonful or two of magnesia before they will flow quite clear. When possible, tinctures, spirits, and all similar volatile fluids, are better and more economically cleared by subsidence or clarification than by filtration, as, in the latter way, a portion is lost by evaporation, and the strength of the liquid is thereby altered.

Vegetable juices should be allowed to deposit their feculous portion before filtration. The supernatant liquid will then be often found quite clear. It is only when this is not the case that filtration should be had recourse to. A small quantity may be filtered through coarse or woollen filtering paper, supported on a piece of coarse calico placed on a funnel; when the quantity is large, one of the CONICAL BAGS before described should be employed. The bottoms from which the clear portion has been decanted should be placed on a separate filter, or else not added until the whole of the other portion has drained through. Vegetable juices are often rendered clear, by simply heating them to about 180° or 200° Fahr., by which their *albumen is coagulated*; they are also frequently *clarified by the addition* of a little white of egg and heat, in the same way as syrups. Many of them (as those of hemlock, henbane, aconite, &c.) are greatly injured by heat, and must consequently be filtered, or only simply decanted after repose. In all cases they should be exposed to the air as little as possible, as they rapidly suffer decomposition.

Vegetable infusions and decoctions may be cleared by defecation followed by filtration. The conical bags of flannel before described are usually employed for this purpose. When the liquid is to be evaporated to an extract, they are commonly suspended by a hook over the evaporating pan. A convenient method of straining these fluids, practised in the laboratory, is to stretch a square of flannel on a frame or 'horse,' securing it at the corners by pieces of string. (See *engr.*) Such a frame, laid across the mouth of a pan, is more easily fed with fresh liquid than a bag, whose mouth is 40 or 50 inches higher. The same purpose, for small quantities of liquid, is effected by laying the flannel across the mouth of a coarse hair sieve. The concentrated infusions and decoctions, being usually weak tinctures, may be filtered in the same way as the latter. (See *above*.) Many vegetable solutions, that from the viscidity of the suspended matter can scarcely be filtered, may be readily clarified with white of egg in the cold, or pass the filter rapidly if a very small quantity of acetic, tartaric, sulphuric, or other strong acid, is previously added.



Corrosive liquids, as the STRONG ACIDS, are filtered through powdered glass, or SILICEOUS SAND, supported on pebbles in the throat of a glass funnel, or through asbestos or gun-cotton placed in the same manner. Charcoal has also been employed for the same purpose, but is not fit for some acids. Strong caustic alkaline lyes are also filtered through powdered glass or sand. Weak alkaline lyes may be filtered through fine calico, stretched across the mouth of a funnel. Many corrosive liquids, as solution of potassa, &c., require to be excluded from the air during filtration. The simplest apparatus that can be employed for this purpose is that figured in the margin:—(*a*) is a globular bottle fitted with the ground stopper (*d*), and having a perforated neck (*f*) ground to the bottle (*b*); (*c*) is a small tube, wrapped round with as much asbestos, linen, or calico, as is required to make it fit the under neck of the bottle through which it passes. The tube (*c*) may also be fixed by placing pebbles and powdered glass or sand round
it, as before mentioned. For us
to be filtered is poured into t
nearly as high as the top of th
the stopper is replaced. Th
descends into (*b*), and a simil
air passes up the tube into (
POTASSÆ may be always obt
depuration in close vessels, whe
of lime only need be filtered, w
effected with calico fixed across
a funnel.



When a precipitate, or t
matter in a liquid, is the objec
tion, the filter should be of such
the powder may be easily sepa
when dry, and that with the leas
Linen filters are for this reas
for large quantities, and tho
bibulous paper for small ones.
should be washed down the side
and collected, by means of a sm
water, in one spot at the bot
the operation with a camel-hai
when the whole is dry, it sho
off the paper or cloth with a
or brush, and not removed by
is commonly done, when it ca
avoided.

The 'first runnings' of liquid
are commonly foul, and are pu
returned until the fluid runs pe
and transparent, when it is 'tu
'filtered liquor cistern,' or pr
In many cases the liquid doe
become transparent by simply pa
the filter; hence has arisen th
TERING POWDERS, or substances
choke up the pores of the media
degree to make the fluid pass c
employment of these powders, ca
taken that they are not in too f
division, nor used in larger qu
are absolutely necessary, as the
choke up the filter, and to ab
quantity of the liquid. The
powder used, the more rapid wil
gress of the filtration, and the l
the period during which the ap
continue in effective action. For
these substances are employed fo
purpose of decolouring or whiteni
rendering them transparent. In
it is preferable first to pass the f
a layer of the substance in co
from which it will 'run' but
taminated into the filter; or, if
is mixed with the whole body o
as in bleaching almond oil, &c.,
mixture through some coarser
remove the cruder portion befor
to run into the filter. Another
long agitation and subsequent
decant the clearer portion from
sediment, and to employ separat
the two. Granulated animal cha
according to the first method.

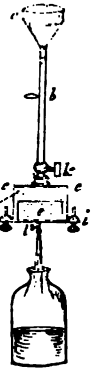
kc.; and filtering powder by the hird, to remove a portion of the to clarify castor and other oils. plan of mixing large quantities owder with castor oil, and throwle into the filter, as adopted by s, is injudicious. When simple required, it is better to use little r, and to continue returning the s' through, until, by the swelling of the filter bags, it flows quite his plan the same filters may be long period of time (for many will continue to work well; the usual method, they rapidly ower, and soon deliver their con-, and after a short time scarcely

a of great advantage to render a ting,' or to construct it in such a may 'feed itself,' so that it may l and at work without the constant the operator. On the small scale, readily effected on the principle on fountain lamp (see *engr.*); and e scale, by placing the vessel conunfiltered liquid on a higher level er, and by having the end of the fitted with a ball-cock, to keep the liquid in the filter constantly at the same height.

The rapidity of filtration depends upon the—porosity of the filtering medium—the extent of the filtering surface—the relative viscidity or mobility of the filtering liquid—the pressure or force by which the liquid is impelled through the pores of the filter, and—the porosity and fineness of nces it holds in suspension. The ent filter is produced when the first e first three are so graduated to the at the liquid filters rapidly, and e same time rendered perfectly t.

common method of filtration no is exerted beyond that of the f the column of the liquid resting ltering medium, but in some cases l pressure is employed. This is rse to for the purpose of proa more rapid filtration, and more r for filtering liquids that, from idity, will scarcely pass through s of substances sufficiently fine to their impurities in the ordinary

the easiest means of employing presltration is to increase the height of n of the filtering liquid. From the properties of fluids, by which they *press in an equal degree in all* directions, this column need not be of equal diameter throughout, but may be conveniently contracted to the size of a small pipe, as in the accompanying engraving, which represents a small filter on this construction at work. (*a*) is the funnel or reservoir of foul liquid; (*b*) a small pipe conveying the liquid to the filter; (*c c*) a chamber, of which the upper portion (*d*) is filled with the descending liquid, and the lower portion (*e*) with the filtering media; (*i i*) are screws by which the bottom plate is fastened on, which plate is removed to clean out or renew the filter. For use, the cocks (*k*) and (*l*) are closed, and the liquid poured into the funnel (*a*); the cock (*k*) is next opened, and, in a few minutes after, the cock (*l*), when an uninterrupted flow of filtered liquor will be obtained as long as any fluid remains in the funnel (*a*) and the tube (*b*). The length of the tube determines the degree of pressure. Care must be taken first to pass the foul liquid though a hair sieve, or some other strainer, to remove any substance that might choke up the pipe (*b*).



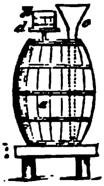
Another method of employing pressure in filtration is the withdrawal of the air from the receiving vessel, as in the vacuum filter, by which a pressure of about 14½ lbs. to the square inch becomes exerted on the surface of the liquid by the atmosphere. The vacuum in the receiving vessel may be produced by the air-pump or by steam.

A commoner method of applying pressure than either of those already mentioned is to condense the air over the surface of the liquid by means of a forcing-pump, or by steam.

On the small scale, pressure may be applied to filtration by means of a syphon, whose shorter leg has its mouth blown into the shape of a bell or funnel, over which filtering paper or fine calico may be stretched.

The application of pressure to filtration is not always advantageous, and beyond a certain limit is generally attended with inconvenience, if not with absolute disadvantage. It is found in practice that fluids under pressure take a longer period to run clear than without pressure, and that ruptures of the media more frequently take place in the former case, or with pressure, than in the latter. Great pressure is in no case advantageous.

The filters already noticed are those that act by the fluid descending through the media; but in some cases the reverse method is employed, and the liquid filters upwards, instead of downwards. These are called ascending filters, and are often preferable to those on the descending principle, because the suspended *matters that require removal by filtration usually sink*, and thus a portion escapes being forced into the pores of the filter. They are also more convenient when pressure is employed. Their construction depends upon the same principles as the common filter, and merely requires that the feeding vessel should be higher than the upper surface of the filtering media. OILS are conveniently filtered in this way, because of their little specific gravity. By fixing a small filter on this principle into the head of a cask, and pouring in water through a funnel, whose neck reaches nearly to the bottom of the cask, the oil will float up and pass the filter, leaving the sediment behind. In cold weather hot water may be employed.



a. Cask of oil.
b. Stand.
c. Funnel for water.
d. Filter.

In some cases the upward and downward systems of filtration are united in the same apparatus, and this plan is advantageous where the space for operating is limited. For this purpose it is merely necessary to connect the bottom of an ascending filter with the top of a descending one, or the reverse; the proper pressure being in either case applied. See CLARIFICATION, DEFECATION, FININGS, &c.

FI'NINGS. Substances used by publicans, brewers, wine merchants, &c., to clarify their liquors.

Prep. 1. (BREWER'S FININGS; COOPER'S F.) Isinglass (finely shredded), 1 lb., and sour beer or cider or vinegar, 3 or 4 pints, are macerated together, and more of the sour liquor added as the isinglass swells, until about a gallon has been used, agitation with a whisk or a small bundle of twigs being occasionally had recourse to, for the purpose of promoting the solution. As soon as the whole of the isinglass is dissolved, the mixture is reduced to the consistence of thin syrup, with weak mild beer, or cider, or any other liquid that the finings are intended for. The whole is next strained through a tammy cloth or a hair sieve, and at once reduced to a proper state of dilution, by the addition of more liquor. *Product.* 6½ to 7 galls. "A pound of good isinglass will make about 12 galls. of finings." (Ure.) *Used* to clarify fermented liquors, especially beer. 1 to 1½ pint is the usual dose for a barrel of ale or porter; and a quart for a hogshead of cider or wine.

2. (SPIRIT FININGS.)—*a.* Alum (ord. cryst.), 1 lb.; powder, and divide it into 12 equal portions, which are to be separately wrapped in blue paper, and marked No. 1. Next take of carbonate of soda (sesquicarbonate of the shops), 6 oz.; divide this as the last, wrap it in white paper, and mark each parcel No. 2. Keeps dry anywhere.

b. From alum, 1 lb.; salt of tartar (dry), ¼ lb.; proceed as before. The white papers containing the salt of tartar must be kept in a dry, well-corked, wide-mouthed bottle or jar. *Both* of the last two are used to clarify gin and cordials. The contents
blue papers are dissolved in
hot water, and the resulting
'rummaged up' with the liquo
the contents of one of the w
about ½ pint of hot water, is
the agitation continued for
longer; after which the cask i
and the whole allowed to repo
day. This is sufficient for a
36 galls.), but many persons
quantity. The effect is not
but also to 'blanch' the liquo

Obs. Good liquors, eithe
spirituous, need no artificial
always clarify themselves b
those, however, which are 'out
of inferior quality, it is ofte
without such a proceeding, the
able. This is particularly the
liquor. "Attempts to clarify
seldom fail to do harm. The
can be used with advantage f
muddy beer is isinglass." (U
vantages resulting from the
cation of fermented liquors a
not afterwards 'stand well o
much of the conservative a
which they contain is preci
'finings,' that their piquanc
more or less diminished, an
more than usually liable to
vapid, whether in cask or bo
the proportion of 'finings'
marked are their injurious
shorter the interval which el
accession of the several symp
We have seen the most disastr
follow the injudicious use of
especially in respect to those
a certain amount of piquan
and briskness, is an essentia
one instance which came u
upwards of 30 barrels of '
very strong old ale) was thus
to less than 1-3rd its origin
another, a large bottled stoc
old Burton' was found to b
able. In both cases the 'sp
got rid of by mixing it in an
3*d.* and 4*d.* beer.

Liquors which 'refuse to
clear, when treated with 'fini
manner, are called 'stubborn
cellarmen. See BREWING,
QUORS, WINES, &c.

FIRE. The calamities res
destructive agent are of such
rence, as to justly claim a noti
here. The causes of fires a
of a varied character, and, in
difficult to determine, because
of those concerned to suppr
connected with the matter.
convenient word given to the
to which so many fires are

ed, will, in general, be found to
to carelessness, recklessness, or
lieve that there are few fires
appened that might not have
d by the exercise of common
that a vast number have been
st negligence, arising from sheer
ndifference, to use no harsher
miliar instances, may be men-
ing sparks to fall on the ground
ere, without extinguishing them;
ked candle into rooms containing
bstances; smoking carelessly and
places, as workshops, warehouses,
&c.; keeping instantaneous light
proper places, and neglecting to
that may happen to fall on the
&c. The list might easily be
we believe every reflecting reader
himself. The great increase in
f fires since the introduction of
es, and the almost general use of
ot fail to have attracted the at-
ery one. The danger of matches
might be avoided by the use of
can only be ignited by rubbing
prepared surface of the box.
matches' are coming into general
t eventually supersede all the more
nds.

is consists of the exercise of those
cautions which the good sense
eful and trustworthy man, be he
r servant, cannot fail to suggest.
useless to enumerate them.

ht often be readily extinguished
discovered by the timely appli-
few buckets of water. When an
is found to be on fire, the door,
d windows should be immediately
possible, and only opened for the
projecting water on the flames.
ns the supply of air will be cut
pid combustion prevented. The
s to the lower doors and windows
(especially the shop window), which
judiciously kept open or removed,
pretence of rendering assistance.
t of this precaution has often caused
ouldering fire, that might have been
out, to burst into an unextinguish-
d flame.

been proposed at various times to
ain additions to the water used for
s of extinguishing fires, in order to
action more certain and effective.
d that sal ammoniac (5 oz. to the
ts this property in a remarkable de-
ral other articles, as common salt,
and kitchen soda, act in the same
gh less effectively. A few buckets
ter will speedily arrest the progress
before it has much extended itself.
ion is easily applied, by adding the
ter to the buckets *of water, which*
ued by hand, or to feed the engine for the first few minutes of its working. When, however, a fire has made much progress, the action of such substances becomes scarcely perceptible.

Chimneys on fire are readily extinguished in several ways, without having recourse to throwing water down them from the top, by which much damage is frequently done to the furniture in the rooms. One of the simplest methods is, to cautiously scatter a handful of flowers of sulphur over the dullest part of the burning coals; the sulphurous vapours, being incapable of supporting combustion, rapidly extinguish the flames. Another method is, to shut the doors and windows, and to stop up the bottom of the chimney with a piece of wet carpet or blanket, throwing a little water or flowers of sulphur, or even common salt, on the fire immediately before doing so. By this means the draught is stopped, and the burning soot extinguished for want of air. In many of the first-class houses recently erected, 'fire-place shutters' are provided, which, when partly drawn down, act as powerful bellows or 'blowers;' and which, when wholly drawn down, so as to touch the hearth-stone, entirely close up the fire-place, and instantly extinguish the combustion of the fuel in the grate, or that of the soot in the chimney. This simple arrangement, the advantages of which were pointed out in an early edition of this work, renders fires in chimneys of little moment, as it is only necessary to draw down the shutter to put them out. If a chimney is stopped at top, instead of at the bottom, the whole of the smoke must, of necessity, be driven into the apartment.

Escape from apartments on fire may be best effected by creeping on the hands and knees. In this way the window or door may be reached. It is found that the atmosphere of a room so full of smoke as to produce suffocation to a person standing upright, may generally be safely breathed on nearly a level with the floor. A damp cloth, or handkerchief, tied over the mouth and nostrils, or, still better, over the whole face and head, will enable a person to effect a passage through the densest smoke, and, in many cases, to escape from buildings on fire, when otherwise it would be impracticable. Should descent by the staircase be found impossible, then the window should be immediately sought, and a ladder or fire-escape waited for. In the absence of either, if the danger is imminent, a rope should be made by tying the sheets and blankets of the bed together, one end of which should be firmly secured to a chair or table, or preferably to one of the bed-posts, and with this apparatus descent should be cautiously attempted. Jumping out of the window should be avoided, as persons who have not been brought up as clowns, or harlequins, run just as much danger in performing such an exploit as they do by *remaining in the* burning building. When it *is impossible to* escape from a burning building by the stairs or windows, retreat may be sometimes secured by a trap-door opening on to the roof, or by a skylight, when, unless it be an isolated house, the roof of one of the adjoining buildings may probably be gained with safety.

Fire-escapes of various kinds have been employed of late years in the metropolis, and have proved of the greatest value in rescuing persons from burning buildings.

It is said that there is no instance on record of a person being burnt to death in a dwelling-house in Edinburgh, where the houses are usually high; yet in London, where fire-engines and fire-escapes are provided in greater numbers, deaths are very frequent from this cause. The reason of this difference is, that in the former city the stairs are all made of stone, by which means a road of escape is secured.

The clothes of females and children, when on fire, may be most readily extinguished by rolling the sufferer in the carpet, hearth-rug, table-cover, a great-coat, cloak, or any other woollen article at hand. If this be expertly done, the flames may be rapidly put out, unless the skirts of the dress be distended by hoops or crinoline, when there is great difficulty in staying the progress of the flames. Should assistance not be at hand, the person whose clothes are on fire should throw herself on the ground, and roll the carpet round her, as before described; or if such a thing is not in the room, she should endeavour to extinguish the flames with her hands, and by rapidly rolling over and over on the floor. In this way the fire will be stifled, or at least the combustion will proceed so slowly that less personal injury will be experienced before assistance arrives. The advantage of assuming the horizontal position is manifest from the fact, that nine times out of ten it is the lower parts of the dresses of females that first catch fire.[1]

The extinction of fires on board ships by means of carbonic acid gas was some years since suggested to the Admiralty by Mr. J. R. Hancorn. He proposes that a simple and economical apparatus should be attached to every decked vessel, capable of supplying this gas, which is a well-known non-supporter of combustion, and will extinguish fire at the very instant of coming in contact with the burning matter. Chalk with sulphuric acid diluted with water (vinegar, or any other acid will do) yields 44% of the gas; hence, a ton of chalk, and a fourth part of that quantity of sulphuric acid, will be found sufficient to extinguish any fire on board a ship. Mr. Hancorn also proposed this as a method of destroying vermin in ships, such as rats and cockroaches, for which purpose it is more easily applied and more effectual than that usually adopted. This plan was rejected by the A
a fear that the destructive act
might extend to the crew as w
But "it surely is possible
means to expel the gas before
the ship's hold. At any rate, t
would be obtained of extinguish
though the crew might have o
stand on."

It is often difficult to get
buildings on fire, but it is said
readily come out if, after bein
the saddle and bridle, or the
which they are accustomed, an
them as usual.

Fire Anni'hilator (Phillips's).
tially a gaseous fire engine, whi
ment can be made to dischar
mixed gases and vapours having
checking combustion. When f
it was generally regarded as a
invention, but it has not prove
substitute for the common
For extinguishing fires on boa
close apartments it is und
adapted, but as a street engine
tively useless, owing to the unm
ture of its fire-annihilating vapo

The composition with which t
hilator' is charged is a mixture
cyanide of potassium, sugar, a
potassa. It is set in action b
glass vessel containing oil of
being fractured, permits the aci
the 'charge,' when the anti-com
liberated, and rushes forth wit
tuosity.

Fire-damp. See HYDROG
retted.)

Fire-en'gine. The common
a compound forcing-pump, cons
'forcing-pumps' placed on opp
an air-vessel,' with which both
The 'fulcrum' of the 'lever' b
pumps are worked is placed mi
them; consequently they act a
charging the air-vessel. In orde
very forcible jet, it is necessary to
escape of any portion of the co
air-vessel until the confined air is
compressed. The lever is co
hand-rails on each side of the engi
are alternately raised and depr
workers. Engines worked by
are now common in London and
large towns.

Fire-proofing. See INCOMBUST

Fire-works. See PYROTECHNY,

FIRES. (In pyrotechny.) C
may be termed, not inaptly, the
of the pyrotechnist's art, since o
lence the attractions of most ot
of fire-works depend. The foll
under judicious management, y
remarkable beauty.

Blue Fire. Prep. 1. From

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[1] For the mode of rendering muslin and other inflammable articles of ladies' apparel fire-proof, see INCOMBUSTIBLE FABRICS.

; sulphur, 2 parts; nitre, 5

gar, 2 parts; charcoal, 3 parts;
ssa, 5 parts; sulphur, 13 parts;
a, 77 parts.
rd.) Charcoal and orpiment,
black sulphuret of antimony,
, 48 parts; sulphur, 64 parts.
Tersulphuret of antimony, 1
2 parts; dry nitre, 6 parts.
position used for the Bengal or
t, employed at sea.
rchand.) Sulphur, sulphate of
nmonio-sulphate of copper, of
; nitre, 27 parts; chlorate of
a. For theatrical illuminations.
ndered either lighter or darker
sening or increasing the quan-
lphate of potassa and ammonio-
pper.
BLUE—Marchand.) Sulphur,
ned alum, 23 parts; chlorate of
ts.
BLUE—Marchand.) Calcined
bonate of copper, of each, 12
, 16 parts; chlorate of potassa,

Sulphate of copper, 7 parts;
arts; chlorate of potassa, 69

.) Nitre, 2 parts; sulphur and
parts; gunpowder, 4 parts.
lphur, 1 part; dried verdigris,
ate of potassa, 9 parts.
a. *Prep.* 1. (Marsh.) Chlorate
parts; charcoal (alder or willow),
hur, 22½ parts; nitrate of stron-
For pots.
Charcoal, 4¼ parts; sulphuret
½ parts; chlorate of potassa, 17½
r, 18 parts; nitrate of strontia,
r boxes and stars.
nd.) Sulphur, 16 parts; chalk
s; chlorate of potassa, 61 parts.
purple. [illegible] Fire (*below*).
. *Prep.* 1. Nitrate of baryta,
lorate of potassa, 8 parts; fine
rts; sulphur, 13 parts.
etallic arsenic, 2 parts; charcoal,
ate of potassa, 5 parts; sulphur,
trate of baryta, 77 parts. Very
rticularly when burnt before a

Bird.) Charcoal and black sul-
timony, of each, 2 parts; chlorate
parts; sulphur, 6 parts; nitrate
parts.
s.) Lamp black, 1 part; chlorate
parts; sulphur, 6 parts; dry ni-
ta, 18 parts.
nd.) Boracic acid, 10 parts;
rts; chlorate of potassa, 73 parts.
d.
nd.) Chlorate of potassa, 18
r, 22 parts; *nitrate of baryta,*
r theatrical illuminations.

7. (Light green—Marchand.) Sulphur, 16 parts; carbonate of baryta, 24 parts; chlorate of potassa, 60 parts. Extremely delicate.

8. (Marsh.) Charcoal and sulphuret of arsenic, of each, 1¾ part; sulphur, 10½ parts; chlorate of potassa, 23½ parts; nitrate of baryta, 62½ parts. For pots or stars.

Lilac Fire. *Prep.* 1. (Marsh.) Black oxide of copper, 6 parts; dry chalk, 20 parts; sulphur, 25 parts; chlorate of potassa, 49 parts. For pans.

2. (Marsh.) From black oxide of copper, 3 parts; dried chalk, 22 parts; sulphur, 25 parts; chlorate of potassa, 50 parts. For stars.

Orange Fire. See Red Fire, No. 8 (*below*).

Pink Fire. *Prep.* (Marchand.) Charcoal, 1 part; chalk and sulphur, of each, 20 parts; chlorate of potassa, 27 parts; nitre, 32 parts. For theatrical illuminations. See Red Fire, No. 10 (*below*).

Purple Fire. *Prep.* 1. From lamp black, realgar, and nitre, of each, 1 part; sulphur, 2 parts; chlorate of potassa, 5 parts; fused nitrate of strontia, 16 parts.

2. (Marsh.) Sulphuret of antimony, 2¾ parts: black oxide of copper, 10 parts; sulphur and nitrate of potassa, of each, 22¾ parts; chlorate of potassa, 42 parts. For pans.

3. (Marsh.) Sulphate of copper, 9¾ parts; sulphur, 13 parts; chlorate of potassa, 77½ parts. For stars.

4. From sulphur, 12 parts; black oxide of copper, 12 parts; chlorate of potassa, 30 parts. See Crimson Fire, No. 3 (*above*), and Red Fire, No. 9 (*below*).

Red Fire. *Prep.* 1. From sulphur, sulphuret of antimony, and nitre, of each, 1 part; dried nitrate of strontia, 5 parts.

2. (Mr. A. Bird.) Charcoal, 1 part; black sulphuret of antimony, 4 parts; chlorate of potassa, 5 parts; sulphur, 13 parts; dried nitrate of strontia, 40 parts.

3. (Fownes.) Lamp black, 2 parts; chlorate of potassa, 8 parts; sulphur, 9 parts; dried nitrate of strontia, 32 parts.

4. (Marchand.) Sulphur, 16 parts; carbonate of strontia, 23 parts; chlorate of potassa, 61 parts.

5. (Marchand.) Chlorate of potassa, 20 parts; sulphur, 24 parts; nitrate of strontia, 56 parts. For theatrical illuminations.

6. (Marsh.) Coal dust, 2 parts; gunpowder, 6 parts; sulphur, 20 parts; dried nitrate of strontia, 72 parts.

7. (Ruggieri.) Sulphuret of antimony, 4 parts; chlorate of potassa, 5 parts; sulphur, 13 parts; fused nitrate of strontia, 40 parts. A little charcoal or lamp black makes it burn quicker.

8. (Orange red—Marchand.) Sulphur, 14 parts; chalk, 34 parts; chlorate of potassa, 52 parts.

9. (Purple red—Marchand.) Sulphur, 16 parts; chalk, 23 parts; chlorate of potassa, 61 parts.

10. (Rose-red—Marchand.) Sulphur, 16

parts; dried chloride of calcium, 23 parts; chlorate of potassa, 61 parts. See PINK FIRE.

11. From charcoal, 2 parts; chlorate of potassa, 6 parts; sulphur, 13 parts; dried nitrate of strontia, 40 parts.

Violet Fire. *Prep.* 1. From charcoal, 8 parts; sulphur, 10 parts; metallic copper, 15 parts; chlorate of potassa, 30 parts.

2. (DARK VIOLET—Marchand.) Alum and carbonate of potassa, of each, 12 parts; sulphur, 16 parts; chlorate of potassa, 60 parts.

3. (PALE VIOLET — Marchand.) Sulphur 14 parts; alum and carbonate of potassa, 16 parts; chlorate of potassa, 54 parts.

White Fire. *Prep.* 1. From nitre, 60 parts; sulphur, 20 parts; black antimony, 10 parts; meal powder, 6 parts; powdered camphor, 4 parts. For either pans or stars.

2. (Mr. A. Bird.) White arsenic, 1 part; charcoal, 2 parts; black antimony, 16 parts; nitre, 48 parts; sulphur, 64 parts.

3. (Marchand.) Charcoal, 2 parts; sulphur, 22 parts; nitre, 76 parts. For theatrical illuminations.

4. (Marchand.) Gunpowder, 15 parts; sulphur, 21 parts; nitre, 64 parts. As the last.

5. (Marsh.) Gunpowder, 12½ parts; zinc filings, 18 parts; sulphur, 23 parts; nitre, 46½ parts. For pans.

6. (Marsh.) Zinc dust or filings, 15 parts; sulphur, 28 parts; nitre, 57 parts. For stars.

7. (Ruggieri.) Sulphur, 13¼ parts; sulphuret of antimony, 17¼ parts; nitre, 48 parts.

8. (Ruggieri.) From realgar, 2 parts; sulphur, 7 parts; nitre, 24 parts.

9. (Ruggieri.) Charcoal, 1 part; sulphur, 24 parts; nitre, 75 parts.

10. (Ruggieri.) Iron or zinc borings, 25 parts; gunpowder, 100 parts.

Yellow Fire. *Prep.* 1. From sulphur, 16 parts; dried carbonate of soda, 23 parts; chlorate of potassa, 61 parts.

2. (Marchand.) Gunpowder, 14 parts; sulphur, 16 parts; dried soda, 20 parts; nitre, 50 parts.

3. (Marchand.) Charcoal, 1½ part; sulphur, 17½ parts; dried soda, 20 parts; nitre, 61 parts.

4. (Marsh.) Charcoal, 6 parts; sulphur, 19½ parts. For pans. Very beautiful.

Obs. The ingredients in the above compounds are to be separately reduced to powder, and sifted through lawn, after which they should be kept in well-corked wide-mouthed bottles until the time of mixing them for use. The chlorate of potassa, more especially, must be separately treated, and cautiously handled, in order to prevent the possibility of explosion, from friction, whilst it is in contact with combustible matter. The requisite quantity of each of the ingredients being weighed out and placed on a clean sheet of white paper, the whole is to be thoroughly but carefully mixed together with a light hand, by means of a bone or wooden knife. The compound is next lightly packed into small cups or pans for

illuminations, or into small pill-
and trains, a little priming an
being lastly attached to each
success, the several ingredient
and commercially pure; and t
to the state of a uniform pow
be taken that they are not ab
or too finely pulverised. The nit
alum, saltpetre, carbonate of s
being weighed, require to be g
an iron pot or pan, until they
and lose their hygrometric mo
of crystallisation. To ensure t
mixture of the ingredients, t
they have been stirred togeth
before directed, may be passed
or perforated zinc or brass siev
coloured fires rapidly deteriora
and even sometimes inflame
to prevent disappointment and
should not be prepared long b
be required for use, and shoul
some situation in which thei
combustion would be producti
trous consequences.

Of the above formulæ, tho
name of the late Mr. Marsh,
more especially deserve the at
pyrotechnist. See FLAME, PYR

FISH. *Syn.* PISCES, L. I
fourth class of vertebrate an
BRATA) in the Cuverian arran
animal kingdom, and in the v
genera and species are secon
INSECTA, whilst in prolificnes
they probably exceed all other a
that reach a size equal to th
smallest member of their prodigi
sides their value to man as foo
him with oil, isinglass, and vari
cles of utility and luxury, and
directly or indirectly, an inexha
of manure for the fertilisation
As food, fish are undoubtedly v
nutritious, although [illegible] so tha
animals or the grains of the c
the various substances used a
man, fish are, however, the mos
into a state of putrefaction, and
fore be only eaten when perfectly
recently taken, then only when
preservation has been ensured
ordinary methods employed for
Those that are the whitest and m
cooked, as cod, flounders, haddo
turbot, whiting, &c., are the
gested; and those abounding i
as eels, herrings, mackerel, sal
most nutritious, though the
offend the stomach. Salt-water
said to be more wholesome than
without sufficient reason. Salt
of digestion, unless when carefu
well masticated. Skin diseases
more common among those who
ally on fish than among those wh

obably arises from their use being
l by a proper quantity of fresh
fruit, both of which are scarcer
st than further inland. As one
sents of a mixed diet, the value
putable. Acid sauces and pickles
r additions to fish, from their
rding the progress of putrefac-
correcting the relaxing tendency
tities of oil and butter.

Propagation. The fecundity of
vely marvellous. According to
servations of Mr. Frank T. Buck-
yield about 1000 ova or eggs to
eir weight: a trout weighing 1 lb.
wards of 1000; a mackerel (1 lb.),
rring (¼ lb.), 19,840; a sole (1 lb.),
urbot (8 lbs.), 385,200; and a cod
72,000. The ova here spoken of
commonly called the 'hard roe'
fish; the 'soft roe' is 'the milt'
fish. To protect the spawn, and
hatched, is the object of the art
re, which has made great pro-
late years. When the spawn is
ly protected, the greater portion
sted, being swept away by the
devoured by fish, birds, and
e natural enemies of the newly
are, again, so numerous, that it is
ising that any should escape de-
According to given data and accu-
tions of the returns of fisheries
essrs. Ashworth and Buist, only
egg out of every thousand depo-
ecomes a fish fit for human food.
both fresh and salt-water, suffer in

The hatching of fish by artificial
been carried out on a large scale in
l has been commenced in Scotland
l, and on a small scale in England.
ing fish, having been caught by a
de to deposit her eggs by gently
n the abdomen; these are impreg-
milt' ex[illegible] from the male fish
r manner, [illegible] with them in
tub or other vessel prepared for the
The impregnated eggs are placed
hallow boxes, bottomed with gravel
les, and so arranged that a small
f water from a reservoir may flow
to another. The time of hatching
entirely upon the temperature of the
rom 40° to 45° Fahr. seems to be the
t temperature. After about 50 days
se of salmon), when all goes well, the
sh makes its appearance as a mis-
creature about an inch long, with a
taining the yolk of the egg attached
bdomen. At 3 days old the fry is
gr. in weight; at 16 months it has
l to 2 oz. To preserve the young
alth, the boxes must be covered with
f slate or zinc. The French fish-
generally feed the young fry with
powdered fine. The Scotch give
boiled liver. Mr. Buckland prescribes a diet of roe of sole, or plaice, or whiting. As to the age at which it is advisable to turn the young fish out of the nursery, there is much difference of opinion. Some breeders recommend turning them out as soon as the 'umbilical bag' is absorbed; others think they should be taken care of till they are older and stronger, and better able to defend themselves or escape from attack. For full details respecting the artificial propagation of fish, the reader is referred to Mr. Buckland's recent work, entitled 'Fish-Hatching.'

Choice, &c. "The flesh of any fish is always in the highest perfection, or in season, as it is called, during the period of the ripening of the milt and roe. After the fish has deposited the spawn, the flesh becomes soft, and loses a great deal of its peculiar flavour. This is owing to the disappearance of the oil or fat from the flesh, it having been expended in the function of reproduction." (Fleming's 'Phil. of Zoology.') Fish should be dressed as soon after being caught as possible, as much of their peculiar delicacy and flavour is lost by keeping, even for a few hours. Turbot and salmon are said by the fishmongers to be improved in flavour when 2 or 3 days old, but this is surely a mistake, as the former, when dressed immediately after being caught, possesses a fine creamy taste, which it afterwards loses; whilst the latter, by the loss of a single tide, loses a portion of the fine white curd which is previously found between the flakes, and by longer keeping, this curd, with the larger flakes, disappear altogether. In the eyes of some epicures the richness is, however, increased by this change. Mackerel, and some other fish, suffer so much from keeping only a few hours, that they become quite unwholesome. Herrings offer a remarkable example of the advantage of dressing fish as fresh as possible. When cooked soon after being caught, they possess considerable delicacy and flavour, but after being kept for only a few hours the oil separates from the flesh, and they become soft, greasy, and strong-flavoured.

In the choice of every kind of fish, stiffness, brightness of the eyes, and redness of the gills, may be regarded as invariable signs of freshness. A peculiar elasticity will also be perceived in fish recently caught, little or no permanent impression being made by the ordinary pressure of the fingers, from the flesh immediately rising when the pressure is withdrawn. Fresh fish also lie in a partly curled position, and never quite straight, as is the case when they have been kept for some time. Thickness and fleshiness are deemed marks of the good condition of all fish.

Cleaning, dressing, &c. On the proper cleaning of fish preparatory to dressing it, depends much of its delicacy and flavour. *Ordinary* cooks seldom do this well, from not *slitting* the fish sufficiently open to permit the inside to be thoroughly washed, and seldom using sufficient water. The superior flavour of fish cleaned by the fishmongers arises from their performing the operation more completely, and from the large quantity of water they employ about them. The flavour of all fish is improved by adding a little salt or vinegar to the last water in which they are washed. The sound, milt, and roe, should be carefully cleaned and preserved.

Fish is preferably 'dressed' by simple boiling, broiling, or frying; in fact, the finer kinds of fish are often injured by the excessive interference of the cook. When boiled, "all large fish, with the skin whole, must be placed on the fire in cold water; if crimped, or cut into slices or pieces, in boiling water; if whole, it must not be covered with more than two or three inches of water, or the skin will crack, and not only spoil the appearance of the fish, but will diminish the gelatine and gluten it contains, and instead of eating firm and full of flavour, it will be soft and woolly, especially if over-boiled." (Soyer.) As soon as a scum rises from boiling, it should be removed by the skimmer. The addition of a little salt or vinegar to the water improves the flavour of most fish, and renders the flesh firmer. The proportions should be "two teaspoonfuls of salt to every quart of water." "If the fish be whole, as soon as it begins to boil remove the cover on one side, and let it simmer gently until done." (Soyer.) A fish is known to be sufficiently dressed by the flesh in the thicker parts separating easily from the bone. "If a large fish, I generally try it by gently pushing a wooden skewer through the thickest part; if it goes in easily, it is done." (Soyer.) When this is the case it should be removed from the kettle, as by soaking in the water fish loses its firmness, and becomes soddened. Sole, skate, and mackerel, are usually put into boiling water, whether whole or sliced. Fish for broiling should be well washed in strong vinegar, wiped dry with a towel, and flowered before placing them on the gridiron; and the bars of the latter should be hot, and well buttered. (Rundell.) Fish for frying should be prepared as for broiling, and the butter, oil, or lard, should be allowed to boil for a minute or two before putting them into the frying-pan. The latter should be perfectly smooth and bright, and the butter or oil in abundance, to prevent the fish sticking to it and burning. As the fish are cooked solely by the heat of the melted fat, to fry them in the highest perfection there should be enough of it to cover them. Butter or oil is the best for the purpose. To avoid loss, the contents of the frying-pan, after the fish is removed, should be poured into a clean jelly-jar or basin, and reserved for another occasion. The fish being removed from the pan, the superfluous fat should be drained from them preparatory to 'serving' them. When fish is divided into fillets or
cutlets before being cooked, it i
out the bones, and to dress it w
&c.

In serving fish of the finer k
additions are required than me
the ordinary fish sauces and
dishes are commonly garnis
parsley, for the sake of a
boiled parsley, chopped small,
pany it. All kinds of fish sho
a napkin.

Caution. It sometimes hap
bone accidentally swallowed i
œsophagus, and occasions ser
ence; in fact, instances have be
so much irritation has arisen
followed. In such cases it is a
as possible, to take of tartar
dissolved in warm water, ½ pin
ately afterwards the whites of
coagulated mass will not rem
much more than two or three r
remedy has been known to "
than 24 pins at once."

FISH GLUE. See GLUE and

FISH SKIN. *Syn.* SHARK S
of the spotted dog-fish or roug
de mer, Fr.), stretched and d
polishing wood and ivory. Sev
ties of fish skin are employed in
dressed skin of the 'rousette'
sette, Fr.) is transparent, and
Cemented on green paper, an
and polished, it is used as ve
boxes. The skins of several va
lus are also used for both the
See SHAGREEN.

FIVE HERBS. See SPECIES

FIX'ATURE. *Syn.* BANDOL
TIQUE, EAU COLLANTE, FIXAT
consists of any of the simple
lages, combined with a little
serve it, and with a little perfu
more agreeable.

Prep. 1. From [illegible]en,
moss, soaked [illegible] for
and after being drained, and p
clean napkin, dissolved by b
water, q. s. The decoction is st
cambric, and when nearly cold
about ⅓rd or ¼th of its volume of
or other scented spirit, with th
tion of a few drops (5 or 6) o
Sometimes a little brandy is ad
cilage, and when it is intended
as is common with home man
spirit is frequently omitted alt
of the prepared moss is fully en
of strained decoction, if rightly

2. From quince seed boiled i
last. ¼ oz. yields nearly ¾ pi
decoction.

3. Pale gum arabic (picked
water, 2 fl. oz.; pure water, 3 f

4. Gum arabic, 3½ oz.; wate
solve, and drop in eau de Colo

diness at first occasioned ceases
by agitation; the next day de-
portion. All of the above are
and keep well.

od.) Gum tragacanth, 1½ dr.;
proof spirit, 3 ozs.; otto of roses,
cerate 24 hours, and strain.

oz.; hot water (that will barely
nger to be held in it without
infuse in a covered jug or basin,
ut the liquid, and as soon as cold,
spirit (or brandy or Cologne
oz., and strain.

oline is used by ladies and by
for stiffening the hair, and to
firmly and remain in place. It
her by moistening the fingers and
air through them, or by means of
e. See POMMADE.

R. See CARBONIC ACID.

LS. See FAT and OILS.

HITE. See WHITE PIGMENTS.

Gas or vapour in an incandescent
light emitted from pure flame is
eeble; illuminating power being
ly dependent upon the presence of
See ILLUMINATION, and below.

ours. The vapours of metallic
communicate colours to flames.
ristic colours of some metals are
d, and their exhibition forms a
eriment of chemical lecturers.
flames are generally produced by
on of alcohol or rectified spirit
salts in fine powder. In this
colour is communicated by bora-
hloride of copper; a RED one by
f iron, lime, or strontia; a VIOLET,
nd its salts; and a YELLOW, by
la. Messrs. Church and Crookes
described a mode of exhibiting
istic flames of the metals which
adapted for the lecture-table.[1]
made in the same way as 'gun-
be soaked in solutions of the chlo-
lifferent metals, dried with care,
y. A good 'gun-paper' for the
prepared by soaking strips of
sing-paper for ten minutes in a
parts oil of vitriol with 5 parts
acid, both by measure. The strips,
out of the acid, should be washed
d, and then with hot rain or dis-
till the washings are no longer
taste. The solutions of the me-
need not be very strong; but if
m, the strips of 'gun-paper' will
ly and completely saturated with
s some of the chlorates attract
m the air, it is better to dry the
red with them before the fire pre-
hting them. They are shown to
ge when a strip is loosely crum-
a pellet, lighted quickly at one
thrown up into the air against a dark back ground. They leave after burning, if properly prepared, no ash whatever. Paper prepared with the salt of potassa gives a flash of VIOLET flame, that prepared with the soda salt the characteristic YELLOW flame, and that with chlorate of baryta a very beautiful GREEN light. The chlorates of strontium, lithium, and calcium, when thus ignited, gives intense colours. The VIOLET-BLUE flame of copper is well seen, even with the chloride of that metal, while paper soaked in nitrate of potassa shows the potassium flame better than if the chlorate be used. 'Gun-paper' prepared with a very weak solution of chloride or chlorate of thallium shows the characteristic SPRIG-GREEN flame of that metal with great distinctness. Chlorate of barium, being an article of commerce, may be employed for the preparation of the other chlorates, it being merely necessary to add to this salt in solution an exactly equivalent quantity of the sulphate or carbonate of the metal whose chlorate is desired. For instance, in order to make 'chlorate of copper,' 15·1 gr. of chlorate of barium being dissolved in hot distilled water, a boiling solution containing 12·5 gr. of pure crystallised sulphate of copper is to be added to it. Insoluble white 'sulphate of baryta' falls, while the solution, filtered and evaporated, yields the new chlorate in crystals. See FIRES, PYROTECHNY, &c.

FLAN'NEL. It has been shown by the experiments of Count Rumford that the conducting power of the different materials employed for clothing varies considerably. A thermometer surrounded with cotton wool, and heated by immersion in boiling water, took 1046 seconds to lose 135° Fahr., when plunged into a bath of melting ice; but, under the same circumstances, when sheep's wool was employed, 1118 seconds elapsed before a like sinking of the thermometer took place ('Phil. Trans.,' 1792); thus showing the greater conducting power of the former, and consequently the superiority of the latter substance for the manufacture of warm clothing. But the chief advantage of wool, as an article of under-clothing, depends less upon its actual power of conducting heat than its peculiar texture. Flannel acts as a gentle stimulus on the skin, and exercises the most beneficial action, by keeping the pores clean, and in a state most favorable to perspiration. This action is a species of friction similar in character, although inferior in degree, to that of the common flesh-brush or horse-hair glove, so long employed as a skin stimulant. Flannel has also the advantage of absorbing the perspiration as soon as emitted, and allowing its watery portion to pass off into the atmosphere almost as soon as formed, but this is not the case with cotton and linen fabrics. The different effects of flannel and linen are particularly susceptible during brisk exercise. When the body is covered with the former, though perspiration be *necessarily increased*, the perspired matter

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freely passes off through the flannel, and the skin remains dry and warm. If the same exercise be taken in linen shirts, perspiration, as in the former case, is indeed also increased, but the perspired matter, instead of being dispersed into the atmosphere, remains upon the linen, and not only clogs the pores of the skin, but gives a disagreeable sensation. From this property of flannel, persons who wear it next the skin seldom catch cold from changes of temperature, even though perspiring profusely; but in similar cases, when linen or calico shirts are worn, chilliness immediately comes on, followed by sniffling, sneezing, and cough, and all the other symptoms of severe catarrh.

The common objections raised against the use of flannel are founded on vulgar prejudices, ignorance, obstinacy, or bravado, and are undeserving of the notice of sensible people. In a fickle and moist climate like that of England, every person should wear a robe of flannel next the skin, or at all events a waistcoat of flannel reaching below the loins; and this should not be discarded as soon as the cold weather has passed, but its use should be continued all the year round; for in reality, flannel is, if possible, even more required in summer than in winter, because persons perspire more freely in hot than in cold weather, and are consequently more susceptible of cold, while at that period of the year their clothing is less capable of protecting them from the effects of sudden changes of temperature and draughts of cold air, moisture, &c. Females, children, persons of delicate constitutions, and all others who from their habits of body or life perspire freely, or are much exposed, should wear flannel.

In washing flannels, it is recommended that they should only be put into warm water, by which method their colour will be preserved, and they will be prevented from shrinking.

FLASH. *Prep.* From burnt-sugar colouring, 1 gall.; fluid extract of capsicum or essence of Cayenne, ¾ pint, or enough to give a strong fiery taste. Used to colour spirits, and to give them a false strength. It is made by the brewers' druggists, and labelled 'ISINGLASS AND BURNT SUGAR.'

FLASKS. The late lamented and ingenious Mr. Fownes suggested the employment of Florence oil-flasks as cheap substitutes for retorts, receivers, digesters, and some other vessels used for chemical purposes. His plan was to cut the neck smoothly round with a hot iron, and softening it in the flame of a good argand gas-lamp, to turn over the edge so as to form a lip, or border. The neck will then bear a tight-fitting cork without splitting.

FLATULENCE. *Syn.* FLATULENCY, WIND. In pathology, a morbid collection of gas in the stomach and bowels. Its most common cause is indigestion. When the natural fluids of the stomach are secreted in a hea
exercise an antiseptic and dig
the food, by which it is spee
magma that is little liable
change whilst in the body;
reverse is the case, fermenta
mences, and the stomach and
cera become distended with
well-known symptoms of flat
loped in rapid succession.
gas thus accumulated in the
often enormous. An ordina
fermentation yields about 60
of gas, and many vegetables
(Dr. Hales.) It is, therefore,
prising that so much inconve
felt when the food, instead o
and assimilated, runs into th
fermentation.

The treatment of flatulency
in the selection of proper
Oleraceous vegetables, peas, bea
potatoes, and indigestible fruit
cially avoided, as well as the
tities of weak or warm liq
should consist principally of a
fully but not over-cooked, w
quantity of good mealy potat
whole), and good wheaten m
rately seasoned with common
The most suitable beverages
water, and a little good brand
with water. The healthy ton
may be re-established by the
tonics, bitters, and mild aperie

To relieve the fit of flatulen
and aromatics, as black pepper
permint, ginger, cinnamon, la
spices, may be had recourse
peppermint cordial, or of bran
voured with peppermint or gin
and efficient remedy. A few
of ether, with a little tincture
spirit of sal volatile, seldom fa
See DYSPEPSIA.

FLAVOURING SUBSTANC
SENCE, OIL (Volatile), SPICE,

FLAX. See LINEN, LINSEED

FLEA. This troublesome l
the *Pulex irritans* of Linnæus,
the *Suctoria*, or fourth order
Its favorite haunts are our
clothing, and its most produc
places are in the 'flue' which c
allow to accumulate underne
Cold, light, perfumes, and
inimical to its propagation.

FLESH. *Syn.* CARO, L.
substances of animals; the so
tions of the body, as distingu
bones and fluids. See FIBRIN,

Flesh-brush. This simple ins
for exciting the cutaneous circu
which have the bristles set on
are esteemed the best. The fle
flesh-rubber is a useful

ush. Those manufactured by
ind Moore, in imitation of the
or mitten, are superior to all
: absence of both flesh-brush
gh towel wound round the hand
ate. See FRICTION.

FLY.

GO FLIP.

A flat fish, very like the
ller, and of more obscure
ry common about the British
d in the Northern, Baltic, and
seas. Its flesh is very whole-

a. FARINA, L. The finely
ssed' meal of bread corn, and
ome of the leguminosæ. That
lly as 'flour' in this country is
pring varieties of *Triticum vul-*
m wheat).

Of varieties of flour there are
ng chiefly on the amount of
' contain, and the relative fine-
ves through which they are

FLOUR, PASTRY FLOUR; FA-
E, F. SEMINIS TRITICI. The
ined from the méal produced
ding of wheat between sharp
s of a sieve of 64 wires to the
pastry.

The remainder of the flour of
ng, obtained by means of a
sieve. *Used* for making house-
t is mostly reground for the

he finest part of the flour, ob-
rinding 'middlings' between
Used by the bakers for their
bread.

he coarse flour, from which the
n sifted. *Used* for making sea
ngerbread, and to fatten poultry

OUSEHOLD FLOUR. This is usu-
lly once, and sifted to $\frac{4}{5}$ths of
the wheat.

N FLOUR is ground and sifted
the weight of the wheat.

o Mr. Accum, thirty-two pecks
he London mills yield, of flour
llard, 8 parts; and bran (*furfur*
ts; the bulk of the wheat being
nding.

o Mr. Hard, miller, of Dartford,
Pereira, the wheat having been
usual way, is allowed to remain
of meal for some time before
ich removes the heat caused by
d enables the miller to obtain
d the baker a better quality,
d' immediately it is ground.
ss of dressing is by a wire
ing a certain number of sheets
ture or fineness, which cylinder
t hair *brushes attached to a* spindle passing through the centre of the cylinder, and laid out so as to gently touch the wire. This cylinder is fed by a 'shoe' with the meal; then the 'flour' and 'offal,' after passing through the wire in this way, are divided by wooden partitions fixed close to the outside of the cylinder." "The produce of the wheat-meal dressed through the wire machine consists of—1, Flour;—2, White Stuff, or Boxings, or Sharps;—3, Fine Pollard;—4, Coarse Pollard, or Horse Pollard;—5, Bran. The 2nd product (*i. e.* the white stuff) is then submitted to another 'dressing' through a fine cloth machine, and produces—1, Fine Middlings, for biscuits;—2, Toppings, or Specks;—3, Dustings;—4, Best Pollard, Turkey Middlings, or Coarse Middlings."

TABLE *of the Produce of One Quarter of Wheat* (=504 lbs.) By MR. HARD.

Flour	392 lbs.
Biscuit or fine middlings . .	10 „
Toppings or specks	8 „
Best pollard, Turkey p., or twenty-penny	15 „
Fine pollard	18 „
Bran and coarse pollard . .	50 „
Loss by evaporation and waste	11 „
	504 „

Comp. According to Vauquelin, French wheat flour contains about 10% of water, 11% of gluten, 71% of starch, 5% of sugar, and 3% of gum; and the water of the dough amounts to about 50%. The quantity of the bran in wheat ranges under 2%.

Pur. This article of food is very frequently adulterated both by the miller and the baker, as has been before alluded to in the article on bread. The principal physical characteristics of wheat flour of good quality are the following:—it has a dull white colour, somewhat inclining to yellow;—it exhibits no trace of bran, even when pressed smooth with the hand, or with a polished surface;—its cohesiveness is so great, that on being squeezed in the hand, the lump is some time before it loses its shape;—it has a homogeneous appearance, and does not lose more than from 6% to 12% by being carefully dried in a stove. The smaller the loss in this way the finer is the quality, other matters being equal, and the more economical in use. (See *below.*)

Tests. 1. Solution of ammonia turns pure wheat flour yellow; but if any other corn has been ground with it, pale brown; or if peas or beans have been ground with it, a still darker brown.

2. Solution of potassa, containing about 12% of caustic alkali, dissolves pure wheat-flour almost completely; but when it is adulterated with the flour of the leguminous seeds (beans, *peas, &c.*), the cellulose of these substances

remains undissolved, and its hexagonal tissue is readily identified under the microscope. Mineral substances (chalk, plaster of Paris, bone dust, &c.) are also insoluble in this test, and appear as a heavy white sediment.

3. Boiling water poured on the sample causes the evolution of the peculiar odour of pea or bean flour when these substances are present. Bread made with such flour evolves a like odour on being toasted.

4. Pure hydrochloric acid poured on potato flour, or on wheat flour adulterated with it, develops a smell of rushes; it also dissolves starch, but changes the colour of pure wheat-flour to a deep violet.

5. Nitric acid turns wheat flour of an orange-yellow colour, but forms a stiff and tenacious jelly with potato fecula, the colour of which it does not alter.

6. A portion of the suspected sample submitted to dry distillation in a stoneware retort, and the distillate collected in a receiver containing a little water, the latter is found to remain perfectly neutral if the wheat flour is pure, but acquires a distinctly alkaline reaction when beans, pulse, or pea meal is present. (Rodrigues.)

7. Triturate 300 grs. of the sample with an equal weight of clean siliceous sand, and after five minutes form a homogeneous paste with water; afterwards further adding more water, until about 2 fl. oz. have been used. The filtered liquid, treated with an equal quantity of a strong and pure aqueous solution of iodine, develops a pink colour, which gradually disappears, when the specimen examined consists of pure wheat flour; but assumes a deep-purple colour. which disappears much more slowly, if the flour is adulterated with even 10% of fecula or potato flour. This test succeeds, not only with flour and meal, but also with macaroni, vermicelli, &c. (M. Chevallier.)

8. The milky liquid holding the starch in suspension (see Anal., next col.) is poured into a small conical glass, and left at rest for some time; the clear liquid is then decanted, and any remaining water carefully sucked up with a pipette, and the whole left for some time, in order that the deposit may harden. The upper gray layer is next removed with a teaspoon, and the harder and stiffer second layer left undisturbed until it becomes quite solid by drying. When in this state, it may be upset in the form of a cone, upon a lump of dry plaster. The fecula or potato starch (if any is present), being heavier than that of wheat, forms the apex of the cone, and its quantity may be estimated in the following manner:—The operator cuts from the apex of the little cone above mentioned a slice, which he triturates only for a short time in an agate mortar (one of glass, or porcelain, or wedgwood-ware, will not do), and he tests that with aqueous solution of iodine. If it turns blue, it is fecula. Another slice is treated in the same manner, until the operator comes to the wheat starch, which, in t stance, is not affected by the of iodine. This difference of b two species of starch with iodi friction of the pestle and sufficient to divide or tear the particles of the potato star become blue when treated iodine. The particles of whea contrary, are not disaggregate ment, and being therefore pr envelope, are not acted upon b iodine, or, at most, assume onl (M. Robine.)

9. Wheat flour adulterated Paris, ground bones, chalk, has a higher specific gravity t the pure flour. This may b tained by any person, by fillin with some pure flour, and the sample. "A vessel which wi of wheat flour will contain 1 (potato flour), and hence "th this adulteration may be e (Ure.)

10. If to a sample of whea a solution of potassa, containi the pure alkali, the granules or of bean meal, or pea meal, will acquire 4 or 5 times their whilst those of the pure whea scarcely affected by it. This perceptible under a microscope 2 parts of liquor of potassa (Ph of distilled water form a mixtu for the above purpose.

11. By means of the mic mixture of the cheaper fec with wheat flour is readily characteristic appearance of th and when the adulteration exc its extent may be readily estim siderable accuracy. As the ran tion is generally from 12% to thod is applicable in the grea cases.[1]

Analysis. The value of wh aliment depends upon the qua sugar, starch, and phosphate of contains; and its superiority ov the grains of the other cereals its containing a larger proporti and last of these substances The quantitative analysis of simple, and may be easily made acquainted with chemistry, by instructions below:—

a. Make 1000 grs. of the dough with a little water, let it and then gently knead it in suc until the starchy particles are moved. Collect the portion (the hand, drain off the water, piece of filtering or blotting times doubled, and set it aside.

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[1] See also BREAD Adult. and

l waters employed in the
and set them aside in a
it the suspended portion
a sufficient time pour off
l throw the whole of the
ed paper filter, placed in a
o remove the portion ad-
m of the vessel by means
water, that none may be

decanted liquid, as well
the filter, until it becomes
through a piece of weighed
d preserve the sediment
evaporate the residuum to
a syrup, agitate it with 10
of alcohol, and filter, ob-
e paper filter clean with a
the solution has passed
substance on the paper is
x and GUM, and must be
sequent digestion in water,
poration, the two may be

distil off the spirit from
ashings, as above; the resi-

ances educed as above, by a
weigh them. The weight of
be taken with that of the
ses about the same nutritive
ause it has been asserted by
t the former substance is in
l not albumen. By dividing
by 10, the per-centage value
obtained. The pieces of fil-
ployed should be carefully
d before using them, and the
heat should be employed for
that to which they will be
ed in the drying of the sub-
from the operations.

re method of ascertaining the
any sample of flour as an ar-
ugh not strictly accurate, ap-
ciently to the truth for all
es, and is well adapted to the
ker and large purchaser. In
ll only be necessary to perform
f the process (*a*), which will
ntage of the most important
the flour; the rest being of
ce.

what has been already stated
n BREAD, it may be useful to
pound of the best flour, from
d wheat, will take 10 fl. oz. of
t into ordinary dough, or 9 fl.
nto bread dough. Under the
ry acts, a sack of flour (280 lbs.)
o produce 80 loaves (quartern
), the weight of which, within
being baked, was to be 4 lbs.
At the present time fully 92
4 lbs. each, are produced *by the*
from one sack of flour, when honest weight is given; but as the latter is rarely the case, and the bread is frequently 'slack' or 'under-baked,' and thus contains more water than good bread ought to do, a much larger product is commonly obtained. The dough loses about $\frac{1}{7}$th of its weight in baking, if in batches; but fully $\frac{1}{6}$th, if baked in small loaves, and placed in the oven separately. The best bread contains about $\frac{11}{46}$ths of its weight of added water; and common bread, often much more than $\frac{1}{4}$th. The proportion of water in the London bread has greatly increased during the last few years, owing to the introduction of the fraudulent plan of making the dough with rice jelly or moss jelly. This is the reason why the bread of some bakers suffers such a loss of weight in a few hours after being taken from the oven. A 4 lbs. loaf of bread purchased from a baker at Lambeth, after remaining on the sideboard of a sitting-room for 24 hours, was found to have lost no less than 6¼ oz. by evaporation, and in two days longer its interior cells were covered with green mould, and the whole was unfit for food. The bakers, aware of these facts, are particularly careful not to bake more bread than they can dispose of whilst 'new,' and are in the habit of refusing to weigh their bread before selling it, when it is more than 10 or 12 hours old, although they are liable to be 'fined' for such a refusal. See BREAD, CAKES, FARINA, &c., also *below*.

Flour, Baked. *Syn.* FARINA TOSTA, F. TRITICI TOSTA, L. *Prep.* From wheat flour, carefully baked in a 'slack' oven, until it acquires a pale-buff hue. Astringent; used to make food for infants troubled with diarrhœa. See FARINA.

Flour, Barley (Prepared). *Syn.* FARINA HORDEI PREPARATA, L. *Prep.* (Ph. Bor.) From barley flour, compressed into a tin cylinder until the vessel is 2-3rds full, which is then suspended at the upper part of a still 2-3rds filled with water, and after the 'head' is fitted on, the water is kept boiling for 30 hours (2 days of 15 hours each). Lastly, the upper layer being removed, the rest is reduced to powder, and kept in a dry place.

Flour, Boiled. *Syn.* TRITICINA, FARINA PREPARATA, L. *Prep.* From fine flour, tied up in a linen cloth as tight as possible, and after it has been frequently dipped into cold water, the outside of the cloth is dredged over with flour, until a crust is formed round it, to prevent the water soaking into it whilst boiling; it is then boiled for a long time, and when cold, it is divided into small oblong pieces. For *use*, it is reduced to powder, either by grinding or grating it, and is then prepared like arrow-root. It forms a good diet for children, in diarrhœa, &c.; and as it may be easily prepared at home, it has the advantage of being free from adulteration.

Flour, Jones's Patent. *Prep.* From *kiln-dried flour, 1 cwt.*; tartaric acid, 10¼ oz.; *mix thoroughly; after* 2 or 3 days, add, of bicarbonate of soda, 12 oz.; lump sugar, ½ lb.; common salt, 1¼ lb.; mix, and pass the compound through the 'dressing-machine.' It is necessary that the whole of the ingredients should be perfectly dry, and separately reduced to fine powder before adding them to the flour. By simply mixing it with cold water, and at once baking it, it produces light, porous bread.

Obs. We have already had occasion to pay a passing tribute to the excellence and usefulness of Jones's Patent Flour.[1] It is, indeed, invaluable in every household, as furnishing the means of producing, with great economy, and extemporaneously, not merely cakes, puddings, pastry, and fancy bread, but the 'staff of life' itself, household bread, of a purity, flavour, and lightness, seldom, if ever, met with in that purchased of the bakers.

Flour, Sewell's Patent.—*a.* (No. 1.) Flour, 1 sack (280 lbs.); hydrochloric acid (sp. gr. 1·14), 45 oz.; mix, by adding the acid in a 'spray.'—*b.* (No. 2.) To the last, add (expertly) bicarbonate of soda, 39 oz.; mix thoroughly, and pass the whole through a sieve or 'dressing machine.'

Obs. This flour is used as the last, to which, however, it is inferior in quality. No. 1 will keep 5 weeks. No. 2 will keep a month. Jones's flour will keep good in a dry place for years. If No. 1 is alone employed for the dough, to each pound of the flour, 63 grs. of bicarbonate of soda, with salt, q. s., must be added. The patentee claims for his invention the merit of the soda and acid being converted into culinary salt in the process of mixing up the flour and baking the dough.[1]

FLOWERS. *Syn.* FLORES, L. These beautiful and fragrant ornaments of our gardens and our dwellings are too highly esteemed by all classes of the community to require anything in favour of their cultivation to be said here. Our remarks will, therefore, chiefly refer to their collection, improvement, and preservation.

'Full' or 'double flowers,' or those in which the internal organs become petals, are so much more beautiful than the 'single flowers' of the corresponding species and varieties, that their production, with tolerable ease and certainty, has long been a desideratum with both the professional and amateur florist. Various plans have been proposed having this object in view, among which are the following:—1. The use of the best seed only, but not before it is at least 3 or 4 years old.—2. The selection of the outer row of seed only, and its careful preservation intact for at least 2 seasons before sowing it. We are assured that this method is particularly successful with dahlias.—3. The removal of the plants to a shady situation as soon as the flower-buds begin to develop themselves, and stinting them with water and nourishment for a few weeks. In this method a few only of the buds are permitted to mature; the rest being snipped off with a pai early as possible.—4. The use o a scanty supply of water until partly developed, when wate abundance, with or without t little liquid manure.

To hasten the 'blooming' o common practice with the ga them in as small pots as is cons healthy existence, and carefull planting them to larger pots, f before their usual time of blo on the point of flowering, if larger pot and a richer soil, in mences making roots and le embryo flowers either wholly develepment is checked until of their production has passed

The following liquid has been advantage to promote the vigo the early flowering of plant nitrate of ammonia, 4 oz.; ni 2 oz.; sugar, 1 oz.; hot water, and keep it in a well-corked put 8 or 10 drops of this liqui of a hyacinth glass or jar, for plants, changing the water days. For flowering plants in must be added to the wate them. The preference shoul rain water for this purpose. under the name of liquid gua in the same manner.

Flowers may be preserved in a considerable time, by keep moist atmosphere. When g parent stem, the large amount from the surface of their leaves for by an equivalent proporti supplied by the roots; but plucked, the evaporation from t tinues, while the supply of moi To supply, in part, this loss evaporation, has arisen the al practice of placing flowers in w mutilated stems possess a far in sucking up fluids to that of the their decay is only deferred fo preserve them more effectually render their existence less ephe surround them with a moist which the loss of water from their leaves will be reduced t possible amount. "It is now ago since we first saw, in the dr a gentleman, in the hot dry dog-days, flowers preserved da all their freshness by the followi trivance:—A flat dish of porce poured into it. In the water a was set; over the whole a bell-g with its rim in the water. This case' in principle, although diffe struction. The air that surround being confined beneath the bell-g constantly moist with the wat

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[1] See UNFERMENTED BREAD.

vapour. As fast as the water
t ran down the sides of the
nto the dish; and if means
to inclose the water on the
ell-glass, so as to prevent its
the air of the sitting-room,
round the flowers would have
ally damp. We recommend
to see plenty of fresh flowers
ooms in dry weather to adopt
he experiment can be tried by
ler over a rose-bud in a saucer
rdener's Chron.')

d by which some flowers may
many months is to carefully
on as gathered, in perfectly
r, and after allowing them to
minutes, to set them upright,
in the usual manner in an
he gum gradually forms a
ing on the surface of the
s, and preserves their figure
after they have become dry

may be generally more or less
rsing them half-way up their
t water, and allowing them to
il it cools, or they have reco-
lled portion of the stems must
nd the flowers placed in clean
this way a great number of
ay be restored, but there are
e fugacious kinds, on which it

e produced in winter by taking
ees, or shrubs, in the spring, at
they are about to bud, with
own soil carefully preserved
s, and placing them upright in
haelmas; when, with the addi-
rth, they are to be put into
essels, and placed in a stove or
they must be treated in the
By this method, in the month
fruits or roses will appear.
n pots about Michaelmas may
o bloom at Christmas.

tly instantaneous flowering of
d a few years ago by M. Her-
onished audience, was, we be-
by the heat generated by frag-
klime concealed in the mould
ot in immediate contact with,
plants selected by M. Herbert—
raniums and a rose tree—were
o rather deep boxes of garden
ere covered with glass shades.
ommenced by pouring over the
small watering-pot, a liquid
to the ingredients already in
ed a great heat, as was shown
steam or vapour, which was
the shades, and allowed, to
escape through a small hole in
at first was kept closed. The
geraniums was *certainly almost* instantaneous: the buds beginning to burst in about five or six minutes, and the plants being in full bloom within ten minutes, when the blossoms were gathered by M. Herbert, and distributed amongst the ladies present. With the rose tree the exhibitor was less fortunate. The invention may prove useful where ladies require to decorate their drawing-rooms or boudoirs with the beauties of the floral world somewhat earlier in the season than they can otherwise be obtained. It must not, however, be forgotten that the plants are, as it were, parboiled during the process, and die after a few days.

The collection and preservation of flowers for medicinal purposes and distillation, will be found noticed under VEGETABLE SUBSTANCES.

Flowers, Artificial. The beauty and value of these pleasing articles of personal decoration mainly depend upon the taste and ingenuity of the maker. The delicate fingers of woman, and her ready powers of imitation and invention, combined with her natural affection for the chaste and beautiful, have enabled her the more especially to excel in this manufacture. The productions of the female artificial florists of the French capital are justly admired everywhere.

The French employ velvet, kid,' and fine cambric for the petals, and taffeta for the leaves. Very recently thin plates of bleached whalebone have been used with great success for some portions of artificial flowers.

As colours and stains, the following are employed in Paris:—

BLUE. Indigo dissolved in oil of vitriol, and the acid partly neutralised with salt of tartar or whiting.

GREEN. A solution of distilled verdigris.

LILAC. Liquid archil.

RED. Carmine dissolved in a solution of salt of tartar, or in spirits of hartshorn.

VIOLET. Liquid archil, mixed with a little salt of tartar.

YELLOW. Tincture of turmeric.

The above colours are usually applied to the petals with the finger.

Flowers. *Syn.* FLORES, L. Among chemists, this term is applied to various pulverulent substances obtained by sublimation, as flowers of antimony, benzoin, zinc, sulphur, &c. The term has been discarded from modern chemical nomenclature, but is still commonly employed in familiar language and trade.

FLUID CAM'PHOR. *Prep.* (Sir J. Murray.) From camphor (in powder), 1 dr.; freshly precipitated carbonate of magnesia, 2 drs.; cold distilled water, 1 pint; the solution is effected by forcing in carbonic acid gas under pressure. Each fl. oz. contains 3 grs. of camphor, and 6 grs. of carbonate of magnesia. See ESSENCE OF CAMPHOR.

FLUID MAGNE'SIA. *Syn.* LIQUOR MAGNESIÆ CARBONATIS, L. M. BICARBONATIS, L. *The preparations* sold under this name are mere solutions of freshly precipitated carbonate of magnesia in water, formed by means of carbonic acid gas, under powerful pressure, and long agitation. Those best known are Sir J. Murray's and Mr. Dinneford's, each fl. oz. of which are said to contain about 17½ grs. of the carbonate, but their actual richness in the latter seldom exceeds 10 or 12 grs., and by the time they reach the consumer is often as low as 5 or 6 grs. Recently precipitated carbonate of magnesia placed in a bottle or other suitable vessel, which is then filled by means of a soda-water apparatus with water fully charged with carbonic acid gas, readily dissolves on slight and cautious agitation, and the aerated water becomes saturated with magnesia. A scruple of carbonate of magnesia put into a soda-water bottle, and thus treated, is all taken up in from 20 minutes to half an hour, and the beverage continues beautifully clear.

FLUM'MERY. A species of thick hasty-pudding made with oatmeal or rice, flavoured with milk, cream, almonds, orange flowers, lemons, &c., according to fancy.

Prep. 1. (DUTCH FLUMMERY.) From blancmange and eggs, flavoured with lemon peel and sweetened with sugar.

2. (FRENCH FLUMMERY.) From equal parts of blancmange and cream, sweetened, and flavoured. The above are poured into forms, and served cold, to eat with wine, spirit, cider, &c.

3. (A. T. Thomson.) Take oatmeal or groats, 1 quart; rub it for a considerable time with hot water, 2 quarts; and let the mixture stand until it becomes sour; then add another quart of hot water, and strain through a hair sieve. Let stand till a white sediment is deposited, decant the fluid portion, and wash the sediment with cold water. This is now to be boiled with fresh water, until it forms a mucilage, stirring the whole time. A light and nutritious food, during early convalescence.

FLUOHYDRIC ACID. See FLUORIDE OF HYDROGEN.

FLU'ORIDE OF HYDROGEN. HF. *Syn.* FLUOHYDRIC ACID; HYDROFLUORIC ACID; A. HYDROFLUORICUM, L. An acid composed of hydrogen and fluorine. It was discovered by Scheele, but was first obtained in a pure state by Gay-Lussac and Thénard, in 1810.

Prep. Pour concentrated sulphuric acid on half its weight of fluor spar, carefully separated from siliceous earth, and reduced to fine powder, The mixture must be made in a capacious leaden retort, and a gentle heat only applied, and the evolved gas must be collected in a leaden receiver, surrounded by ice.

Prop., &c. A colourless fluid below 59° Fahr., which speedily evaporates in dense white fumes when exposed to the air. Its affinity for water exceeds that of sulphuric acid, and its combination with that fluid is accompanied with a hissing noise, and a considerable increase of its sp. gr. up to a certain point. It attacks glass and silica, for which reason
preserved in glass vessels. Bot
silver, platinum, or pure gutta
used to keep it in. It is highly
stantaneously destroying the skin
and producing deep and serious
its vapour is pungent, irritating,
and poisonous. With the bases
form FLUORIDES.

In the arts, hydrofluoric acid
etching on glass.

FLU'ORIDES. Compounds of
metals and other basic radicals. T
of the metals are, with the exceptio
of the alkaline metals, insoluble
while the fluorides of hydrogen,
silicon, are gaseous, condensing at a
perature to volatile liquids.

FLU'ORINE. F. *Syn.* FLUO
An element that has not yet been
owing to its attacking and combi
every element or compound that at
been exposed to it, except oxygen.
sumably gaseous, and of a pale gr
low colour.

FLU'OSILICIC ACID. *Syn.* FL
SILICON AND HYDROGEN; HYDRO
ACID. *Prep.* From powdered fluor
siliceous sand or powdered glass, of
part; concentrated sulphuric acid,
mix in a glass retort, apply a gentle
pass the evolved gas into water th
layer of mercury. Decomposition
being deposited in a gelatinous state,
drofluosilicic acid or fluosilic acid re
solution. The acid liquor is used as a
potassium and barium, with whose
yields nearly insoluble precipitates.

FLUX. *Syn.* FLUXUS, FLUOR,
medicine, a term formerly applied to
diseases attended with a copious disc
diarrhœa (FLUX), dysentery (BLOODY
English cholera (BILIOUS FLUX),
(WHITE FLUX), &c. These terms are
rent among the vulgar.

Flux. In metallurgy, &c., a term appli
various substances of easy fusibility, which
added to others which are more refractory
promote their fusion.

Prep. 1. (BLACK FLUX.) Nitre, 1
crude tartar or cream of tartar, 2 parts;
and deflagrate, by small quantities at a
in a crucible, heated to dull redness.
product consists of carbonate of potassa,
with charcoal in a finely divided state.
for smelting metallic ores. It exercises
ducing action, as well as promotes the
It must be kept in a dry corked bottle.

2. (CHRISTISON'S FLUX.) Carbo
soda (cryst.), 8 parts; charcoal (in fine
1 part; heat the mixture gradually to
For reducing arsenic.

3. (CORNISH REDUCING FLUX.) Cr
tar, 10 parts; nitre, 4 parts; borax,
triturate together.

4. (CORNISH REFINING FLUX.

artar and nitre, equal parts,
ber. See Black Flux.
ux.) Same as black flux,
agration. Reducing.
's flux.) Carbonate of po-
rts; cyanide of potassium, 1
senical compounds.
flux.) Carbonate of soda
le, of potassium, equal parts.
Arsenious Acid.
s reducing flux.) Pow-
from lead), 8 parts; calcined
al, of each, 1 part; all in fine
turated well together. *Used*

ux.) See *above*.
for enamels.) See Enamels.
Borax, tartar, nitre, sal-am-
n salt, limestone, glass, fluor
l other substances, are used as
urgy.
e large scale, crude tartar is
preparation of fluxes; on the
mercial cream of tartar or bi-
ssa.
ommon house-fly (*Musca do-*
considerable annoyance to the
weather, as well as damage to
niture, especially to picture
, and the like. The best way
them is to expose on a plate
the mixtures given under Fly
). The blow-fly (*Musca vomi-*
her insects, may be kept from
t by dusting it over with black
ed ginger, or any other spice,
ing a piece of paper to it on
or two of creasote has been
spices may be readily washed off
fore dressing the meat.
not generally known, that flies
through a netting made of fine
r wire, even though the meshes
ch apart, unless there is a window
nd it. This affords us a ready
luding these insects from all our
hich have windows only on one
, without keeping the latter
is merely necessary to have an
etting stretched across the open-
lthough flies may abound on the
e will venture into the room so
If, however, there is a window on
ide of the room, they will fly
netting immediately. See *below*.
. Those papers which, a few
were sold about the streets of
harsh-voiced cries of "Catch 'em
d which might be seen in many
s covered with dead and dying
repared by rubbing factitious bird-
heets of paper. It would be diffi-
sive a more cruel or more offensive
hing flies than that of glueing their
s to an adhesive surface. A pre-
l of fly-paper is that called 'papier

mouré,' which contains a large quantity of arsenic in its substance. This paper is kept wet when in use, and the flies, by sipping the moisture, are poisoned.

Fly Poison. *Prep.* 1. A strong solution of white arsenic (say 1 dr. to the pint), sweetened with moist sugar, treacle, or honey. Sold under the name of 'Fly water.'

2. Treacle, honey, or moist sugar, mixed with about $\frac{1}{12}$th their weight of King's yellow or orpiment.

Obs. Both the above are dangerous preparations, and should never be employed where there are children.

3. (Redwood.) Quassia chips (small), ½ oz.; water, 1 pint; boil 10 minutes, strain, and add of treacle, 4 oz. "Flies will drink this with avidity, and are soon destroyed by it."

4. Black pepper, 1 teaspoonful; brown sugar, 2 teaspoonfuls; cream, 4 teaspoonfuls. See *below*.

Fly Powder. The dark gray-coloured powder (so-called 'sub-oxide') obtained by the free exposure of metallic arsenic to the air. Mixed with sweets, it is used to kill flies.

Fly Water. See Fly Poison (*above*).

FOILS. These are thin leaves of polished metal, placed under precious stones and pastes, to heighten their brilliancy, or to vary the effect. Foils were formerly made of copper, tinned copper, tin, and silvered copper, but the last is the one wholly used for superior work at the present day.

Foils are of two descriptions:—white, for diamonds and mock diamonds, and—coloured, for the coloured gems. The latter are prepared by varnishing or lacquering the former. By their judicious use the colour of a stone may often be modified and improved. Thus, by placing a yellow foil under a green stone that turns too much on the blue, or a red one under a stone turning too much on the crimson, the hues will be brightened and enriched in proportion.

Prep. 1. (Crystal, Diamond, or White foil.)—*a*. This is made by coating a plate of copper with a layer of silver, and then rolling it into sheets in the flatting mill. The foil is then highly polished, or covered with crystal varnish.

b. The inside of the socket in which the stone or paste is to be set is covered with tin foil, by means of a little stiff gum or size; when dry, the surface is polished and the socket heated, and whilst it is warm, filled with quicksilver; after repose for two or three minutes, the fluid metal is poured out, and the stone gently fitted in its place; lastly, the work is well-fitted round the stone, to prevent the alloy being shaken out.

c. The bottom of the stone is coated with a film of real silver, by precipitating it from a solution of the nitrate in spirit of ammonia, by means of the oils of cassia and cloves.[1] This method vastly increases the brilliancy both of real and factitious gems, and the work is very permanent.

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[1] See Silvering.

2. (COLOURED FOILS.) The following formulæ produce beautiful coloured effects, when judiciously employed:—

a. (Amethyst.) Lake and Prussian blue, finely ground in pale drying oil.

b. (Blue.) Prussian blue (preferably Turnbull's), ground with pale, quick-drying oil. *Used* to deepen the colour of sapphires.

c. (Eagle marine.) Verdigris tempered in shell-lac varnish (alcoholic), with a little Prussian blue.

d. (Garnet.) Dragon's blood dissolved in rectified spirit of wine.

e. (Vinegar garnet.) Orange lake finely tempered with shellac varnish.

f. (Green.)—*α.* From pale shell-lac, dissolved in alcohol (lacquer), and tinged green by dissolving verdigris or acetate of copper in it.

β. From sesquiferrocyanide of iron and bichromate of potassa, of each, ½ oz.; ground to an impalpable powder, first alone, and then with gum mastic (clean and also in fine powder), 2 oz.; a little pyroxilic spirit is next added, gradually, and the whole again ground until the mass becomes homogeneous and of a fine transparent green. The beauty increases with the length of the grinding. The predominance of the bichromate turns it on the yellowish green; that of the salt of iron, on the bluish green. For use it is to be thinned with pyroxilic spirit. ('Chem.,' iii, 231.) *Used* for emeralds.

g. (Red.) Carmine, dissolved in spirit of hartshorn, or in a weak solution of salt of tartar, and a little gum (dissolved) added.

h. (Ruby.)—*α.* From lake or carmine, ground in isinglass.

β. Lake ground in shell-lac varnish. Both are used when the colour turns on the purple.

γ. From bright lake ground in oil. *Used* when the colour turns on the scarlet or orange.

i. (Yellow.)—*α.* Various shades of yellow may be produced by tinging a weak alcoholic solution of shell-lac or mastic, by digesting turmeric, annotta, saffron, or socotrine aloes in it. The former is the brightest, and is used for topazes.

β. From hay saffron digested in 5 or 6 times its weight of boiling water until the latter becomes sufficiently coloured, and a little solution of gum or isinglass added to the filtered liquor. When dry, a coating of spirit varnish is applied.

Obs. By the skilful use of the above varnishes, good imitations of the gems may be cheaply made from transparent white glass or paste; and by applying them to foils set under coloured pastes (FACTITIOUS GEMS), a superior effect may be produced. The pigments employed must be reduced to the finest state possible by patient grinding, as without this precaution transparent and beautiful shades cannot be formed. The palest and cleanest
mastic and lac, dissolved in alco
the palest and quickest drying oi
be used when these substances
In every case the colour must b
foil with a broad soft brush; a
tion should be performed, if pos
as no part should be crossed, o
over, whilst wet. If the colour
pale, a second coat may be giv
first one has become quite dry, l
tice should be avoided if possibl

FOMENTATION. *Syn.* FOM
MENTUM, FOTUS, L. A liquid,
or medicated, used for local bath
tations are distinguished from l
in being applied in a heated
larger quantities, and for a long
time.

Fomentations are chiefly emp
pain or irritation, or to promot
or the healthy action of the p
intention is to convey heat, o
moisture, to the part fomente
care must be taken to manage t
so as to promote the object in vi
possible. Flannel cloths wrun
hot or boiling liquid, by means
turned in opposite directions,
vehicles for fomentations. If th
up, and laid lightly over the part
a considerable quantity of air, w
bad conductor, retains the heat i
considerable time. "In every
menting there should be two f
(say) three yards long, with th
together, to admit of the boiling
wrung out of them; and the one
be got ready whilst the other is
fineness or the coarseness of the
a matter of indifference. The
the less readily does it conduct
longer it retains its warmth; t
more efficient for fomenting.
also retains the heat longer t
flannel." (Dr. R. E. Griffith.)
than good is frequently done by
patient to become chilled durin
cation. "If only one (flannel)
skin becomes chilled during the
in removing the flannel, soakin
water, wringing it out, and r
but if two are used, one of them
can be applied the moment the
off, by which means the part is
to the air, no matter how long
tion is continued. In some dise
tism, peritonitis, &c.), the patien
conscious of a degree of heat whi
nurse's hands. In this case t
flannels should be put in a tow
means they may be wrung out w
handled by the nurse, and may b
hotter than can be done by any ot
(Dr. J. B. Nevins.)

The quantity of liquid forming
tion, as well as the size of the cl

depend upon circumstances. In
in slight affections of the face,
ication may be effectually made
part in the steam of the hot
thing it continually by means of
loth. In some instances ½ pint
quid may be found a sufficient
ilst in others, several quarts will
Under all circumstances, care
to keep the fomentation as near
the temperature ordered, during
of its application; and, as soon
on is finished, to quickly wipe the
to cover it with ample clothing,
the reaction set up may not be
hecked.
ns usually consist of simple water,
on of some simple vegetable sub-
momiles, elder flowers, or mallows;
ally, the leaves and flowers of
narcotic plants, and saline matter,
under this form. The following
iven as examples:—
, **An'odyne.** *Syn.* Fotus ano-
ntatio anodyna, Fomentum
. *Prep.* 1. Simple decoction of

F.) Poppy-heads (without the
water, 3½ pints; boil to 2½ pints;
lowers, ¾ oz.; boil to a quart, and
to allay pain.
n.) Opium, 1 oz.; wine, 1 quart;
t and strain. Used in severe
atic, neuralgic, and syphilitic

1 oz.; water, 1 quart; boil to
yroligneous acid, 2 fl. oz.; boil for
nger, then further add of sherry
; and as soon as the whole again
it for use. Superior to the last,

, Antineural'gic. *Syn.* Fomen-
neuralgica, L. *Prep.* 1. (Mialhe.)
morphia, 2 gr.; acetic acid, 2 or 3
de Cologne, 2 or 3 dr.; dissolve. In
algia.
sseau and Reveil,) Cyanide of po-
dr.; distilled water, 6 fl. oz.; dissolve,
it in a well-closed bottle in the dark.
uralgia, especially in that of the face
ureux). A compress of lint or soft
ipped in it and applied to the part.
not be used internally or applied to a
surface, as it is very poisonous. See
Fomentations, Nos. 3 and 4 (above),
ulant Fomentation.
tion, Antiseptic. *Syn.* Fomentatio
ica, L. *Prep.* 1. Decoction of mal-
; sal ammoniac, 2 oz.; dissolve, and
sulphate of quinine, 20 gr., dissolved
ctified spirit, 4 fl. oz.
p. F.) Decoction of bark, 1 quart;
of chamomile, 1 pint; camphorated
l oz.; hydrochloric acid, 1 fl. dr. Both
when there is a tendency *to gangrene*

Fomentation of Ar'nica. *Syn.* Fomentatio arnicæ, L. *Prep.* 1. Flowers of arnica, 1 oz.; water, 3 pints; boil to a quart, and strain. *Used* in contusions.

2. (Graefe.) Flowers of arnica, 2 oz.; rue (leaves), 1 oz.; boiling water, q. s. to strain 12 fl. oz. of infusion after an hour's maceration at nearly the boiling temperature. *Used* in contusions and extravasations, especially as an application to black eyes.

3. (Radius.) Flowers of arnica, ½ oz.; boiling vinegar, q. s. to strain 6 fl. oz. of infusion, in which dissolve of carbonate of ammonia, 2 dr. *Used* in œdema of the scrotum.

Fomentation, Aromat'ic. *Syn.* Fomentatio aromatica, Fotus aromaticus, L. *Prep.* 1. Sea wormwood, southernwood, and chamomiles, of each, 1 oz.; laurel leaves, ½ oz.; water, 5 pints; boil to ½ gall., and strain. In rheumatism, cutaneous affections, colic, &c.

2. (Augustin.) Rosemary, ½ oz.; red wine and water, of each, 3 fl. oz.; infuse and strain with expression. In contusions, especially black eyes.

3. (Hosp. F.) Cloves and mace, of each, 1 oz.; opium, 20 gr.; red wine (boiling), 1 pint; digest at near boiling for 1 hour, and strain. *Used* as both the last.

4. (Rideau.) Bay leaves, rosemary, southernwood, and wormwood, of each, 1 oz.; water, 2 quarts; boil 5 minutes, and strain. As No. 1.

Fomentation, Astrin'gent. *Syn.* Fotus astringens, F. roborans, L. *Prep.* 1. Decoction of oak bark.

2. To each quart of the last, add of alum, 1 dr.

3. (Ph. Chirur.) Bruised galls, 1 oz.; boiling water, 2½ pints; digest 1 hour, and strain.

4. (Ricord.) Tannin, 2½ dr.; aromatic wine (hot), ½ pint; dissolve.

5. Bistort and pomegranate peel, of each, 2 oz.; sal ammonia, ½ oz.; red wine 1 pint; infuse at a gentle heat. The above are used in hæmorrhages, piles, prolapsus, &c.

Fomentation of Belladon'na. *Syn.* Fotus belladonnæ, L. *Prep.* (Ophthalmic Hosp.) Extract of belladonna, 1 dr.; boiling water 1 pint. *Used* to dilate the pupil in certain affections of the eye; it is usually applied on the forehead.

Fomentation of Cham'omile. *Syn.* Fomentatio anthemidis, L. *Prep.* Chamomiles, 2 oz.; water, 3 pints; boil 10 minutes, and strain with expression. Emollient.

Fomentation, Diuret'ic. *Syn.* Fomentatio diuretica, L. *Prep.* (Trousseau.) Tinctures of squills and foxglove, of each, 2 oz.; hot water, 6 fl. oz.; mix. Applied by lint or linen compresses to the insides of the thighs, in dropsies, when the stomach will not bear diuretics.

Fomentation of El'der Flowers. *Syn.* Fotus sambuci, L. *Prep.* From elder flowers, 1 oz.; boiling water, 2 quarts; digest in a hot place for 1 hour, and express the liquor. Emollient.

Fomentation, Emol'lient. *Syn.* FOMENTATIO EMOLLIENS, L. *Prep.* 1. Marshmallow root and poppy-heads, of each 1 oz.; water, 3 pints; boil to a quart, and strain.

2. (P. Cod.) Emollient herbs, 1 oz.; boiling water, 1 quart; infuse 1 hour, and strain with expression. (See above.)

Fomentation, Narcot'ic. *Syn.* FOMENTATIO NARCOTICA, L. *Prep.* (P. Cod.) Narcotic herbs, 1 oz.; boiling water, 1¼ pint; infuse as last.

Fomentation, Resol'vent. *Syn.* FOTUS RESOLVENS, L. *Prep.* (Richard.) Fomentation of elder flowers, 8 fl. oz.; liquor of diacetate of lead, ½ fl. dr.; mix. *Used* to discuss tumours, &c.

Fomentation, Stim'ulant. *Syn.* FOMENTATIO STIMULANS, L. *Prep.* 1. Sesquicarbonate of ammonia, 1 oz.; tincture of cantharides, 2 fl. oz.; warm water, 1 pint.

2. Household mustard, 4 oz.; hot water, 1½ pint; mix. Both the above are rubefacient and counter-irritant, and excellent in rheumatism, neuralgia, &c.

Fomentation, Ver'mifuge. *Syn.* FOMENTATIO VERMIFUGA, FOTUS ANTHELMINTICUS, L. *Prep.* Leaves and flowers of tansy, wormwood, and chamomile, of each, 3 oz.; water, 1 quart; boil to 1½ pint, and strain. Applied to the abdomen, &c., in worms.

FOOD. *Syn.* CIBUS, MATERIA ALIMENTARIA, L. Anything which feeds or promotes the natural growth of organic bodies, by supplying them with materials which, by assimilation, may be converted into the substances of which they are composed; or which, by its decomposition or slow combustion, maintains the temperature, or some other essential condition of life, at the proper standard. The numerous articles employed as food are all compounds; and in many cases they consist of mechanical mixtures or chemical combinations of two or more compounds. Organized matter, or that which has possessed either animal or vegetable life, or which has been produced by living organs, seems to be alone capable of assimilation, to any extent, by the animal system; and hence it is from the organic kingdom that our aliments are necessarily derived. Water, iron, earthy phosphates, chloride of sodium, and other salts, which form the inorganic constituents of the body, though not of themselves nourishing, are also assimilated when taken in conjunction with organic aliments, and then contribute essentially to nutrition. In the animal and vegetable substances employed as food, these inorganic compounds are provided in small but sufficient quantities to meet the requirements of the healthy body; and in this state of combination alone can they be regarded in the light of aliments. A complete consideration of this subject embraces, not only all the substances used as food, but also those things which when taken with them improve thei
mote their digestion, and read
wholesome and nutritive; and
paration for the table in its va
with health and disease.

The following 'BILLS OF FA
we are indebted chiefly to Soye
others, exhibit the various artic
different periods of the year.

FIRST QUARTER. January.-
Game: Pheasants, partridges,
woodcocks, snipes, turkeys, c
fowls, chickens, and tame p
Carp, tench, perch, lampreys,
cod, soles, flounders, plaice, tur
skate, sturgeon, smelts, whit
crabs, prawns, and oysters.—Ve
bage, savoys, colewort, sprouts,
beet, sorrel, chervil, endive,
garlic, scorzonera, potatoes, pa
brocoli (white and purple), sh
cresses, mustard, rape, salsafy,
all sorts (some dry and some g
bers, asparagus, and mushrooms
had, though not in season.—
pears, nuts, walnuts, medlars, an

February and March.—Mea
game, as in January, with th
ducklings and chickens.—Fish
two months. (Cod is not tho
from February to July, althou
sold at the fishmonger's.)—Ve
same as the previous months, w
tion of kidney-beans.—Fruit:
and forced strawberries.

SECOND QUARTER. April, Ma
—Meat: Beef, mutton, veal, lam
(in June).—Poultry: Pullets, fo
ducklings, pigeons, rabbits, an
Fish: Carp, tench, soles, smelts
turbot, lobsters, chub, salmon, h
fish, mackerel, crabs, prawns, an
Vegetables: As before; and in
potatoes and cabbages, peas, radi
beans, carrots, turnips, cauliflowe
artichokes, and numerous salad
Fruit: (in June), strawberries, che
green apricots, and currants and
for tarts; pears, grapes, nectari
and some other fruit.

THIRD QUARTER. July, Aug
tember. — Meat, as before. —
Pullets, fowls, chickens, rabbits,
geese, leverets, and turkey
former months, plovers and w
September), partridges, geese, &c.
haddocks, flounders, plaice, skat
mullets, pike, carp, eels, she
oysters), and mackerel (during
months of the quarter, but they
in August).—Vegetables: Of al
peas, French-beans, &c. — Frui
strawberries, gooseberries, pine-
(various), cherries, apricots, raspb
currants, and damsons. (In Au
tember), peaches, plums, figs,

apples, pears, nectarines, and
ng the latter months), pines,
berries, medlars, and quinces.
·), Morella cherries, damsons,
ms.

:ARTER. October, November,
·.—Meat, as before, and doe
ltry and Game: Domestic fowls,
arter; pheasants (from the 1st
partridges, larks, hares, dot-
end of the month), wild-ducks,
widgeon, and grouse.—Fish:
, pike, perch, halibuts, brills,
rout, barbel, gudgeons, tench,
—Vegetables: (As in January),
last crops of beans, &c.—Fruit:
, figs, bullace, grapes, apples,
ons, filberts, walnuts, nuts,
es, and medlars. (In Novem-
c.: Beef, mutton, veal, pork,
oe venison, and poultry and
he last month.—Fish: As the
Vegetables: Carrots, turnips,
oes, skirrets, scorzonera, onions,
bbage, savoys, colewort, spinach,
rdoons, cresses, endive, celery,
herbs, and various pot-herbs.—
apples, nuts, walnuts, bullace,
llars, and grapes. (In Decem-
c.: Beef, mutton, veal, house-
d venison.—Poultry and Game:
, pullets, pigeons, capons, fowls,
its, hares, snipes, woodcocks,
ts, partridges, sea-fowls, guinea-
lucks, teal, widgeon, dotterels,
d grouse.—Fish: Cod, turbot,
, gurnets, sturgeon, carp, gud-
s, eels, dories, and shell-fish.—
As in last month. Asparagus, &c.,
t: As before, except bullace.

oks give this name to a species of
f boiled and crushed fruit, mixed
cream, and sweetened.

l. From the peeled and cored
in a jar, with moist sugar, q. s. to
latable, and a very little cider or
jar is set in a saucepan of water
, and the heat continued until the
e quite soft, when they are pulped
lander, and a sufficient quantity
tle cream, and some sugar, added
to the proper 'palate.'

y Fool. From gooseberries, as the
which are unripe are generally
These preparations, when nicely
y pleasant and wholesome.

man.) See FEET.

Coarse moist sugar. The scrapings
r hogsheads, refuse sugar, waste,
also sold to the publicans under
who use it in the adulteration of
chiefly to make it stand more
o impart 'briskness.'

EAT. *Syn.* FARCE, STUFFING. A
ge meat, either served up alone,
as an ingredient in other dishes. Mrs. Rundell truly remarks that "at many tables, where everything else is done well, it is common to find very bad forcemeat or stuffing." To avoid this error, care should be taken to so proportion the ingredients that "no one flavour should predominate; yet if several dishes be served the same day, there should be a marked variety in the tastes of the forcemeats, as well as of the gravies. A general fault is, that the tastes of lemon-peel and thyme overcome all others; therefore they should only be used in small quantities." Forcemeats should be just consistent enough to cut with a knife, but not dry and heavy. Herbs are very essential ingredients; and it is the copious and judicious use of them that chiefly gives the cookery of the French its superior flavour. "To force fowls, meat, &c., is to stuff them." (Mrs. Rundell.)

FOR'CING. Horticulturalists apply this term to the art of accelerating the growth of plants, so as to obtain fruits or flowers at unusual seasons. Dung-beds, bark-beds, and frames, pits, and houses, with glass roofs, are commonly employed by the gardeners for this purpose.

FORMATE. *Syn.* FORMIATE. Salts, in which one atom of hydrogen in formic acid is replaced by a metal or other basic radical. They are best obtained either by direct saturation of the acid, or by double decomposition; most of them are very soluble, and are decomposed by hot oil of vitriol. Formate of ammonium crystallises in square prisms; formate of sodium, in rhombic prisms; formate of potassium is deliquescent, and crystallises with difficulty; the formates of barium, calcium, magnesium, and strontium, form small prismatic crystals; formate of lead assumes the shape of small colourless needles, soluble in 40 parts of water; the formates of cobalt, iron, manganese, nickel, and zinc, are easily crystallisable, whilst that of copper forms very beautiful, large, bright-blue rhombic prisms; formate of silver is less soluble than the salt of lead, and is decomposed at a gentle heat.

FORMIC ACID. $HCHO_2$. *Syn.* HYDROGEN FORMIATE. An organic acid, obtained by oxidizing many organic substances, and found in the red ant.

Prep. Sugar, 1 part; water, 2 parts; binoxide of manganese, 3 parts; mix in a retort capable of holding fully 10 times the bulk of the ingredients, and add, cautiously, oil of vitriol, 3 parts, diluted with an equal weight of water; as soon as the first violent effervescence has subsided, heat may be applied, and the product collected and purified, as below.

Formate of lead in fine powder is introduced into a long glass tube, one end of which is connected with an apparatus evolving sulphuretted hydrogen, and the other with a *receiver. As soon* as the salt is entirely de*composed* (blackened) a very gentle heat is applied, and the distilled liquid collected; the product is, lastly, boiled for a minute or less, to expel any adhering sulphuretted gas. This furnishes chemically pure formic acid.

From wood spirit, 1 part; bichromate of potassium and sulphuric acid, of each, 3 parts; the sulphuric acid, diluted with an equal weight of water, being gradually added last. A portion of wood spirit distils over with the acid, and may be again treated with bichromate of potassium and sulphuric acid, when a fresh portion of formic acid will be produced. This process yields a large product.

Prop., purific., &c. The products of the above processes are limpid and colourless; the stronger ones fume slightly in the air, and possess an extremely penetrating odour. The acid obtained by the second process boils at 209° Fahr., crystallises in brilliant scales below 32°, and has the sp. gr. 1·2353. Its vapour is inflammable, and burns with a blue flame. It is extremely corrosive, and rapidly destroys the texture of living organic substances. The products of the other processes are very dilute, and possess the above properties in only a minor degree. They may all be purified and concentrated by saturating them with pure carbonate of sodium or of potassium, and after subjecting the liquid to a gentle heat for a short time, and liberating the formic acid from the salt by means of dilute sulphuric acid, finally submitting the mixture to distillation, when the hydrated acid will come over perfectly pure.

Formic acid reduces the salts of mercury and silver, and forms salts with the bases termed formiates.

Formic acid is readily distinguished from acetic acid, which in many points it resembles, by heating it with a little solution of oxide of silver or mercury; the metal is reduced, and precipitated in a pulverulent state, while carbonic acid is extricated. The odours of the two acids also vary.

FORM'ULA. [L.] In pharmacy and medicine, a short form of prescription; a recipe. By chemists, the term is applied to a grouping of symbols, expressing the composition of a body; thus, HCl (standing for 1 atom of hydrogen united to 1 atom of chlorine) is the formula for hydrochloric acid. A chemical formula is termed empirical when it merely gives the simplest possible expression of the composition of the substance to which it refers. A rational formula, on the contrary, aims at describing the exact composition of molecule, or combining weight of the substance, but stating the absolute number of atoms of such of the elements essential to that object, as well as the mere relations existing between them. The empirical formula is at once deduced from the analysis of the substance, reckoned to 100 parts; the rational formula requires, in addition, a knowledge of its combining quantity, which can only be obtained by direct experiment, by synthesis, or by the careful examina-
tion of one or more of its most
pounds. Thus, the composition
is expressed by the formula C
hibits the simplest relations
elements; if we want to express
of these, in atoms required to
molecule of acetic acid, we ha
formula $C_2H_4O_2$ or $HC_2H_3O_2$.

FOR'MYL. *Syn.* Formyle.
organic radical, having the co
Its existence was inferred from
tion of certain organic compou
now referred to the methyl-
acid was supposed to be an ox
and chloroform, the terchloride

FOX GLOVE. *Syn.* Digita
A genus of plants belonging
order *Scrophulariaceæ.* The
uncultivated '*Digitalis purpu*
foxglove are officinal in our
They must be gathered befor
flowers have expanded. "Th
midrib of the leaf being e
lamina." (Ph. L.) The seeds
mina), which were ordered, a
leaves, in former pharmacopœi
be in many points preferable to
good, the leaves are of a dull
and possess a feeble narcotic odo
unpleasant taste. Both the dr
the powder should be preserv
bottles covered with dark-colo
in well-closed tin canisters, and
cupboard; and the stock shoul
yearly, as age considerably dimi
dicinal activity of digitalis.

Action, uses, &c. Foxglove is di
and antispasmodic, and exerts a
over the cerebro-spinal system,
functions of the absorbents, and
force of the circulation in a rema
It is administered in fevers and i
to reduce the frequency of the
allay excessive vascular exciteme
(unless the habit is full and p
cordy), as a diuretic, either alon
with squills, calomel, salines, or
ternal hæmorrhages, as a sedat
pulse is full, hard, and throbbin
of the heart and great vessels, a
to reduce the force and velocity
lation; in epilepsy and insanity,
cular excitement; and in spas
scrofula, and several other dis
or other of the above intentions.

The greatest caution is requi
of foxglove, as its effects accu
system, and the unwary practi
sionally surprised at the sudd
his patient, even after he has l
of this drug.—*Dose.* ¼ gr. to 1½
every 6 hours. See Extra
Tincture, &c.

FOX'ING. See Malt Liquo

FRACT'URE. *Syn.* Fract
breaking or disruption of a

divided into two parts, it is
FRACTURE; when the integu-
lacerated, a COMPOUND FRAC-
en the bone is splintered, a
ACTURE.

NSE. *Syn.* COMMON FRANK-
(Ph. L.), L. The turpentine
om the bark of *Abies excelsa*
fir) and *Pinus palustris* (pitch
hardened by the air. (Ph. L.)
olibanum, which is the pro-
swellia thurifera, is the 'odor-
' of commerce.

nkincense. *Syn.* THUS PRÆ-
.), L. *Prep.* (Ph. L.) Frank-
water, q. s. to cover it; boil
s melted, and strain through a
n the whole has cooled, pour
nd keep the frankincense for
common resin in its general

Syn. FRAXIN; FRAXINA, L. A
neutral, and crystallizable
le in boiling water, extracted
Fraxinus excelsior, or common
fuge.

These are round or oval-
h spots, similar to stains, de-
skin. There are two varie-
, or SUMMER FRECKLES, re-
he action of the sun and heat
mer season, and disappearing
ather or exposure; and—COLD
ch occur at all times of the
ner are chiefly confined to per-
plexion, whilst the latter attack
complexions indifferently, and
me a lively yellow or greenish

Common freckles may gene-
red by the frequent application
ts, acids, or alkaline solutions;
st strong enough to prick the
freckles commonly occur from
alth, or some general disturb-
ystem, to which attention should
rected. In both varieties the
chloride of mercury (Ph. L.), or
tion, will be found a most useful
cation. See *below*.

otion for. *Prep.* 1. Bichloride
gr.; hydrochloric acid, 30 drops;
1 oz.; rectified spirit of wine,
water, 7 oz.; agitate together
le is dissolved.

r leaves of red roses, 1 oz.; hot
oz.; infuse an hour, and strain,
ion, ¼ pint; add of citric acid,
lve, and in a few hours decant

ves (dried), ½ oz.; lemon juice
sed) and rum or brandy, of
digest 24 hours, and squeeze out
use.

h) Sal ammoniac, 1 dr.; *spring*
lavender water or eau de Cologne, ¼ oz.; mix. The above are applied with the fingers night and morning, or oftener.

Freckles, Pomade for. *Prep.* 1. Citrine ointment, 1 dr.; simple ointment, 7 dr.; otto of roses, 3 drops.

2. Elder flower ointment, 1 oz.; sulphate of zinc (levigated), 20 gr.; mix by porphyrization, or by trituration in a wedgwood-ware mortar. Both the above, applied night and morning, are excellent for either cold or summer freckles.

FREEZ'ING MIXTURES. See ICE and REFRIGERATION.

FRENCH BER'RIES. *Syn.* PERSIAN BERRIES, AVIGNON B.; GRAINES D'AVIGNON, Fr. The unripe berries or fruit of the *Rhamnus infectorius*. They are imported from France and Persia; those from the latter country being esteemed the best. Some writers state that the Persian berries are the product of a distinct species, namely, *R. amydalinus*. They are chiefly used for dyeing morocco leather yellow. Their decoction dyes cloth, previously mordanted with alum, tartar, or protochloride of tin, of a yellow colour; with sulphate of copper, an olive; and with red sulphate of iron, an olive-green colour.

FRENCH POL'ISH. Several varnishes are used under this name. That most generally employed is a simple solution of pale shell-lac in either methylated spirit or wood naphtha. Sometimes a little mastic, sandarac, or elemi, or copal varnish, is added to render the polish tougher.

Prep. 1. From pale shell-lac, 5½ oz.; finest wood naphtha, 1 pint; dissolve.

2. Pale shell-lac, 3 lb.; wood naphtha, 1 gall. Methylated spirit (68 o. p.) may be substituted for the naphtha in each of the above formulæ.

3. Pale shell-lac, 5 oz.; gum sandarac, 1 oz.; spirit (68 o. p.), 1 pint.

4. Pale shell-lac, 5¼ oz.; gum elemi, ¾ oz.; spirit, 1 pint.

5. Pale shell-lac, 1½ lb.; mastic, ½ lb.; spirit, 2 quarts.

6. Pale shell-lac, 2¼ lb; mastic and sandarac, of each, 3 oz.; spirit, 1 gall.; dissolve, add copal varnish, 1 pint, and mix by roughly agitating the vessel. All the above are used in the manner described below.

7. Shell-lac, 12 oz.; wood naphtha, 1 quart; dissolve, and add of linseed oil, ¼ pint.

8. Shell-lac, ¼ lb.; gum sandarac, ¼ lb.; spirit, 1 quart; dissolve, add of copal varnish, ¼ pint; mix well, and further add of linseed oil, ¼ pint. The last two require no oil on the rubber.

Obs. The preparation of French polish is precisely similar to that of other spirit or naphthalic varnishes. Sometimes it is coloured, in order to modify the character of the wood. A REDDISH TINGE is given with dragon's blood, alkanet root, or red sanders wood; and a YELLOWISH TINGE, by turmeric root or *gamboge*. *When it is simply desired to* DARKEN *the wood,* brown shell-lac is employed to make the polish; and when the object is to keep the wood LIGHT COLOURED, a little oxalic acid (2 to 4 dr. to the pint) is commonly added. These substances are either steeped in or agitated with the polish, or with the solvent, before pouring it on the 'gums,' until they dissolve, or a sufficient effect is produced. French polish is not required to be so clear and limpid as other varnishes, and is, therefore, never artificially clarified. See VARNISH, and *below*.

FRENCH POL'ISHING. This process, now so generally employed for furniture and cabinet work, is performed as follows:—The surface to be operated on being finished off as smoothly as possible with glass paper, and placed opposite the light, the 'rubber' being made as directed below, and the polish (see above) being at hand, and preferably contained in a narrow-necked bottle, the workman moistens the middle of the flat face of the rubber with the polish, by laying the rubber on the mouth of the bottle and shaking up the varnish against it, once, by which means the rubber imbibes the proper quantity to cover a considerable extent of surface. He next encloses the rubber in a soft linen cloth, doubled, the rest of the cloth being gathered up at the back of the rubber to form a handle. The face of the linen is now moistened with a little raw linseed oil, applied with the finger to the middle of it, and the operation of polishing immediately commenced. For this purpose the workman passes his rubber quickly and lightly over the surface uniformly in one direction, until the varnish becomes dry, or nearly so, when he again charges his rubber as before, omitting the oil, and repeats the rubbing, until three coats are laid on. He now applies a little oil to the rubber, and two coats more are commonly given. As soon as the coating of varnish has acquired some thickness, he wets the inside of the linen cloth, before applying the varnish, with alcohol, or wood naphtha, and gives a quick, light, and uniform touch over the whole surface. The work is, lastly, carefully gone over with the linen cloth, moistened with a little oil and rectified spirit or naphtha, without varnish, and rubbed, as before, until dry.

The RUBBER for French polishing is made by rolling up a strip of thick woollen cloth (list) which has been torn off, so as to form a soft elastic edge. It should form a coil, from 1 to 3 inches in diameter, according to the size of the work.

FRES'CO-PAINTING. See PAINTING.

FRICANDEAU. [Fr.] Among *cooks*, a ragoût, or fricassée of veal. The same term is also sometimes applied to stewed beef, highly seasoned.

FRICASSEE. [Fr.] A dish prepared by stewing or semi-frying, highly flavoured with herbs, spices, or sauce. Small things, as chickens, lamb, &c., and cold meat, are usually formed into fricassees.

FRICTION. In a general se
rubbing one body against anothe

Friction. In *mechanics*, this
ance which the surface of a movi
with from the surface of the bod
moves. To lessen the amount
machines, various unctuous sub
tallow, soap, black-lead, &c., ar
gineers. These substances act
smoothness to the points of con
reduce their resistance to eac
full consideration of the subje
engineering.

Friction. In *medicine*, fric
simple or conjoined with linime
peutical agent of considerable
the circulation is promoted in de
and medicinal substances (iodi
opium, &c.) are made to penetra
the skin. "The benefit of fricti
sists of motion and heat, wheth
same be raised by rubbing th
coarse cloth or the flesh-brus
tages inconceivable and scarcel
which the obstructions of the p
neous glandules are opened, th
juices broken into small partic
and rendered fit to be carried o
tion, in the room of which, as n
lam well observes, new juice wil
new vigour to the body; and k
that great naturalist, is this w
tainly promoted" (Daniel Turne

Simple friction is performed
alone, or with a piece of flannel,
or a flesh-brush. "If it be
formed—namely, by short, brisk
the tips of the fingers, and with
when the naked hand is the ag
be continued for an hour or
repeated several times a day—i
reducing swelled glands and sw
joints, as well as in alleviating rh
is very great; but, besides bei
formed, the friction should be
(at least) half an honr, in orde
useful." (Dr. R. E. Griffith.)

Gentle, slow, and equable fri
ducing a continued repetition of
impression on the nervous syst
as an anodyne and hypnotic. Fo
"the operator should sit by th
bed, and, introducing the hand u
clothes, rub the legs or the a
parts) gently, with equally le
slow movements. When the inv
its influence is more powerful w
a monotonous, but a soft tune, wh
it operates upon a distinct sense,
bination, renders the friction mo
(Griffith.)

When the friction is accompa
use of any acrid or irritating su
intended to introduce any active
the system, the rubbing should
of sufficient force to slightly

icle; and should be continued
stance, which is usually in the
intment, either wholly or par-
urs, owing to its absorption by
e hand of the operator should,
be guarded by a glove; other-
ly to share with the patient the
medicine, a result not always
ven safe.

C MIXTURES. See Refrige-

pulverulent materials of glass,
they coalesce without melting.
Glass, &c.

. Fried batter. A species of
dning fruit, sweetmeats, poultry.

. Alexis Soyer.) "The following
pts in one:"—Soak crum of
cold water, q.s.; take the same
y kind of boiled or roasted meat
nd chop it into fine dice; press
of the bread; put into the pan
r dripping, 2 oz., with chopped
easpoonfuls; fry two minutes,
, stir with a wooden spoon until
hen add the meat, and season
easpoonful, pepper, ¼ do., and a
nutmeg, if handy; stir till quite
ther add two eggs, one at a time.
ckly, and pour it on a dish to
ll it into the shape of small eggs,
r, 'egg' them, and bread-crum
fry in abundance of fat to a nice
, and serve either plain, or with
other savoury sauce you fancy.
dishes can be made in this way;
everything that is eatable, and
of the year—from the remains
ltry, game, fish, vegetables, &c.
n be done with chopped, dried,
fruits, simply using a ¼ lb. more
ifting powdered sugar and cinna-
m. Cream may also be used for
ls.

re also (and more commonly) fried
batter, instead of bread-crums.
o end to what may be done with
pts." "They can be ornamented
worthy the table of the greatest
the bread be soaked in cream,
or liquor introduced into them."

Rundell:—*a.* (Apple fritters.)
fritters.

kwheat fritters, B. cakes, Bock-
ade by beating up buckwheat flour
r with some warm milk, adding a
, letting it rise before the fire for
minutes, then beating in some eggs
or warm water, as required, and
m like pancakes. Buckwheat frit-
well prepared, are excellent. Made
, and served up with molasses,
s a common dish in almost every
in *North America.*

c. (Curd fritters.) From dried curd, beaten with yolk of egg and a little flour, and flavoured with nutmeg.

d. (French fritters.) Common pancakes, beaten up with eggs, almonds, and flavouring sugar, orange-flower water, and nutmeg), and the paste dropped into a stew- or frying-pan half full of boiling lard, so as to form cakes the size of large nuts, which are cooked till brown.

e. (Fruit fritters.) From the sliced fruits, with rich batter.

f. (Soufflé fritters.) Rich pancakes, flavoured with lemon.

g. (Spanish fritters.) From slices of French rolls soaked in a mixture of cream, eggs, sugar, and spices, and fried brown.

FROG. The esculent variety, in Europe, is the common green or gibbous frog, the *Rana esculenta* of Linnæus. As an aliment, it is much esteemed on the Continent. Its liver is among the simples of the Ph. L. 1618, and was once considered a useful remedy in certain forms of ague.

FROST-BITES. When those parts of the body in which the circulation of the blood is most languid are exposed to extreme cold, they quickly become frozen, or, as it is called, 'frost bitten.' The fingers, toes, ears, nose, and chin, are most liable to this attack. The remedy is long-continued friction with the hands or cold flannel, avoiding the fire, or even a heated apartment.

FRUIT. *Syn.* Fructus, L. Among botanists, this is the mature ovary or pistil, containing the ripened ovules or seeds. In familiar language, the term is applied to any product of a plant containing the seed, more especially those that are eatable.

Fruits are extensively employed as articles of diet by man, both as luxuries and nutriment. The fruit of the cereals furnishes our daily bread; that of the vine gives us the well-known beverage, wine, whilst other varieties enrich our desserts, and provide us with some of our most valuable condiments and aromatics. The acidulous and subacid fruits are antiseptic, aperient, attenuant, diuretic, and refrigerant. They afford little nourishment, and are apt to promote diarrhœa and flatulency. They are, however, occasionally exhibited medicinally, in putrid affections, and are often useful in bilious and dyspeptic complaints. The farinaceous fruits (grain), as already stated, furnish the principal and most useful portion of the food of man. The oleo-farinaceous (nuts, &c.) are less wholesome and less easy of digestion than those purely farinaceous. The saccharine fruits, or those abounding in sugar, are nutritious and laxative, but are apt to ferment and disagree with delicate stomachs when eaten in excess. Stone fruits are more difficult of digestion than the other varieties, and are very apt to disorder the stomach and bowels.

As a rule, fruit should never be eaten in lastly, whitewashed. It is heavier than common steam coal, and is said to go fully 1-3rd further, by which facility of transport and economy is combined.

FUEL, PURIFIED BLOCK. This is prepared by the torrefaction of washed coal dust, and is said to possess in a remarkable degree the advantages of both coke and steam coal.

FU′LIGOKA′LI. *Prep.* (Dr. Polya.) Caustic potassa, 1 part; water, q. s.; dissolve; add of wood soot, 5 parts; boil 1 hour, dilute with water, filter, evaporate the filtrate to dryness, and put the product at once into warm, dry bottles.—*Dose.* 2 to 3 grs., thrice a day, made into pills, which must be coated with gum and kept from the air. (See *below.*)

Fuligokali, Sulphuretted. *Syn.* FULIGOKALI SULPHURETUM, L. *Prep.* (Dr. Polya.) Caustic potassa, 7 parts; sulphur, 2 parts; water, q. s.; dissolve with heat, add of fuligokali, 30 parts, evaporate to dryness, and preserve it in well-corked dry bottles.—*Dose, &c.* As the last.

Obs. M. Gibert states that he has tried both fuligokali and sulphuretted fuligokali on his patients at the Hospital Saint-Louis, both internally and externally, with manifest advantage in various obstinate chronic skin diseases. He made a pommade of 30 grammes (say 1 oz.) of lead ointment, and 1 or 2 grammes (say 20 to 25 grs.) of fuligokali, in which he recognised positive resolvent, detersive, and stimulant properties. See ANTHRACOKALI.

FULLER'S EARTH. *Syn.* CIMOLIA, C. TERRA, L. A soft, unctuous, friable, greenish or yellowish-gray species of clay, containing 53% of silica, 10% of alumina, and about 9% of oxide of iron. After being dug out of the earth, it is thoroughly dried in ovens, and

phial, where, after some
neously crumble down into

Obs. When the above
conducted, the resulting
tassium, and fulminates
with water. A piece the
duced into a mass of gun
on being thrown into wat
moistened in any other man

Fulminating Bis′muth.
muth, 120 parts; carburett
60 parts; nitre, 1 part.
sium.—*Prop., &c.,* resemble
We have been assured that
pound used by the late Capt
of his secret fusees.

Fulminating Cop′per.
OF COPPER. *Prep.* Digest
der or filings) with fulminat
silver, and a little water.
green crystals that explod
flame.

Fulminating Gold. *Prep.*
pitated peroxide of gold is
liquor of ammonia for 24
sulting product is dried in
a temperature below 180°
taken to avoid the slightes
should explode. A deep ol
der.

Obs. This compound ca
made in very small quanti
without great care it explo
violence. This is caused by
tion or sudden increase of he
ing property may be destr
in pearlash ley, or weak oil
heating the residuum after w

n as the effervescence is over,
s cease to be evolved, filter
paper, wash with cold water,
m (not hotter than 212°) or
e fulminate is then to be
gr. paper parcels, and these
box or corked bottle.—*Pro-*
the weight of mercury em-

mall brownish-gray crystals,
the sun; entirely soluble in
ling water, and deposited as
s under the form of beautiful
It greatly resembles fulmi-
n its appearance and general
xplodes violently by both fric-
ion, but unlike the the silver-
ns with a sudden and almost
hen kindled in the open air.
cond formula is not only the
e best and safest. The first is
and dangerous. There is no
pouring the alcohol into the
for at each effusion an ex-
kes place; whereas, by pouring
o the alcohol, no danger what-
L This preparation is used for
pper percussion caps for fowl-
kets, &c. Dr. Ure, in his first
oard of Ordnance, recommended
irituous solution of gum sanda-
substance for diluting the ful-
ing it in the caps; but in a sub-
t to the same Board, he stated
of mastic in spirit was to be
t the present time the following
s applied to the interior of per-
n quantities varying from ·2 to
—Chlorate of potassium, 26 parts;
lminate of mercury, 12; sulphur,
glass, 14; gum, 1, making alto-
arts. (Watts.)
Fulminate of mercury should only
mall parcels at a time, and these
aced at a distance from each other.
l explosion which occurred some
Apothecaries' Hall, and by which
, the talented chemist of the Apo-
ompany, lost his life, was occa-
the spontaneous detonation of this

ting Plat'inum. *Syn.* PLATINUM
, L. *Prep.* By acting on binoxide
a with pure ammonia. It is analo-
e gold and silver ammonio-com-

ting Powder. *Syn.* DETONATING
PULVIS FULMINANS, L. *Prep.* 1.
arts; carbonate of potash (dry), 2
s of sulphur, 1 part; reduce them
to fine powder, before mixing them.
f this compound (20 to 30 grs.),
d on a shovel over the fire, first
becomes brown, and then explodes
ing report.
s, 1 part; chlorate of potassa, 3 parts. When triturated, with strong pressure, in a marble or wedgwood-ware mortar, it produces a series of loud reports. It also fulminates by percussion.

3. Chlorate of potassa, 6 parts; pure lampblack, 4 parts; sulphur, 1 part. A little placed on an anvil detonates with a loud report, when struck with a hammer. No. 1 is the substance commonly known as 'FULMINATING POWDER.' See BLASTING POWDER.

Fulminating Sil'ver. *Syn.* ARGENTUM FULMINANS, L. Two very distinct compounds are known by this name, the one containing oxide of silver and ammonia, and the other being a true fulminate of silver.

Prep. 1. (AMMONIA-COMPOUND OF SILVER, BERTHOLLET'S FULMINATING SILVER.)—*a.* Digest oxide of silver (recently precipitated and dried by pressure between bibulous paper) in concentrated liquor of ammonia, for 12 or 15 hours, pour off the liquid, and cautiously dry the black powder in the air, in divided portions. The decanted ammoniacal liquor, when gently heated, yields, on cooling, small crystals, which possess a still more formidable power of detonation than the black powder, and will scarcely bear touching, even whilst under the liquid.

b. Dissolve chloride of silver in strong liquor of ammonia, cautiously add pure potassa (in fragments), and when effervescence ceases, decant the fluid portion, and wash and dry the powder, as before.

2. (FULMINATE OF SILVER, BRUGNATELLI'S FULMINATING SILVER; ARGENTI FULMINAS, L.)—*a.* Pour alcohol, 1 oz., on nitrate of silver (in fine powder), 100 grs., previously placed in a capacious flask or beaker glass, and shortly afterwards add strong nitric acid, 1 oz.; as soon as all the powdered nitrate assumes the form of white clouds, add cold distilled water, q. s. to suspend the ebullition, and next collect the powder on a filter, and otherwise proceed as with the ammonia-compound (*above*).

b. (Fownes.) Metallic silver, 40 to 50 grs.; nitric acid (sp. gr. 1·37), $\frac{3}{4}$ fl. oz.; dissolve by the aid of a gentle heat, add, whilst the solution is still hot, alcohol, 2 fl. oz., and again apply heat until reaction commences; the fulminate slowly separates from the hot liquid under the form of small, brilliant, white, crystalline plates, which, after being slightly washed with a little cold distilled water, are to be distributed upon separate pieces of filtering paper, in portions not exceeding 1 or 2 grs. each, and left to dry in the air. When dry, the papers are to be folded up, and carefully preserved in a box or bottle. A sixpence and the strongest commercial nitric acid and rectified spirit answer for the above purpose.

c. (Liebig.) Grain silver, 1 part; nitric acid (sp. gr. 1·36 to 1·38), 10 parts; dissolve at a *gentle heat, and* add the solution to alcohol of *85%, 23 parts;* apply a gentle heat till the *liquid begins to* boil, then remove it from fire and set it aside to cool; the fulminate of silver is deposited in lustrous, snow-white, acicular crystals, and when washed and dried, equals in weight that of the silver employed.

Prop., *&c.* The properties of both compounds are very similar. Those of the true FULMINATE OF SILVER (No. 2) need only be considered here. This dissolves in 36 parts of boiling water, but the solution deposits the greater portion of the fulminate as it cools. It is one of the most dangerous substances for which we are indebted to modern chemistry. It explodes with unparalleled violence by friction or percussion, or when strongly heated, or when touched with strong sulphuric acid; the metal is reduced, and a large volume of gaseous matter suddenly liberated. Strange to say, though its explosive tendency is so great that it can be hardly made, handled or kept, with safety, it may, when very cautiously mixed with oxide of copper, be burned in a tube to determine its composition, in a similar manner to that employed in the analysis of other organic substances. Many frightful accidents have happened from the spontaneous explosion of this substance. 1 or 2 grs. are the most that can be exploded with safety in a building or confined space.

Fulminating Zinc. *Syn.* FULMINATE OF ZINC; ZINCUM FULMINANS, ZINCI FULMINAS, L. *Prep.* From fulminate of silver, zinc filings, and a little water, digested together, as FULMINATING COPPER.

FULMINA'TION. *Syn.* FULMINATIO, L. Detonation. A sudden explosion, accompanied with a loud report and extreme violence. Some chemists, without sufficient reason, have endeavoured to confine the application of the term to the explosion of a fulminate.

FUMIGA'TION. *Syn.* FUMIGATIO, SUFFUMIGATIO, L. Fumigations (FUMIGATIONES) are vapours of gases extemporaneously extricated for the purpose of destroying contagious or noxious miasmata or effluvia, or to mask unpleasant odours, or to produce a medicinal action on those parts of the body with which they are brought in contact.

Fumigations, for the purpose of obviating or masking unpleasant odours in the sick chamber, must never be employed to the neglect of cleanliness and ventilation; for most of them, instead of purifying the air, actually render it less fit for respiration. The common practice of burning scented paper, pastilles, sugar, juniper berries, benzoin, cascarilla, &c., so as to create an odoriferous smoke, is of this character. As disinfecting agents, they are probably useless; and are relics of an ancient custom of burning frankincense and other odorous substances in vitiated air, to overcome the fetor ·hich is more or less present. The fumes thus ·sed through the atmosphere "disguise ·nt odours; but they accomplish no- ·. The infection remains not only ·he diffusion of the most powerful

aromatic vapours, but its delete are sometimes augmented by th

Among the various substanc INFECTING FUMIGATIONS, chlo general consent, holds the fi Carmichael Smyth recommend which is even now preferred by to chlorine; whilst Prof. Grah fumes of burning sulphur as than either of these substances of hydrochloric acid and of vi smoke of gunpowder, which advocates, have now justly favour.

Of all common diseases, scarl to be the one most requiring fu this purpose, chlorine gas or employed. The infectious mat diseases, especially scarlet fe dissipated or destroyed at a hea that of boiling water. (Dr. tagious diseases are very comm in this metropolis by persons linen washed by laundresses their operations in the same si misery in which they live. S *pharmacy*), DISINFECTANT, IN and *below*.

Ace'tic Fumigation. *Syn.* F TICA, L. The fumes of strong vi acid, obtained by heating the lamp, or by sprinkling it on Aromatic vinegar in this way freshing fumes, and was formerl efficacious than simple acetic aci

An'odyne Fumigation. *Syn* ANODYNA, L. *Prep.* (Trousse Stramonium and sage, equal p to fill a small pipe. Smoked asthma, irritating coughs, &c.

Aromat'ic Fumigation. See MIGATION.

Balsam'ic Fumigation. *Syn.* MIGATION; FUMIGATIO AROMA SAMICA, L. *Prep.* 1. From either alone or mixed with oliba thrown on hot cinders or a heate

2. (Dr. Dohrn.) Gum oliba gum benzoin, styrax, and flower lavender, of each, 1 part; to powder, and used as before.

3. Amber, mastic, and oliba 3 oz.; benzoin and styrax, of camphor, 1 dr. As last. The in hooping-cough, asthma, &c.; tity only being employed at a ti

Belladon'na Fumigation. *Sy* BELLADONNÆ, L. *Prep.* (M From dried belladonna leaves, 1 before. In spitting of blood, ling cough, &c.

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[1] We deem it right to remark that a respecting the disinfecting power of od now held by many scientific men. A opinion, the minute particles of aroma really destroy or render inert the mi

gation. *Syn.* DISINFECTING
YTON-MORVEAU'S F.; FUMI-
x, L. *Prep.* 1. (P. Cod.)
parts; water and sulphuric
parts; black oxide of manga-
x in a shallow vessel, placed
the apartment. This is *used*
cupied rooms.

lime, either sprinkled on the
eted) or (if carpeted) placed
in shallow dishes. An old
-pot saucer answers for this
for inhabited rooms, and on

of chloride of lime (1 oz. of
ach quart of water). *Used* as
re freely.

fumigations, although so po-
ich relied on by many medical
e apparently useless in pre-
ogress of certain contagious
Moscow, chlorine was exten-
found unavailing, nay even in-
ra." (Dr. Pereira.) "At the
holera hospital was filled with
ne, then it was that the greatest
e attendants were attacked."
At the Smallpox Hospital,
was tried, with the view of ar-
gress of erysipelas, "all offen-
s removed, but the power of
; the disease remained behind."
Gaz.') Notwithstanding these
s, the confidence of many emi-
of the profession continues un-
a fumigation agent, disinfectant
, chlorine, I believe, stands un-
or destroying miasmata, noxious
itrid odours, it is the most pow-
nown." (Dr. Pereira.) Our
e leads us to the conclusion that
ore useful in neutralising the
morbific matter of fevers (espe-
et fever) and putrid diseases ge-
of the other diseases in which it
loyed.

'ric Fumigation. *Syn.* MURIATIC
; FUMIGATIO MURIATICA, F.
CHLORICI, L. *Prep.* From com-
ed in a cup or saucer, and an
of sulphuric acid poured over it.
used. It rapidly neutralises am-
es.

nigation. *Syn.* FUMIGATIO IO-
Prep. 1. From iodine, 5 to 25 grs.,
rding to extent of surface, placed
iron contained in a box or case
limb is enclosed. In the usual
in which the use of iodine is

und; FUMIGATIO IODINII COM-
m.) Iodine, 20 grs.; red sulphide
0 grs.; sulphur, 6 drs.; mix, and
2 powders. One to be used, as
times daily; *in lepra, psoriasis,*

Mercu''rial Fumigation. *Syn.* FUMIGATIO MERCURIALIS, L. *Prep.* (Bouchardat.) Olibanum (in powder), 2 parts; red sulphide of mercury, 3 parts. A little is sprinkled on red-hot coals or a heated shovel held beneath the part; or the fumes are inhaled. *Obs.* Abernethy used the black oxide of mercury (1½ to 2 drs.), and applied it to the whole body, excepting the head, in a similar way to the sulphur bath, and continued the application for about a quarter of an hour. See CANDLES (Mercurial), and No. 2, (*above*).

Mu'riatic Fumigation. See HYDROCHLORIC F. (*above*).

Ni'trous Fumigation. *Syn.* FUMIGATIO NITROSA. *Prep.* (P. Cod.) Sulphuric acid, diluted with half its weight of water, is placed in a porcelain cup (any shallow vessel of glass or earthenware will do), placed over heated cinders, and small quantities of powdered nitre added to it from time to time.

Obs. Heat causes the gas to be evolved more rapidly, and thus renders the fumes more offensive, without increasing their efficacy. Equal weights of oil of vitriol and water are the proportions usually employed. ½ oz. of nitre is said to be sufficient for a small room. (Dr. Bateman.) The vessel containing the ingredients should be placed in an elevated position in the centre of the apartment.

Dr. Carmichael Smyth, who introduced nitrous acid gas as a fumigation (1799), received a reward of £5000 from Parliament for publishing his formula.

Sulphu'rous Fumigation. *Syn.* FUMIGATIO SULPHUROSA, F. SULPHURIS, L. *Prep.* 1. The gas produced by burning sulphur (sulphurous anhydride—SO_2).

2. Flowers of sulphur, 7 parts; nitre, 4 parts; benzoin and olibanum, of each, 2 parts; camphor, 1 part; pressed into the bowls of tobacco-pipes, and lighted with a quick-match. See BATH and DISINFECTANT.

Tar Fumigation. *Syn.* FUMIGATIO PICEA, SUFFUMIGATIO PICIS LIQUIDÆ, L. *Prep.* 1. Vegetable tar, 1 part; water, 7 or 8 parts; mix, and let it simmer in an open vessel set over a spirit lamp placed near the centre of the apartment.

2. (Sir A. Crichton.) Norway tar, 1 lb.; powdered carbonate of potash, ½ oz. or 1 oz.; mix, and heat it as last. The potash is added to neutralise any volatile acid. Formerly highly thought of in bronchitis and pulmonary consumption.

Tooth'ache Fumigation. *Syn.* FUMIGATIO ODONTALGICA, F. ANTI-NEURALGICA, L. *Prep.* 1. From henbane seeds, powdered and thrown into a basin of boiling water, and the affected part held in the steam. Sometimes a little of the seed is placed in a heated iron spoon, and the part exposed to the fumes.

2. (Beasley.) A popular remedy is to throw *henbane seed on hot cinders*, inverting a cup *over them to receive* the smoke and empyreu-

matic oil produced. The cup is then filled with hot water, and the steam conveyed to the affected side of the mouth.

FU"MING LIQUORS. See AMMONIUM SULPHYDRATE, ARSENIC TRICHLORIDE, TIN BICHLORIDE, &c.

FUNG'I. In *botany*, a natural order of cellular plants, producing their fructification in the air; growing in or upon decaying or living organic substances, and nourished through their vegetative structure called the spawn or mycelium. Fungi have very variable properties. Some are medical, others edible, others are deadly poisons. The various diseases of plants known as blight, mildew, rust, smut, vine-mildew, potato-disease, ergot, &c., are either caused by or accelerated by the agency of fungi. See AGARIC, MUSHROOM, &c.

FUR'NACE. An enclosed fireplace for obtaining a high degree of heat. Furnaces vary much in construction and size, according to the particular manufacture in which they are employed. They may be broadly divided into two classes—WIND-FURNACES and BLAST-FURNACES. In the former a high temperature is produced without the aid of bellows by means of a powerful draught. In the latter heated air is blown in through a pipe or pipes at the bottom. For many metallurgic and large chemical operations REVERBERATORY FURNACES are employed. A furnace of this kind is usually long, with a low roof to keep down the flame and hot air upon the 'hearth' or space between the fireplace and the flue.[1] For the smaller operations in chemistry, a variety of furnaces have been invented, and the introduction of coal gas as a fuel by Deville, Griffin, Gore, and others, has wrought a complete change in the arrangements of the laboratory. The GAS-FURNACES of Mr. J. J. Griffin are adapted for almost every operation performed by the aid of heat. Those more recently introduced by Mr. W. Gore are very compact and portable, and will rapidly produce a 'white heat,' without the help of bellows or high chimney, by means of ordinary coal gas and atmospheric air. The first and smallest size consumes 33 cubic feet of gas (value seven farthings) per hour, and is suitable for assayers, jewellers, analytical chemists, experimentalists, dentists, and others. It is capable of fusing eight ounces of copper or six ounces of cast iron; copper begins to melt in it in about twelve minutes from the time of lighting. The second-sized one consumes about twice that quantity of gas, is suitable for manufacturing jewellers generally, and for a great variety of practical persons who require to melt small quantities of gold, silver, copper, german silver, brass, cast iron, glass, and other substances, or require a small crucible heated to high temperatures. It is capable of melting 45 ounces of copper, or 40 ounces of cast iron, and with its heat up it melts one pound of copper in eight minutes; coppe
melt in about twenty minutes fr
of lighting. See ASSAYING, CH
PER, CRUCIBLE, FUEL, &c.

FUR'NISHING. It is essential
of neatness, and for a pleasing
eye, that there should be a harmo
and also a similarity of style, in t
cles of furniture. The tints of
of the paper or paint of the wall
window-curtains, should be all i
each room; that is, either pos
resemblance of colour, or vario
pleasing contrast and harmony w
If the preponderating colour of t
scarlet, and the colour of the w
blue, a most inharmonious and un
is produced; but brown and g
and gold, will be in harmony, an
fore, be placed together. Carpe
most expensive articles, it is safes
first, and then to let their colour
the tone and style of the cur
hangings, chair-covers, hearth-
various minor articles. It is al
to buy carpets of the same patter
rooms, because in the event of
house with different sized apart
of one carpet may be taken to alt
another.

FUR'NITURE. See FRENCH
OIL, POLISH, VARNISH, &c.

FURS. Of these the most
Ermine and Sable. Fur skins,
pared, or merely dried, go under
'Peltry.' (Brande.)

Furs may be preserved from mo
insects by placing a little colocynt
apple), or spice (cloves, pimento, &
in muslin, among them; or they m
in a very weak solution of corros
in warm water (10 or 15 grs. to t
afterwards carefully dried. As
other species of clothing, they sh
in a clean, dry place.

FU'SEL-OIL. *Syn.* FOUSEL O
OIL, OIL OF POTATO SPIRIT, GRAI
SPIRIT OIL, MARC-BRANDY OIL,
DRATED OXYDE OF AMYL. *Sour*
sive, strong-smelling oil, produce
alcohol during the fermentation o
toes, &c., on the large scale, and
the peculiar and disagreeable flavo
to raw whiskey. It is found chie
portion of the spirit which passes
the 'faints,' to which it impart
teristic odour and flavour. By re
faints at a very gentle heat, most
and water first pass over together
little fusel oil, whilst the latter fo
duum in the still. Various name
are given to the crude oil th
according to its source. In each
tially consists of hydrated oxide
trifling and variable quantities of o
compounds are mixed with it,

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[1] For an illustration of this kind of furnace, see SODIUM, Carbonate of.

ter, more particularly its odour
he oil of potato spirit is the
rude fusel oil.

ertions of the distiller are di-
as possible, to lessen the forma-
during the fermentation of his
eliminate, during the distilla-
tion of his liquors, the greatest
ion of that with which they
ated.

sel oil is a nearly colourless
ith a rather high boiling-point,
ating, offensive smell, and an
iste; when swallowed, it occa-
iddiness, headache, &c.; in
uantities, vomiting, delirium,
ation, and lessened sensibility
our also produces these effects.
a narcotic poison. The greater
er of whiskey, more especially
rain, than other spirit, is due
uantity of fusel oil which it
appears to be well known to
of whiskey drinkers in these
the consumers of corn brandy
orthern parts of Europe. The
to frequently demand to be
glass of good fusel." In Eng-
chiefly used for lamps and var-

AMYLIC ALCOHOL (ALCOHOL
the Dublin College is thus pre-
uce the ordinary fusel oil of the
a small still or retort, connected
er, and apply heat; as soon as
o flow over, unmixed with water,
ould be changed, aud the distil-
, and carried nearly to dryness;
n the second receiver, and the
ich separates from the water in
ver, are to be reserved for use.
d in the preparation of VALE-
ODA. See AMYL, HYDRATE.

ALLOY'. *Syn.* FUSIBLE METAL.
muth, 2 parts; lead, 5 parts; tin,
ts in boiling water.

's.) Bismuth, 8 parts; lead, 5
parts. Melts below 212° Fahr.

.) Bismuth 8, tin 4, lead 5
ony, 1 part. The metals should be
lted and poured into drops, until
mixed.

) Lead, 3 parts; tin, 2 parts;
rts. Melts at 197° Fahr.

last, after removing it from the
uicksilver (warm), 1 part. Liquid
at 140° Fahr.

first four of the above are used to
OONS, to surprise children by their
t liquors. A little mercury may
wer their melting-points. Nos. 2
ecially adapted for making ELEC-
YPES. The beautiful casts of the
s known to all electrotypers as
s are *in the alloy No. 3. The*
re also used to form PENCILS *for* writing on asses' skin, or paper prepared by rubbing burnt hartshorn into it, &c.; also as a METAL BATH in the laboratory. The last is used for ANATOMICAL INJECTIONS.

FU'SION. *Syn.* FUSIO, L. The liquefaction of solid bodies by the action of heat. The term AQUEOUS FUSION has been applied to the melting of salts in their combined water when heated; and the term IGNEOUS FUSION, to the liquefaction of bodies by heat alone.

The vessels in which substances are fused are formed of various materials and shapes, according to the properties of the solid operated on, and principally with reference to the degree of heat required for its fusion. In every case the containing vessel should be capable of sustaining the proper degree of heat, without either melting or cracking, and should also be unacted on by the substances melted in them. See CRUCIBLE, FURNACE, &c.

FUS'TIC. *Syn.* FUSTIC WOOD. Two distict dye-stuffs are known by this name, but are distinguished by the adjectives 'old' and 'young.'

Old Fustic. *Syn.* BOIS JAUNE, Fr. The wood of the *Maclura tinctoria.* Its decoction dyes woollens yellow of different shades, according to the 'mordant.' Alum, tartar, and spirits of tin brighten the tint; acetate and sulphate of iron and common salt darken it; with sulphate of iron it gives olives and browns; with the indigo vat and sulphate of indigo green. These colours are very permanent. Its yellow turns on the lemon when pale, and on the orange when darker. 1 lb. of old fustic will dye 3 to 5 lbs. of wool.

Young Fustic. *Syn.* YELLOW FUSTIC; FUSTET, Fr. The wood of the *Rhus Cotinus* or Venice sumach. It gives a yellow turning on the green, but its colours are not very permanent. It is chiefly used in combination with other dye-stuffs.

GAL'BANUM. *Syn.* GUM GALBANUM; GALBANUM (B. P.), L. "A gum-resin derived from an unascertained umbelliferous plant. In irregular tears about the size of a pea, usually agglutinated into masses; of a greenish-yellow colour, translucent, having a strong disagreeable odour, and an acrid bitter taste." (B. P.) Its properties are similar to the other fetid antispasmodic gum-resins. It ranks between ASSAFŒTIDA and AMMONIACUM.

Strained Galbanum. *Syn.* PREPARED GALBANUM; GALBANUM COLATUM, G. PRÆPARATUM (Ph. L.), L. From crude galbanum, as PREPARED AMMONIACUM. Formerly the common practice was to melt it in the dry state, by heat cautiously and quickly applied, and to strain it through a piece of coarse canvas stretched across a wooden frame or 'horse.' The 'strained galbanum' of the shops is seldom pure. The following forms are current in *the trade for its* 'reduction,' as this species of *adulteration* is technically termed:

1. Galbanum (true), 9 lbs.; strain as above, then add, towards the end, black resin (clean), 3 lbs.; and when the whole is melted, further add of Venice turpentine, 2 lbs.—*Product.* 12 lbs.

2. Strained galbanum and black resin, of each, 6 lbs.; melt, and add, of strained assafœtida, 2 oz.; Venice turpentine, 3 lbs.—*Prod.* 14½ lbs.

Facti''tious Strained Galbanum. *Syn.* GALBANUM COLATUM FACTITIUM, L. *Prep.* 1. From black resin, 4 lbs.; melt, and add of Venice turpentine, 2 lbs.; assafœtida, 2½ oz.; oils of juniper and fennel, of each, 1½ dr.; water, ½ pint.

2. As the last, adding soft soap, 5 oz. Sometimes the small and 'waste' of the chests are added to the above to improve them.

GALL. *Syn.* BILE; BILIS, CHOLE, FEL, L. A bitter fluid secreted by the liver; in part flowing into the intestines, and in part regurgitating into the gall-bladder. Its uses in the animal economy appears to be—to separate the chyle from the chyme, to promote digestion of oleaginous substances, and to assist in exciting the peristaltic action of the intestines. The fæces appear to owe their colour chiefly to the presence of bile, since, without, they appear of a dirty pipe-clay colour.

The gall of various animals was formerly used in medicine. From whatever source it was obtained, it was believed to be calefacient, desiccant, detergent, discutient, and parturifacient; but besides these properties, each variety was conceived to possess virtues peculiarly its own. Thus, bear-gall (fel ursi) was reputed anti-epileptic; eel-gall (fel anguillarum) parturifacient; hare-gall (fel leporis), "good in cataract;" and ox-gall (fel bovis), "sovereign against stiff joints, rheumatics, angry ulcers, and stomach colics." The gall of the bat, goat, hen, hog, partridge, siluris, &c., were also employed as remedies. At the present time ox-gall is the only one used in medicine and the arts.

Ox-gall has been recently reintroduced into medicine by Dr. Alluatt and others, and in certain cases of dyspepsia and biliary derangement appears to be a valuable remedy.

Crude ox-gall is extensively employed by the scourers of woollen cloth, clothes renovators, &c. It rapidly extracts grease and oil from textile fabrics, without injuring the colour. See CONSTIPATION, DYSPEPSIA, OX-GALL, &c.

Gall, Glass. See SANDIVER.

GAL'LATE. *Syn.* GALLAS, L. A salt of gallic acid. The alkaline gallates are soluble. They rapidly suffer decomposition in the presence of excess of the base, and the liquor gradually acquires a blackish colour. The gallates of most of the other metallic oxides are insoluble.

GAL'LIC ACID. $H_3C_7H_3O_5 \cdot Aq$. *Syn.* ACIDUM GALLICUM (B. P.), L. "*A crystalline acid prepared from galls.*" (B. P. L.) It may
be also obtained from other
stances. It appears to be a
oxidation of tannic acid, and
exist ready formed in recent

Prep. 1. (Dumas.) Nut-
powder, are moistened with wa
to the action of the air, in a
(say 70° to 80° Fahr.), for two
adding more water, from time
up for that lost by evaporatio
of the above period the mould
mass is strongly pressed in a
solid portion boiled in a consid
of water. The solution (filte
deposits, on cooling, crystals
which, after being thorough
pressed dry between bibulous
fied by boiling them along
of their weight of prepared
coal, in 8 parts of water, and
before.

2. (Graham.) A strong inf
tion of galls is precipitated
acid, in the cold; the resulting
mixed with dilute sulphuric
the liquid expressed; the 'marc
with sulphuric acid, diluted
weight of water, and after boili
for some minutes, the whole
cool; the resulting crystals
before.

3. (Liebig.) A strong aque
tannic acid (tannin) is added to
as long as a precipitate falls;
collected, washed, and dissolve
heat in dilute sulphuric acid;
after being boiled for a few mi
on cooling, crystals of gallic ac
able quantity.

4. (Scheele.) A filtered dec
is exposed for some months in a
after a time it grows mouldy,
covered with a thick, glutino
two or three months the sides
and the under portion of the pel
to be covered with small yello
gallic acid, which are purified as
(See No. 1.)

5. (Ph. D., B. P.) The Dubli
two formulæ for gallic acid, the o
on that of Dumas or Scheele, th
of Graham or Liebig.—*a.* F
coarse powder), 1 lb.; water, q.
stiff paste; a porcelain dish is
the exposure in the moistened
be continued for 6 weeks; the
first crop of crystals is to be ma
of boiling water, and when th
cooled to 80° Fahr., it is to be po
the crystals which have forme
then to be washed with ice-co
oz., and dried—first in blottin
finally by a steam or water heat
the undissolved portion of the
fl. oz. of fresh water, more cry
obtained.

nuts, 1 lb., are steeped for
1 pint, and after being
a displacement apparatus,
ter, 1½ pint, added in suc-
l of vitriol, 5 fl. oz., diluted
ne of water, and allowed to
to the percolated infusion,
admixture, the liquid is
viscid precipitate which
, 5 fl. oz. (diluted as before),
e filtrate; the precipitates,
are submitted to powerful
quently dissolved in oil of
previously diluted with
e solution is boiled for 20
ide for a week; at the end
deposit which forms is dis-
mes its weight of boiling
tion treated as before.

cid forms small, feathery,
ess crystals, which have a
stre; that of commerce is
llow colour; it is soluble in
ater, and in 3 parts of boil-
lso soluble in alcohol, and
er; the aqueous solution is
posure to the air; dissolved
, it forms a deep, rich, red
hen thrown into water, drops
rived of some of its water.
soluble in the alkalies, and
madder. When strongly
id is converted into meta-
to pyrogallic acid, accord-
er in which the heat is

acid is distinguished from
not affecting solutions of
salts of iron, or the salts of
l by giving a deep bluish-
with the sesquisalts of iron,
when the liquid is heated.
d from pyrogallic acid by
ity in water, and by its not
ions of the protosalts of iron.
cid mixed with tannic acid,
be removed, either by di-
tance in ether, or by im-
time in its solution a piece of
lime, previously to applying

m colour; decomposed by
ater and in rectified spirit.
tions of the sesquioxide of
n water, of a bluish-black
s down nothing from a solu-

principal use of pure gallic
of *photography*. It has re-
loyed in *medicine*, as an in-
, in doses of 3 to 10 grs.,
ftener; in hæmorrhage and
for checking the night sweats
Todd says, that in all cases
hage, or *hæmorrhagic ten-*
st astringent or styptic we possess. As an external astringent, it is greatly inferior to tannic acid. It has been given in doses of 15 to 30 grs. in tape-worm, "but without any benefit." (Pereira.)

Purification. Gallic acid, as obtained by either of the above forms, is never quite pure; but it may be rendered absolutely pure by combining it with oxide of lead, and decomposing the compound (gallate of lead) by sulphuretted hydrogen. The sulphuret of lead acts like animal charcoal in removing the colour. (Liebig.) Commercial gallic acid "may be rendered nearly white by dissolving it in 20 times its weight of boiling distilled water, and causing the solution to traverse a stratum of prepared animal charcoal, spread upon a calico filter. When the liquid passes through colourless, it should be evaporated to 1-6th its volume, and then suffered to cool, in order to the separation of the crystallised acid." (Ph. D.)

GALLIC FERMENTATION. This name has been given to the peculiar process by which tannic acid is converted into gallic acid, under the joint influence of moisture and atmospheric oxygen. According to the researches of M. Antoine Larocque, the peculiar ferment of nut-galls which operates this change also converts sugar into alcohol and carbonic acid, in the same way as yeast does; whilst beer yeast, muscular flesh, and caseous matter, change tannin into gallic acid. The similarity of the gallic and vinous fermentation may hence be reasonably inferred.

GALLS. *Syn.* GALL-NUTS, NUT-GALLS; GALLA (B. P.); GALLÆ (Ph. E.). "Excrescences on *Quercus infectoria* caused by the puncture and deposited ova of *Diplolepis Gallæ tinctoriæ*." The best galls are bluish-black, heavy, and not yet perforated; intensely astringent. They are imported from Aleppo, and are known in commerce as black or blue galls (GALLÆ NIGRÆ, G. CŒRULÆ). The next quality is termed, from their colour, green galls (GALLÆ VIRIDES). Both are gathered before the insect has escaped, and are styptic and powerfully astringent. White galls (GALLÆ ALBÆ) are lighter, less astringent, and inferior.

Uses, &c. Galls are extensively employed in the art of dyeing, and constitute one of the principal ingredients in all the shades of black, and are also employed to fix or improve several other colours. A decoction of galls, to which a little green copperas and gum arabic has been added, forms common writing ink. In *medicine*, they are used as an astringent, in hæmorrhages and fluxes, in doses of 10 to 20 grs.; and topically, under the form of infusion or decoction, as a gargle in relaxation of the uvula; as an injection in gleet and leucorrhœa; as a lotion or fomentation in flabby ulcers, prolapsus ani, &c.; and as an ointment in piles, watery ulcers, &c. The infusion or decoction is also used as an antidote to poisoning by the alkaloids, and was formerly given as a tonic in intermittents. See GALLIC ACID, INK, &c.

GALL'STONE. *Syn.* CALCULUS BILIOSUS, C. CYSTICUS BOVINUS, L. Formed in the gall-bladder of neat cattle in winter, when they are fed upon dry food. *Used* as a yellow pigment, and in medicine.—*Dose.* 1 gr.; in dyspepsia and flatulency. See CALCULUS.

GAL'VANIZED IRON. See IRON and ZINCING.

GAM'BOGE. *Syn.* (CAMBOGE; CAMBOGIA, L. B. P.) GAMBOGIA, L. "A gum-resin obtained from *Garcinia Morella.*" (B. P.) Gamboge is an active hydragogue and drastic purgative, which occasionally proves useful in torpor of the abdominal and pelvic viscera; but which is highly dangerous in an irritable or inflammatory state of the stomach or bowels, and during pregnancy. It is very apt to induce nausea and vomiting. In large quantities it is a violent poison. "The deaths which have occurred from the use of enormous quantities of Morrison's pills, are mainly ascribable to the gamboge contained in those medicines." (Pereira.)—*Dose.* 1 to 5 grs., made into pills or mixture, every 4 to 6 hours; in obstinate constipation, in dropsies, in apoplexy and like cerebral affections, and in worms (especially tape-worm), either alone or combined with other cathartics. See COMPOUND EXTRACT OF COLOCYNTH.

GAN"GRENE. See MORTIFICATION.

GAN'TEINE. A composition used to clean kid and other leather gloves.

Prep. 1. (M. Buhan.) Curd soap (in small shavings), 1 part; water, 3 parts; mix with heat, and stir in of essence of citron, 1 part.

2. (SAPONINE,—Duvignau.) Soap (in powder), 250 parts; water, 155 parts; dissolve with heat, cool, and add, of *eau de javelle,* 165 parts, solution of ammonia, 10 parts, and rub the whole to a smooth paste. Patent. A small portion of either of the above is rubbed over the glove with a piece of flannel (always in one direction), until it is sufficiently clean. See GLOVES.

GARAN'CINE. See MADDER RED.

GAR'DENING. See HORTICULTURE.

GAR'GLE. *Syn.* GARGARISM, THROAT-WASH; GARGARISMA, GARGARISMUS, GARGARISMUM, L. A liquid medicine applied to the back part of the mouth or upper part of the throat. Gargles are applied by allowing a small mouthful to run as much as possible over the affected part, by holding the head backwards, and breathing through it, by which means the liquid is agitated and its action promoted.

Gargles are not to be swallowed. It often happens, however, that patients, either by accident or from negligence, do swallow a certain quantity, notwithstanding the instructions given them to the contrary. Care should therefore be taken to avoid making gargles of such substances as may occasion unpleasant symptoms in small doses, though th
perhaps, amount to poisoning.

Gargles usually have for their
simple water, or milk, wine, or vin
with water, to which, in both c
honey, or syrup, is generally ad
other ingredients vary with the
but must, in all cases, be either i
form, or soluble in the liquid
excipient.

Gargles are commonly dispensed
bottles. The quantity used at a
ordinary circumstances, may be a
of a wine-glassful.

Gargle. *Syn.* GARGARISMA, G.
G. SIMPLEX, L. *Prep.* 1. (St.
Honey or honey of roses, 1½ fl.
vinegar, 2½ fl. oz.; barley water, 1

2. (St. George's.) Oxymel, 1 fl.
tion of barley, 5 fl. drs. In co
throats, &c. The formulæ of se
hospitals are similar.

Gargle of Ac'etate of Ammo
GARGARISMS AMMONIÆ ACETATIS,
(Wendt.) Solution of acetate of a
honey of roses, of each, 1 fl. oz.;
water, 8 fl. oz.; mix. In the ulc
throat of scarlet fever.

Gargle of Ace'tic Acid. *Syn.* Ox
GLE; GARGARISMA ACIDI ACETICI,
1. (St. B. Hosp.) Acetic acid, 1 d
2 fl. drs.; water to make up 4 fl. o

2. Barley water, 12 fl. oz.; acet
fl. oz.; honey, 6 drs. Antiseptic.
throat.

Gargle of Al'um. *Syn.* GARGAR
MINIS, L. *Prep.* 1. (Augustin.)
(in powder), 1 oz.; water, 1½ pint;
pint, filter, cool, and add, of al
brandy, 2 fl. oz. In inflammation of
and throat.

2. (Cavarra.) Alum, 3 drs.; wate
dissolve. In offensive breath.

3. (Foy.) Alum, 1 dr.; tincture
2 fl. drs.; tincture of bark, 4 fl. drs
roses, 2 oz.; laudanum, 20 drops; wi
In scurvy.

4. (Grant.) Alum, 1 oz.; tincture
½ fl. oz.; peppermint water; 7 fl. oz.
tion of the uvula, &c.

5. (Mid. Hosp.) Alum, 1 dr.; ho
water to make 6 fl. oz. As No. 4.

6. (P. Cod.) Alum, 40 grs.; hon
1 oz.; infusion of roses, 6 fl. oz. A

7. (Ratier.) Alum, 1 oz.; infusi
roses and barley water, of each, 3 fl.
of roses, 2 oz. As No. 4.

8. (Westm. Hosp.) Alum, 1 d
sulphuric acid, 1 fl. dr.; treacle, 4 d
to 15 fl. oz.

9. (Ph. Wirtem.) Alum and nit
3 oz.; cream of tartar, 4 oz.; dil
acid, 4 lbs.; dissolve, evaporate to d
powder the residuum. For use,
powder is dissolved in water, 8 fl. o
recommended in inflammation &

ms Zobel's 'SPECIFIC FOR

a'tic. *Syn.* GARGARISMA
L. *Prep.* (P. Cod.) Bitter
ng water, 8 oz.; macerate
add, syrup of honey, 2 oz.;
re, 1 oz.
'tic. *Syn.* GARGARISMA
Prep. (Fr. Hosp.) Decoc-
; camphor, 20 grs.; sal-am-
n putrid sore throat, &c.
gent. *Syn.* GARGARISMA
rep. 1. (Collier.) Tincture
honey, ½ oz.; water, 6 fl. oz.
e uvula and fauces.
oney, 4 drs.; tincture of
wdered alum, 40 grs.; com-
roses, 5½ fl. oz. As the last,
hroat.
r.) Alum, 2 drs.; decoction
oney of roses, 1½ oz.
omson.) Infusion of roses,
phuric acid, 1 fl. dr.; tincture
s.; laudanum, 1½ fl. dr. For
e uvula. See GARGLE OF

x. *Syn.* GARGARISMA BO-
1. (Ellis.) Borax, 1 dr.;
h, 4 fl. drs.; clarified honey,
er, 4 fl. oz.
Borax, 2 drs.; honey or capil-
water, 7 fl. oz.
p.) Borax, 2 drs.; honey of
ey water, 7 fl. oz.
) Borax, 1 dr.; simple oxy-
r, to make 3 fl. oz. The above
ush or aphthous sore mouth,

p'sicum. *Syn.* GARGLE OF
; GARGARISMA CAPSICI, L.
riffith.) Tincture of capsicum,
ter, 8 fl. oz.
p.)—*a.* Capsicum, 3 drs.; com-
boiling water, 1 pint; mace-
, strain, and add of distilled

capsicum, 1 fl. dr.; compound
, 8 fl. oz.
p.) Tincture of capsicum,
drs.; water to 4 fl. oz. *Used*
throat, scarlet fever, &c.
″rate of Potas'sa. *Syn.* GAR-
CHLORATIS, L. *Prep.*
rate of potassa, 1 dr.; honey
water, 7 oz. *Used* in malig-
, scarlatina, &c.
o″ride of Lime. *Syn.* GAR-
CHLORINATÆ, L. *Prep.*
f lime, 1 dr.; water, ½ pint;
for 10 minutes, filter through
f simple syrup, 1 fl. oz. *Used*
oat, scarlet fever, &c.
ride of So'da. *Syn.* GARGA-
ORINATÆ, L. *Prep.* 1. (Cop-
chloride of soda, 12 fl. drs.;
6 fl. oz.

2. (Hosp. Form.) Chlorinated solution of soda, 4 fl. drs.; water to 4 fl. oz. *Used* as the last.

Gargle of Chlo″rine Water. *Syn.* GARGARISMA CHLORINII, L. *Prep.* 1. (Fr. Hosp.) Chlorine water, ½ fl. oz.; syrup, 1 fl. oz.; water, 4½ fl. oz.

2. (Mid. Hosp.) Chlorine water, 2 fl. oz.; distilled water, 10 fl. oz. *Use.* As the last.

Gargle of Cincho'na Bark. *Syn.* GARGARISMA CINCHONÆ, L. *Prep.* 1. From decoction of cinchona, 7 fl. oz.; simple oxymel, 1 fl. oz. Antiseptic and astringent in relaxation, &c.

2. (Acidulated; GARGARISMA CINCHONÆ ACIDUS, L.) Hydrochloric acid, 1½ fl. dr.; honey, 1½ oz.; decoction of bark to make up 8 fl. oz.

Gargle, Com'mon. *Syn.* GARGARISMA COMMUNE, L. *Prep.* 1. (Ed. Hosp.) Water, 6 fl. oz.; nitre, 1 dr.; honey of roses, 1 oz. For ordinary sore throat, &c.

2. (Lond. Hosp.) Alum, 1 dr.; dilute sulphuric acid, 2 fl. drs.; tincture of myrrh, 4 fl. drs.; water to 12 fl. oz.

Gargle of Cy'anide of Mercury. *Syn.* GARGARISMA HYDRARGYRI CYANIDI, L. *Prep.* 1. (Brera.) Cyanide of mercury, 10 grs.; honey of roses, 1 oz.; barley water, 1 pint.

2. (Cullerier.) Cyanide of mercury, 10 grs.; linseed tea, 1 pint. *Used* in the same cases as mercurial gargle.

Deter'gent Gargle. *Syn.* GARGARISMA DETERGENS, L. *Prep.* 1. (P. Cod.) Alcoholised sulphuric acid, 1 fl. dr.; honey of roses, 2 oz.; barley water, 8 oz.

2. (Dr. A. T. Thomson.) Nitre, 2 drs.; honey of roses, 4 fl. drs.; infusion of roses, 5½ fl. oz. In inflammatory sore throat.

Emol'lient Gargle. *Syn.* GARGARISMA EMOLLIENS, L. *Prep.* 1. (Buchan.) Marshmallow root, 1 oz.; figs, 2 oz.; water, 1 quart; boil to a pint and strain. Demulcent, soothing.

2. (Trousseau & Reveil.) Barley water, 8 oz.; honey, 1½ oz. Both are used in inflammatory affections of the throat and mouth.

Gargle of Horserad'ish. *Syn.* GARGARISMA ARMORACIÆ, L. *Prep.* (Collier.) Compound spirit of horseradish, 1 fl. oz.; honey, 2 oz.; water, 4 fl. oz. A good gargle for scurvy of the fauces and pharynx, vulgarly called the 'inward scurvy.'

Gargle of Hydrochlo″ric Acid. *Syn.* MURIATIC ACID GARGLE; GARGARISMA ACIDI HYDROCHLORICI, L. *Prep.* 1. (Guy's Hosp.) Hydrochloric acid, 30 drops; honey of roses, 2 oz.; barley water, 6 fl. oz.

2. (Ratier.) Hydrochloric acid, 2 fl. drs.; clarified honey, 2 fl. oz.; barley water, 1 pint.

3. (St. B. Hosp.) Red-rose leaves, 2 drs.; boiling water, 1 pint; hydrochloric acid, 1½ fl. dr.; digest 1 hour, and strain. In inflammatory sore throat, ulcerations of the mouth, *scarlet fever, &c.*

Gargle of I'odine. *Syn.* GARGARISMA IODINII,

L. *Prep.* 1. Iodine, 10 grs.; iodide of potassium, 12 grs.; rectified spirit and simple syrup, of each, 1 fl. oz.; water, 5 fl. oz. In chronic enlargement of the tonsils, in scrofulous habits.

2. (Dr. Ross.) Tincture of iodine, 1½ fl. dr.; tincture of opium, 1 fl. dr.; water, 6 fl. oz.

3. (St. T. Hosp.) Compound tincture of iodine, 2 fl. drs.; water, 6 fl. oz. In ulceration of the tonsils.

Mercu″rial Gargle. *Syn.* GARGARISMA HYDRARGYRI, G. MERCURIALE, L. *Prep.* 1. (G. HYD. BICHLORIDI.) Corrosive sublimate, 2 to 5 grs.; barley water, 1 pint; honey of roses, 2 fl. oz. For syphilitic ulcers in the throat.

2. (Plenck.) Calomel, 6 grs.; quicksilver, 30 grs.; powdered gum, 3 drs.; syrup of poppies, ½ oz.; triturate till the globules of metal disappear, and add of decoction of clematis, 26 fl. oz.; honey of roses, 1 oz.; essence of myrrh, 1 dr. (or tincture of myrrh, 1 fl. oz.). In syphilitic and putrid sore throat.

Gargle of Myrrh. *Syn.* GARGARISMA MYRRHÆ, L. *Prep.* 1. (Ainslie.) Tincture of myrrh, 6 fl. drs.; vinegar, 1 fl. dr.; honey of roses, 1½ fl. oz.; barley water, 12 fl. oz.

2. (Ph. Chirur.) Tincture of myrrh, ½ oz.; honey of roses, 1½ oz.; lime water, 6 fl. oz. In scarlatina and putrid sore throat. See ASTRINGENT GARGLE, &c.

Gargle of Ni′tre. *Syn.* GARGARISMA SALIS NITRI, G. POTASSÆ NITRATIS, L. *Prep.* 1. Nitre, 2 drs.; honey or syrup, ½ oz.; rose water, 5½ fl. oz.

2. (Brande.) Nitre, 2 drs.; oxymel, 1 fl. oz.; barley water, 7 fl. oz. In inflammatory sore throat. See COMMON GARGLE.

Gargle of Oak-Bark. *Syn.* GARGARISMA CORTICIS QUERCÛS, L. *Prep.* 1. Oak-bark, 2 drs.; boiling water, 6 fl. oz.; macerate 1 hour, and strain.

2. (Ellis.) Decoction of oak-bark, 1 pint; alum, ½ dr.; brandy, 2 fl. oz. In chronic sore throat, relaxation of the uvula, &c.

Gargle of Pel′litory. *Syn.* GARGARISMA PYRETHRI. *Prep.* 1. Pellitory root, 4 drs.; water, 16 fl. oz.; boil to 8 fl. oz., and add of liquor of ammonia, 2 fl. drs.

2. (Swediaur.) Infusion of pellitory, 1 pint; vinegar, 3 fl. oz.; sal-ammoniac, 3 drs. To promote the maturation and healing of throat ulcers.

Gargle of Ro″ses. *Syn.* GARGARISMA ROSÆ, G. ROSARUM, L. *Prep.* (Kendrick.) Conserve of roses, 3 oz.; boiling water, 16 fl. oz.; infuse 1 hour; add of dilute sulphuric acid, 2 fl. drs., and strain. Antiseptic, astringent; *used* in several indications.

Spirit Gargle. *Syn.* GARGARISMA SPIRITUOSUM, G. SPIRITÛS VINI, L. *Prep.* 1. (Dr. Watson.) French brandy, 1 fl. oz.; water, ½ pint.

2. (St. George's.) Proof spirit, 1 fl. oz.; oxymel, 5 fl. drs.; decoction of barley, to make up 6 fl. oz. In relaxations and salivation.

Stim′ulant Gargle. *Syn.*
STIMULANS, L. *Prep.* (Dr.
fusion of roses, 6½ fl. oz.; dil
acid, 40 drops; tincture of
drs.; honey, 3 drs. See GA
SICUM.

Gargle of Tan′nin. *Syn.*
ACIDI TANNICI, L. *Prep.* 1. (
1 dr.; honey of roses, 2 oz.
fl. oz.; distilled water, 8 fl. oz.

2. (Jannart.) As the last,
half the quantity of tannin
and aphthous ulcerations.

Gargle of Verd′igris. *Syn.*
ÆRUGINIS, G. CUPRI ACETA
(Guy's Hosp.) Oxymel of v
honey of roses, 2 oz.; barley
Used as a detergent for ulcer
If swallowed, it produces vi
The addition of 2½ oz. of wat
produces a gargle sufficiently s
cases.

Gargle of Vin′egar. See GA
ACID.

Gargle of Zinc. *Syn.* GAR
G. Z. SULPHATIS, L. *Prep.*
Sulphate of zinc, 20 grs.; ox
rose water, 7 fl. oz. In aphtho
tions, ulceration of the tonsils,

GAR′LIC. *Syn.* ALLIUM, I
sativum of botanists. It is d
retic, expectorant, stimulant,
externally, irritant, rubefacie
vesicant.—*Dose.* ½ dr. to 1½ dr
digestion, chronic diarrhœa, old
atonic dropsies, and worms.
modic and counter-irritant lin
of the juice, which was former
chest diseases and infantile c
small clove of garlic, or a few
juice, was formerly introduced i
certain forms of deafness. As a
properties resemble those of th
which it is much more powerful.

GAR′NET. In *mineralogy*, o
cious stones or gems. The fines
noble garnet (SYRIAN or ORIE
are brought from Pegu. Accor
cal analysis, the garnet is a dou
alumina and lime, coloured w
manganese.

Garnet, Facti″tious. See PAS

GA′RUM. [L.] A species
sauce prepared of fish, in a stat
putrefaction, strongly salted
with aromatics. According t
Romans used a species of lo
purpose.

GAS. *Syn.* GAZ, Fr. A perm
aëriform fluid. In English, t
is now usually restricted to the
ture forming the atmosphere, b
merly used as a synonym for 'g
cipal gases are the elementar
drogen, chlorine, oxygen and nit
compounds ammonia, carbonic

hydrogen, hydrochloric acid,
rogen, protoxide of nitrogen,
ogen, and sulphurous acid.
ices under their respective

OAL GAS, ILLUMINATING G.
is popularly applied to the
e of hydrocarbons produced
distillation of pit-coal, and
a source of artificial light in
rns of Europe and America.
ed in the manufacture of gas
le consists essentially of a
retorts of cast iron or fire-
es from which communicate
c main, in which the crude
of its tar and ammoniacal-
thence into a series of con-
ierein it deposits more of those
thence into another series of
'scrubbers,' in which its
fication is completed. It is
its carbonic acid and sulphu-
in lime-purifiers, and finally
hausting apparatus into the
ing on its way through beau-
ate apparatus, whereby the
ount of gas are regulated and

ists of a mixture of the follow-

gat carbonetted hydrogen).
heavy „ „).

le.

quid hydro-carbons.
ulphide of carbon.
gas, and also the illuminating
product, vary greatly with
of coal. The average yield may
mated at 10,000 cubic feet of
oal.[1]
harles Mansfield proposed to
luminating power of ordinary
render water gas or even atmo-
uminiferous, by passing them
ges or over trays containing
a or benzole; and a patent was
r this purpose. The gas so
or dissolves a portion of the
rns with increased brilliancy.
f saturating the gas with the
bon is as follows:—"The appa-
f a brass reservoir or chamber
end of the gas-pipe, near the
reservoir may be in the shape
made air-tight, with a screw-
means of supplying any highly
rpentine, or mineral naphtha,
kept about half full. Into this
gas-pipe ascends a little above
the oil; a very small jet-pipe of gas, regulated by a stop-cock, is branched off below this chamber, to supply a minute flame, so as to cause a sufficient evaporation from the oil to unite with the gas in the flask receiver. The whole is, of course, surmounted with the usual burner and lamp-glass."

The naphthalising of gas did not work well on a large scale. Recently, however, an attempt was made to get up a company in England to work a French patented process, which differed only from that of Mansfield's in the substitution of another hydrocarbon (probably a petroleum product) for benzol. The chemical and technical journals exposed M. Mongruel's invention, and prevented the sinking of capital in a worthless undertaking. On a small scale, simple 'naphthalisers' appear to work very well.

The illuminating power of gas, as well as of other sources of light, may be directly ascertained by what is termed the 'comparison of shadows,' or indirectly, and more conveniently, by chemical analysis.[2] See ILLUMINATION.

GAZ'OGENE. [Fr.] *Syn.* AËRATING MACHINE. A portable apparatus for aërating water and other liquids. Many forms have been given to this instrument, but in all the principle is the same. Powders for generating carbonic acid gas are placed in a separate compartment, and the liquid to be aërated in another. The two compartments are connected by a suitable tube, and a second tube, furnished with a spring tap, affords an exit for the aërated liquid. By the aid of the gazogene, water, wine, ale, &c., may in a few minutes be fully saturated with carbonic acid gas, and so rendered brisk and piquant. By using fruit syrups, manufactured from English and foreign fruits, the most delicious aërated summer beverages can be made, resembling those so much esteemed by travellers in the South of Europe and the sea-board cities of the Western world.

GEL'ATIN. *Syn.* GELATINE; GÉLATINE, Fr.; GELATINA, L. Animal jelly, obtained by the action of heat on the organic tissue of the bones, tendons, and ligaments, the cellular tissue, the skin, and the serous membranes, whilst in contact with water. Glue and size are coarse varieties of gelatin, prepared from hoofs, hides, skins, &c.; and isinglass is a purer kind, obtained from the air-bladders and some other membranes of fish.

Prop, &c. Gelatin is insoluble in cold water, but dissolves with greater or less readiness on the application of heat, according to the source whence it is obtained, and in this state forms a tremulous and transparent jelly on cooling; it is insoluble in both alcohol and ether, and is decomposed by the strong alkalies and acids; with tannic acid it forms an insoluble compound of a buff colour, which is the basis of leather; when acted on by cold mercury gives a whitish flocculent precipitate. -- 4. Tannic acid or infusion of galls gives a copious yellowish-white, curdy precipitate, which, on being stirred, coheres into an elastic mass, insoluble in water, and incapable of putrefaction, and which, when dried, assumes the appearance of over-tanned leather.- 5. The gelatinising property is destroyed by nitric acid.– 6. It is not affected by either alum or acetate of lead. In this respect it differs from chondrin.

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[1] details respecting the manufacture of
he article COAL GAS in 'Ure's Diction-
ctures, &c.'

[2] See 'Watts's Dictionary of Chemistry,' vol. i.

Qual. The goodness of commercial gelatin intended for food is readily proved by pouring boiling water over it, and digesting the two together for a short time. If it is pure and wholesome, its colour remains unaltered, and during its solution it continues entirely free from smell. The resulting solution and jelly are also odourless, neutral to test-paper, free from unpleasant taste, and perfectly transparent. If it forms a yellow gluey-looking mass, and evolves an offensive odour, it should be rejected as of inferior quality, and unfit for culinary purposes.

Uses, &c. Gelatin is largely employed as an article of food, as in soups, jellies, &c.; but its value in this respect has been, perhaps, overrated. Animals fed exclusively on gelatin die of starvation. But when mixed with other food, especially with substances abounding in albumen, casein, or fibrin, gelatin may be useful as an aliment, and serve directly to nourish the gelatinous tissues. (Liebig.) Hence gelatin is a fitting substance to form part (but only a part) of the diet of convalescents, as it conveys nutrition directly to these tissues, without tasking the diminished powers of life for its conversion; but its use should be accompanied by a proper quantity of azotised animal

tin, or a quantity equal
meat from which it is c
other varieties of gel
blanched by sulphurous a
cool, and tinged of vario
ordinary vegetable dyes.
with sulphate of indigo
berries; green, with the
and red, with juice of red

French Gelatin. *Syn.*
Gelatin done up into sm
the finer sorts of glue.
it is prepared in Paris
of the skins used in mak
slippers.

Patent Gelatin. Variou
tin are manufactured from
tings of the hides of beasts
and from inferior isingla
Mr. Nelson's specification,
freed from hair, wool, flesh,
thoroughly washed and
rated for 10 days in a ley o
are then placed in covere
perature varying from 60°
they become tender; they
free them from alkali, and
the vapour of burning sulph
a sensibly acid reaction; th
in water contained in earth
150° Fahr., and the sol
strained, is put into 'se
heated to 100° to 120° Fah
at the end of this time the
off, and poured on the 'co
depth of about ½ an inc
jelly is cold, it is cut into
in water until perfectly fr
then redissolved in water

ı of jellies, soups, and blanc-
re not much inferior.

in. *Syn.* Gelatine Brut, Fr.
s of oxen, the spongy insides of
ribs, and from several other soft
prived of fat), by washing them
sting in an equal weight of
cid of 6° Baume, in cold weather,
ı summer, for 10 days, then in
.° Baume for 24 hours longer;
king and washing in successive
old water until all the acid is
dding an ounce of carbonate of
t water. Used to make glue, &c.
cle is prepared from the bones of
ieces, after being treated as above,
ı boiling water for a few minutes,
nd shaken together in a bag to
ternal pellicle; after which they
quares or dice to disguise them,
pped into a hot solution of gela-
a them. In this state the article
LATINE BRUT FIN.' Used to make
eeps better than the cakes of
p. When less carefully prepared,
sed to make glue for fine work.

ELATIN.

pour le Goitre). See Liniment
of Potassium.

ys. Jewels; Gemmæ, L. "Gems
s stones, which, by their colour,
ustre, brilliant polish, purity, and
sought after as objects of dress
tion. They form the principal
: crown jewels of kings, not only
beauty, but because they are sup-
omprise the greatest value in the
ılk; for a diamond, no larger than
n acorn, may be the representative
the territorial value of a whole
he equivalent in commercial ex-
r a hundred fortunes, acquired by
s and privations." "Among these
minerals mankind have agreed in
ı select class, to which the title of
ewels has been appropriated; while
precious stone is more particularly
ubstances which often occur under a
siderable volume than fine stones
Diamonds, sapphires, emeralds,
pazes, hyacinths, and chrysoberyls,
med the most valuable gems;—
: quartz, pellucid, opalescent, or of
es, amethyst, lapis lazuli, malachite, jasper, agate, &c., are ranked in the much more numerous and inferior class of ornamental stones." (Ure.)

Tests. The only tests applicable to gems and precious stones are the determination of their relative hardness and their specific gravity. By the first test, pastes or factitious gems are readily detected; but beyond this, owing to the difficulty of applying it, it ceases to be useful to persons unconnected with the trade. The determination of the specific gravity is, however, of more general application, as gems are generally dismounted when offered for sale, or are so set that they may be removed from their 'mountings' without injury or inconvenience. See Specific Gravity, and *below*.

Obs. The relative hardness of the different substances is measured by the power they possess of cutting or scratching the other substances having a smaller number attached to them in the table. Thus, no gem but the DIAMOND (20) will scratch either the RUBY (17) or the SAPPHIRE (16); and, for the same reason, a blue stone that will cut the EMERALD or the TOPAZ can be no other than the SAPPHIRE. The sp. gr. is ascertained in the usual manner, and will be found sufficiently indicative of the true nature of the stone when considered in connection with its other characteristics. The index of refraction is a certain key to the quality of the stone, in the hands of those who are capable of determining it, and may be applied to either mounted or unmounted gems. The most convenient instrument for the purpose is Wollaston's 'REFLECTING GONIOMETER.'

Gems, Facti''tious. These, with few exceptions, are made of very pure, fusible, highly transparent, and dense glass, usually termed 'PASTE' or 'STRASS,' which is generally formed of oxide of lead, potassa, and silica, with small quantities of other ingredients to increase the brilliancy and clearness. The characteristic tints are imparted by the addition of metallic oxides. The beauty of artificial stones and gems depends, chiefly, upon the tint of the real stones being exactly imitated, and upon proper care and skill being exercised in the cutting, polishing, and mounting them. All the coloured glasses, and enamels, may be worked up into artificial gems. See Enamels, Pastes, &c.

TABLE *of the Hardness, Specific Gravity, and Refractive Power, of the princip* PRECIOUS STONES, *and some other* MINERALS; *compiled expressly for th*

Name.	Relative Hardness.	Specific Gravity.	Index of Re
Agate	12	2·6	
Amethyst (occidental)	11	2·7	
Calcareous spar	6	2·7	
Chalk	3	2·7	
Chrysolite	10	3·7	
Cornelian	11	2·7	
Crystal	11	2·6	
Diamond (bluish)	19	3·3	2·43
„ (cubic)	18	3·2	
„ (from Ormus)	20	3·7	
„ (pink)	19	3·4	
„ (yellowish)	19	3·3	
„ (average colourless	19 to 20	3·3 to 3·55	
Emerald	12	2·8	
Fluor spar	7	3·5	1·43
Garnet	12	4·4	1·81
Glass	various	2·3 to 3·62	1·525 to
„ (crystal or flint)		3·0 „ 3·6	1·830 „
„ (plate)		2·5 „ 2·6	1·514 „
Gypsum	5	2·3	
Jasper (green)	11	2·7	
„ (reddish yellow)	9	2·6	
Onyx	12	2·6	
Opal	10	2·6	
Quartz	10	2·7	1·54
Ruby	17	4·2	1·77
„ (pale, from Brazil)	16	3·5	
„ (spinelle)	13	3·4	1·76
Sapphire (deep blue)	16	3·8	1·79
„ (paler)	17	3·8	
Sardonyx	12	2·6	
Schoerl	10	3·6	
Topaz	15	4·2	
„ (Bohemian)	11	2·8	
„ (whitish)	14	3·5	
Tourmaline	10	3·0	
Zeolite	8	2·1	
Zircon	—	—	1·96

GENE'VA. See GIN and HOLLANDS.

GEN'TIAN ROOT. *Syn.* GENTIANÆ RADIX, L. The dried root of *Gentiana lutea,* or yellow gentian." *Dose.* 10 to 30 grs.; as a simple bitter, tonic, and stomachic, in dyspepsia, loss of appetite, gout, &c. It was formerly a favourite remedy in agues. "Joined with galls or tormentil, and given in sufficient quantity, it has not failed in any intermittents in which I have tried it." (Dr. Cullen.) In excessive doses it is apt to relax the bowels and disturb the system. When taken for some time, it imparts its bitter flavour to the perspiration and urine. See DECOCTION, EXTRACT, &c.

GEN'TIANIN. *Syn.* GENTIANINE; GENTIANINA, L. A substance obtained by MM. Henry and Caventou from the root of common gentian.

Prep. 1. Gentian root (in p gested for 2 or 3 days in col agitation, and the filtered tinctu to dryness; the residuum is diss fied spirit, and the solution is agai the semi-crystalline mass is, lastl in either alcohol or ether, and c careful evaporation.

2. (Magendie.) The ethereal hausted with cold alcohol (rectif before, and the resulting tincture to dryness; the residuum is dissol calcined magnesia added in exc whole boiled and filtered; the se gested in ether, and the ethe allowed to crystallise by slow eva

Prop., &c. Gentianin forms needles, scarcely soluble in cold very soluble in alcohol and

and stomachic. *Dose.* ½ gr.

ASTE. *Prep.* From pea-meal,
monds (blanched), 1 lb.; fresh
½ lb.; moist sugar, 5 oz.; hay
eat to a smooth paste, adding
granulate the mass by passing
lander, and expose the product
warm place, until quite hard
addition of 2 or 3 eggs im-
ed to feed larks, nightingales,
ctivorous birds. It will keep
nths in a dry place.

ILVER. *Syn.* Albata, Ar-
trum, Nickel Silver, Tu-
nian Plate, White Copper.
alloy, the finer varieties of
equal silver in whiteness and
f receiving a high polish, whilst
it in hardness and durability.
formulæ are from the highest
are the results of actual analysis
mmercial samples:—

Copper, 50 parts; nickel, 20
0 parts. Very malleable, and
olish.

0 parts; nickel, 26 parts; zinc,
sely resembles silver; an ex-
.

nd zinc, of each, 41 parts; nickel,
ther brittle.

dorff.) Copper, 50 parts; nickel
ach, 25 parts. Very white and
d takes a high polish. Recom-
eneral substitute for silver.

ff.) Copper, 60 parts; nickel
each, 20 parts. For castings, as
ticks, &c.

ff.) Copper, 60 parts; nickel, 25
20 parts. For rolling and wire.
nd malleable.

made from the ore of Hilburgh-
per, 40½ parts; nickel, 31½ parts;
s; zinc, 25½ parts. Equal to the
sample.

e.) Copper and nickel, equal parts.
ed by M. Pelouze as superior to
lloys containing zinc.

a.) Copper, 2 parts; nickel, 1
so white as the last, but more

e Copper from China.)—*a.* Copper,
ickel, 36 parts; zinc, 34 parts.

to be prepared from native ore.)
parts; nickel, 32 parts; iron, 2½
, 24½ parts. Silvery white, takes
sh, very sonorous, malleable both
a dull-red heat, and may be rolled
or formed into wire.

ite metal spoon, sold as 'German
opper, 55 parts; nickel, 24 parts;
ts; tin, 3 parts; iron, 2 parts.

his may be briefly described as
s 100 grs. of the alloy is digested
id, q. s., diluted with a little water.
ple is unequally attacked by the acid, and a white external shell is observed which dissolves more slowly than the internal portion, it is 'plated' on those parts with silver. If this silver shell or casing has a polished surface on both sides, the article has been 'electro-plated;' if the contrary is the case, it has most probably been plated in the usual way.

b. The solution being completed, heat is applied to expel the excess of acid, and the remainder is largely diluted with distilled water; dilute hydrochloric acid is now dropped in as long as it occasions a precipitate, and the whole, after being moderately heated for a short time, and cooled, is thrown upon a small paper filter; the precipitate on the filter is next washed with distilled water, carefully dried, and ignited in a small porcelain crucible, the filter itself being separately burnt on the cover of the crucible, and the ashes added to its contents prior to ignition. Every 143½ grs. of the resulting fused chloride is equal to 108 grs. of metallic silver.

c. The filtered liquid (see *b*) is next treated with a stream of sulphuretted hydrogen, and the black precipitate is collected, washed, and digested in strong nitric acid; when the solution is complete, sulphuric acid is dropped in, to precipitate the lead (if any is present); if a precipitate is formed, the whole is evaporated to dryness, and the excess of sulphuric acid expelled by a rather strong heat applied towards the end; the dry mass is now collected on a filter, washed with a mixture of water and alcohol, dried, and exposed to slight ignition in a porcelain crucible. Every 152 grs. of the resulting dry sulphate is equal to 104 grs. of lead.

d. The liquor filtered from the sulphate of lead, or (in its absence) the nitric solution of the precipitate produced by the sulphuretted hydrogen (see *c*), is next treated with potassa, &c., as described under the analysis of brass. Every 40 grs. of the dry protoxide thus obtained represents 32 grs. of pure copper.

e. The liquor which was filtered from the precipitate produced by the sulphuretted hydrogen (see *c*) is boiled until it loses its offensive odour, and is then precipitated with carbonate of soda, in slight excess, and again boiled for a few minutes; the precipitate (mixed oxides of nickel and zinc) is collected, washed, and redissolved in dilute acetic or nitric acid, in excess; a current of sulphuretted hydrogen is next passed through the solution, the precipitate collected on a filter, washed, redissolved in hydrochloric acid, and the solution again treated with carbonate of soda; the last precipitate (oxide of zinc) is washed, dried, and gently ignited. Every 40 grs. of this oxide is equivalent to 32 grs. of metallic zinc.

f. The washings of the precipitated oxides and the liquid filtered from the precipitate occasioned by the sulphuretted hydrogen (see *e*) are mixed together, pure solution of ammonia added in considerable excess, and the mixture agitated for some time; the undissolved portion of the precipitate is then collected on a filter, washed with distilled water, redissolved in dilute nitric acid, again precipitated with solution of potassa, and this last precipitate (ferric oxide) washed, dried, ignited, and weighed. Every 80 grs. represents 50 grs. of metallic iron.

g. The ammoniacal solution filtered from the precipitate of sesquioxide of iron (see *f*) is precipitated with pure solution of potassa, boiled for a few minutes, and, when cold, thrown on a filter; the precipitate is, lastly, washed with hot water, dried, ignited, and weighed. Every 37¼ grs. of the oxide thus obtained is equal to 29¼ grs. of metallic nickel.

Obs. The manufacture of nickel or German silver has of late acquired an importance which is second only to that of silver plate itself. The superior quality of this alloy, and the graceful patterns which it is often made to assume in the hands of the accomplished artist, cannot fail to have attracted the admiration of the majority of our readers. The value of correct information regarding the preparation of this alloy, and of a ready method of determining the composition of the most improved commercial samples, will, therefore, be fully appreciated by every metallurgist who wishes to throw his wares into the arena of public competition. Much that is vended under the name of GERMAN SILVER is little better than the BRITANNIA METAL or PLATE PEWTER formerly so plentiful in every establishment in this country. German silver has quite superseded copper as the basis of 'electro-plated goods.'[1]

The union of the metals in the above formulæ is effected by heat, with the usual precautions. When iron is ordered, it is generally added under the form of 'tin plate.' See ALLOY, BRASS, BRITANNIA METAL, BRONZE, &c.

GER'MAN TIN'DER. See AMADOU.

GERMINA'TION. The growth or vegetation of a seed by which a young plant is produced. The conditions essential to germination are the presence of warmth, air, and moisture. The most favorable temperature is between 60° and 85° Fahr., according to the habitat of the respective plants. Below 40° Fahr. most of the more perfect seeds either refuse to vegetate, or vegetate slowly and feebly; and at or near the freezing-point none of them undergo this change. At a temperature above 100° Fahr. the young germ is usually injured, and at about 125°, if it forms, it soon withers and dies. See MALTING, SEED, &c.

GHEE. A sort of butter used by the natives of India. *Prep.* Milk is boiled in large earthen pots for an hour or two, then allowed to cool, a little curdled milk called 'dhye' being added, in order to make the whole coagulate.
After a lapse of some hours
each to the depth of 5 or 6 in
and placed in a larger earthe
which they are churned by
of split bamboo for about hal
hot water is poured in, and th
tinued for half an hour lon
time the butter is found to be
this becomes rancid, it is melt
vessel, and boiled until all th
porated; after which a little
is put into it, and finally it i
suitable vessels in which it
from the air. Bottles are co
this purpose. See BUTTER.

GHER'KINS. *Syn.* GIR'
cumbers adapted for pickling

GILD'ING. *Syn.* DORURE
process of covering the surfa
a thin film of gold, for the p
ing their durability or im
pearance. For the sake of
briefly notice the leading
ing, and their application
order.

BURNISHED GILDING.
gilding to which a 'face' ha
the 'burnisher.' It is chi
the polished portions of the
and mirrors, the more promi
tuettes, &c.

CHEMICAL GILDING. T
which the film of gold is f
face through the agency of
opposition to mechanical gil
gold is made to adhere by t
some glutinous substance.

COLD GILDING. The a
brass) to be gilded, after b
nealed, and polished, in the
rubbed with a little gilding
of a piece of cork moistened
salt in water; after which
nished with a piece of hen
steel. (See *below*.)

DISTEMPER GILDING. T
wood, plaster, marble, &c.
performed in this country by
first, a coating of good size.
successive coats of size thic
powdered whiting, Spanish w
Paris, until a good face is
ing to let each coat become
rub it perfectly smooth with
before the application of t
When the proper 'face' is
face is thinly and evenly go
size, and when this is nearly
is applied, and aftewards b
agate or a dog's tooth. The
by the Parisian artists, who
this species of gilding, is
and is divided into at least
tions, each of which they dec
to its excellence.

ELECTRO-GILDING. See E

---

[1] See ELECTROTYPE.

DING. In this variety sal-
rrosive sublimate, equal parts,
nitric acid, and a solution of
this menstruum; after slight
e liquid is applied to the sur-
which immediately becomes
being heated exhibits a rich

GILDING. The surface is co-
se thinned with spirits of tur-
d, in powder, is gently dabbed
of wash leather. This gives
of 'frosted gold.' A coating
xt given, followed by exposure
in the 'stove.'

IG. This term is commonly
ilding of paper, vellum, &c., by
gold to the surface, previously
coating of gum water, size, or
It is usually burnished with an
tooth.

GILDING. See CHEMICAL GILD-

GILDING. See WASH GILDING

. This species of gilding may
several operations. The fol-
abridged instructions of a Pa-
the subject:—1. The surface
coating of white lead in dry-
other coat is given, made with
lead or massicot, ground in lin-
rpentine. 3 or 4 coats of this
en given, at intervals of at least
rving to carefully smooth off
pumice stone or shave grass be-
ation of the following ones.—
Colour,' or paint, is next applied.
ery adhesive gold size, or the
pot or dish in which painters
ushes. For this purpose it is
ound and strained.—4. When
becomes partially dry and suf-
ous, the gold leaf is applied, and
th a wad of cotton-wool or a
t is now left for several days to
coat of spirit varnish is next
object is cautiously passed over
of charcoal, observing to avoid
notion of the piece whilst doing
k would then become discoloured
—6. The work is 'finished off'
arnish. For out-door gilding and
, the varnishing process is gene-
l. This species of gilding is
odwork, plaster, metal, &c.

GILDING. This is a mere variety
, applied to equipages, furniture,
picture frames, &c., the surface
varnished and polished before it
size or gold colour; and after the
ecome quite dry, a coat of spirit
d with the chafing dish as above,
llowed by 2, 3, or more coats of
al *varnish, at intervals of 3 or 4* days each. The whole is, lastly, carefully polished with tripoli and water.

WASH GILDING, AMALGAM G., MERCURIAL G., WATER G. This consists in the application of a thin coating of amalgam of gold to the metallic surface (brass, bronze, or copper) to be gilded, and the subsequent volatilisation of the mercury by heat. It is the usual method of gilding articles of copper and its alloys, and possesses great beauty and durability when skilfully executed. The occupation is, however, an unhealthy one, owing to the continual exposure of the workman to the fumes of mercury. The furnace invented by M. D'Arcet obviates this evil, as the whole of the volatilised mercury is carried off, and again condensed for further use. It should, therefore, be adopted by every water-gilder who studies economy and the health of those in his employ.

The process of water gilding consists in several distinct operations, and can only be successfully performed by those who have been schooled in the art by an apprenticeship to the trade. It would, therefore, be waste of space to enter into details here. Formulæ for several of the articles employed for the purpose will be found in their alphabetical places in this work.

WATER GILDING. See *above*.

Among the applications of the process of gilding that deserve a separate notice are the following:—

The gold letters and figures on the covers of BOOKS are thus formed:—Gum mastic, in fine powder, is dusted over the surface to be gilded; an iron or brass tool bearing the design upon its face is then heated to a proper temperature, and gently pressed upon a piece of leaf gold, which slightly adheres to it; the two are then transferred to the cover, and the tool is gently pressed on it, by which means the mastic softens and retains the gold. The loose gold and powdered mastic are then dusted off with a brush. Gold leaf will adhere to leather without the use of mastic, but not so firmly as when it is employed.

The edges of the leaves of books and paper are first cut perfectly smooth, and then washed over with a solution of isinglass in weak spirit, or with a varnish made of Armenian bole, 4 parts, and powdered sugar-candy, 1 part, mixed up to a proper consistence with strained white of egg. The coating is allowed to dry, and is then smoothed with a wet rag, after which the gold leaf is applied and polished with the burnisher.

BRASS BUTTONS, formerly so much in demand, are covered by a rough species of wash gilding. The buttons are polished in the lathe, and thrown into a pan with a little amalgam of gold, and as much aquafortis diluted with water as will wet them all over. Here they are well stirred up, until they assume a *silvery appearance*, when they are washed with *clean water*. They are then submitted to a sufficient heat in a suitable apparatus, until the mercury is volatilised. The buttons are next cooled, and well tossed and rubbed about with a painter's brush; and are, lastly, burnished by washing them well with beer or ale grounds.

Twelve dozen (1 gross) of buttons, of 1 inch in diameter, may be perfectly gilded on both sides with only 5 grs. of gold. By an Act of Parliament, which is still unrepealed, this is the smallest quantity of gold permitted to be used for a gross of buttons of the above size.

GLASS, PORCELAIN, and EARTHENWARE, are gilded by blending powdered gold with gum-water and a little borax, and applying the mixture by means of a camel-hair pencil; the article is then heated in an oven or furnace, by which means the gum is burnt, and the borax, vitrifying, cements the gold to the surface. It is afterwards polished with a burnisher. Names, dates, or any fancy device, may thus be permanently and easily fixed on glass, china, earthenware, &c.

JAPANNED WORK is gilded by the method explained as 'Japanner's gilding' (*above*).

LEATHER is gilded in the same way as the covers of books. (See *above*.) For common work, silver leaf, or even tin foil, is applied to the surface, previously covered with size or white of egg, and after being burnished down and dried, is washed over with gold-coloured lacquer.

The LETTERS of sign-boards and the ornamental gilding for out-door work are done by first covering the design with yellow paint, then with oil gold-size, and when this is nearly dry applying the leaf-gold, observing to shield it properly from the wind, lest it be blown away or become crumpled before being properly attached. The work is, lastly, varnished.

POLISHED METALS may be gilded by one or other of the methods already noticed. Articles in silver, copper, brass, and bronze, are usually coated by the process of wash or water gilding; or, directly, by the application of gold leaf, as follows: — The piece or article is heated to a bluish tint, and gold leaf pressed gently and carefully on it with the burnisher; heat is again applied, and the process repeated with fresh leaves of gold until the gilding has acquired the proper thickness and tone. The surface is lastly polished with the burnisher, or is coloured in the usual manner at the stove. This succeeds with iron, steel, silver, copper and its alloys, &c. Another method for polished articles in iron and steel, which, however, is less durable than the preceding, is to apply an ethereal solution of gold to the surface with a camel-hair pencil. The ether flies off and leaves the surface coated with gold, which is then polished as before. In this way, any fancy device or writing may be executed on steel or iron with extreme facility.

SILKS, SATINS, WOOLLENS, IVORY, BONE, &c., may be readily gilded by immersing them in a solution of neutral terchloride of gold (1 of the salt, and 3 to 6 of water), s
posing them to the action of h
The latter part of the process m
performed by pouring some dil
acid on zinc or iron filings, in a w
bottle, and placing it under a j
vessel, inverted, at the top of wl
cles to be gilded are suspended.
other ornamental designs may be
painting them on the surface w
hair pencil dipped in the soluti
sign, after a few minutes' ex
hydrogen, shines with all the spl
purest gold, and will not tarnish
to the air, or in washing.

GILDED THREAD OF GOLD THR
a thread of yellow silk covered
thin flatted wire of gold, by m
volving wheel.

WIRE (copper, silver, or brass) i
gilded, in coils, by a similar p
adopted for BUTTONS; but more
follows:—Rods (usually of silve
with gold foil of a thickness pro
the quality of the intended w
compound bar is then drawn int
usual way. 100 grs. of gold wa
lowest legal quantity that could
for 1 lb. of silver.

Patents. Among the varietie
gilding may be mentioned—

1. (Elkington's patent—GERM
Bonnet's GILDING PROCESS.) T
be gilded, after being perfectly
scale or grease, and receiving a
are suspended, by means of wires,
liquid (boiling hot), and moved
for a period varying from a few
minute, or longer; the precise t
depending on the newness and st
liquid. When sufficiently gilded
are withdrawn from the 'solut
washed in clean water, and dried
they undergo the usual operation
&c. A dead gold appearance is
the application to the articles of a
of nitrate of mercury previously
sion in the gilding liquor; or t
may be given by applying a so
nitrate to the newly gilded surf
expelling the mercury by heat.

The gilding liquor.—Take of f
(troy); nitro-muriatic acid, 5
dupois); dissolve by heat, and
heat until red or yellow vapour
evolved; decant the clear liquid
able vessel; add of distilled w
pure bicarbonate of potassa, 20 lbs
2 hours. The nitro-muriatic aci
pure nitric acid (sp. gr. 1·45),
muriatic acid (sp. gr. 1·15), 17
tilled water, 14 oz.

This process, though patente
kington in England, was in reali
and first practised by M. Bonnet
Articles thus gilded do not bea

ng put in colour (*mise en*
those gilded by the mer-
r the methods of cold or
:d to polished metals.

t.) By this process polished
gilded by simple immersion
ic acid in water, ether, or
solution of gold has been
SILVERING and PLATI-
ected in the same manner,
of either of these metals
ld.

other chemical processes
completely superseded by
omical process of ELECTRO-
CTROTYPE.

a. See AMALGAM.

This name has been given
of gold, and to other liquids
g. The former are noticed
the latter are the following:

AFORTIS. From mercury,
(sp. gr. 1·33), 3 parts; dis-
soft water, 7 parts. Used
-gold effect. It is applied
ticles, before spreading the
m, in water gilding; or be-
in the 'gilding liquor,' in
sses.

UTION. From mercury, 10
aquafortis (sp. gr. 1·33), 11
ution diluted with 25 times
ter. Used to moisten the
efore drawing it over the
urial gilding; also to deaden
e, by moistening the latter
exposing the piece to a heat
o drive off the mercury.

LR. From alum and common
.; nitre, 2 oz.; dissolved in
sed to impart a rich colour to
ecially of trinkets. Its ap-
ot be too long continued, as
ll portion of the gold. For
it is best used largely di-

MEIL COATING, OR-MOLU C.
l salt of tartar, of each, 1 oz.;
oz.; water, 1 quart; simmer
e fourth, add saffron, 20 grs.,
r tepid, strain through fine
le. Used to give lustre and
gilding. A little is floated
with a very soft, flat, camel-

The metal employed as a
s usually brass, or a mixture
per. The following propor-
ecommended:—

arts; brass, 1 part.

arts; Bristol brass, 1 part.

parts; old Bristol brass, 3
rts.

E. *Prep.* 1. Pure gold, 5
r, 1 dr.; *aqua regia,* 10 *oz.;*
clean linen rags with the solution, dry them, and burn them to ashes. The latter contain the gold in a state of minute division, and must be carefully collected.

2. Grain gold, 1 dr.; rose copper, 15 grs.; aqua regia, 2 fl. oz.; proceed as last. Used in 'Gold Gilding.'

3. See Gold (in powder).

Gilding Shells. See GOLD SHELLS.

Gilding Size. See GOLD SIZE.

Gilding Wax. *Syn.* GILDING VARNISH, GILDER'S WAX. *Prep.* 1. From bees' wax, 4 oz.; verdigris and sulphate of copper, of each, 1 oz.; melted together.

2. Bees' wax, 4 oz.; verdigris, red ochre, and alum, of each, 1 oz. Used to give a red gold colour to water gilding.

GIN. *Syn.* GENE'VA. Corn spirit flavoured with either oil of juniper or oil of turpentine.

Gin was originally and, for some time, wholly imported from Holland, and was a rich, soft spirit, flavoured, chiefly, with juniper berries; on which account it had obtained the name of 'GENEVA,' from 'GENIÈVRE,' the French for juniper. After a time the distillation of an imitation geneva sprung up in this country, when the foreign spirit came to be called 'HOLLANDS,' or 'HOLLANDS GENEVA,' to distinguish it from the spirit of home manufacture. The English monosyllable 'GIN' is a corruption of geneva, the primary syllable of which, as in numerous other instances, was seized on by the vulgar, and adopted as a short and convenient substitute for the whole word.

The liquor at present known by the name of 'gin' in this country is a very different article to that imported from Holland, and consists of plain corn-spirit, flavoured with oil of turpentine and small quantities of certain aromatics. The thousand and one receipts for this article, which have from time to time been printed in books, produce a flavoured spirit bearing no resemblance to the more esteemed samples of English gin; and, if possible, the products are even more unlike genuine Hollands. Any person may easily satisfy himself of the truth of this assertion by actual experiment on the small scale. The cause of this incongruity has arisen chiefly from the writers not being practically acquainted with the subject, and from the disinclination of well-informed practical men to divulge, gratuitously, what they conceive to be valuable secrets. Hence the utter failure of any attempts to produce either gin or Hollands from the receipts usually published. The authors appear to have all imbibed a juniper-berry mania—probably from the imbibition of their favourite beverage. Oil of juniper, in the hands of these gentlemen, appears to be a perfect aqua mirabilis, that readily converts whiskey into gin, and imparts the rich creamy flavour of 'Schiedam Hollands' *to crude corn* or molasses spirit. But theory *and experiment* sometimes disagree. In practice, it is found that the true flavour of foreign geneva cannot be imparted to spirit by juniper alone, and that the English gin of the present day depends for its flavour on no such a substance. The following formulæ are merely given as specimens; and it is proper to remark, that every distiller has his own receipt for this notorious beverage. Hence it is that the gins of no two distillers are of precisely the same flavour; and this difference is still more marked when the distillers reside in parts of the country remote from each other. Booth's, Smith's, and Nicholson's gins have each a characteristic flavour, readily perceived by their respective votaries; whilst the difference between 'Plymouth' or 'Bristol gin,' and the 'gin of the metropolis,' is as remarkable as that between 'Barclay's XXX' and 'Guinness's bottled stout.' These variations in flavour generally depend on the use of more or less flavouring matter, or of a spirit more or less clean or free from taint; and, less frequently, on the addition of a small quantity of some peculiar aromatic, which exercises a modifying influence on the chief flavouring ingredient. In many cases the flavour has originated from accident, but the consumers having become accustomed to, and hence relishing, that particular 'palate,' it is found to be unwise or commercially impossible to alter it. Any change in these matters is therefore looked upon in every distillery as a dangerous innovation, which would prove more prejudicial to the prosperity of its exchequer than the repeal of the duty on French wines and brandy, or even a frightful conflagration. The distillers, like the brewers, are thorough conservatives in all matters connected with the flavour of their liquors.

In the preparation of gin, both sweetened and unsweetened, and indeed of liquors generally, the greatest possible care must be taken to avoid an excess of flavouring. The most esteemed samples are those that consist of very pure spirit, slightly flavoured.

Prep. 1. Clean corn spirit, at proof, 80 galls.; newly rectified oil of turpentine, 1½ pint; mix well by violent agitation, add culinary salt, 14 lbs., dissolved in water, 40 galls.; again well agitate, and distil over 100 gallons, or until the faints begin to rise. *Product.* 100 galls. of gin 22 u. p., besides 2 galls. contained in the faints. If 100 galls. at 17 u. p. are required, 85 galls. of proof spirit, or its equivalent at any other strength, must be employed.

2. Proof spirit (as above), 8 galls.; oil of turpentine, 1 fl. oz.; salt, 1½ lb., dissolved in water, 4 galls.; draw over 10 galls., as before. 22 u. p.

3. Clean corn spirit, 80 galls.; oil of turpentine, 1 pint; pure oil of juniper, 3 fl. oz.; salt, 21 lbs.; water, 35 galls.; draw over 100 galls., as before. 22 u. p.

4. To the last, before distillation, add, of
oil of caraway, ½ fl. oz.; oil of
¼ fl. oz.; cardamoms (ground),

5. To No. 3, add, of essential
dr.; essence of lemon, 4 drs.

6. To No. 1, before distil
creasote, 3 fl. drs.

7. To No. 3, add of creasote,

8. Proof spirit, 80 galls.; oi
¾ pint; oil of juniper, ½ pint;
oranges and lemons, sliced, of
macerate for a week, and d
22 u. p.

9. To No. 1, add of rectified

10. To No. 1, add of oil of ju

Concluding remarks. The
for this purpose should be of t
and not that usually vended
which always contains resin
oil. Juniper berries, bitter al
aromatic seeds, may be used
essential oils; but the latter
convenient. Turpentine conve
flavour,—juniper berries or oi
lands flavour,—creasote imp
degree of smokiness, or whi
lemon and the other aromat
ness, fulness, and richness.
imparted by cardamoms, wh
ciously, is peculiarly agreeab
priate. That from caraways is
esteem. Cassia in extremely sı
also tells well. Fusel oil giv
gin flavour; and in conjunctio
or crude pyroligneous acid, a
flavour. The only danger in t
of all these articles is using too
When this misfortune happens,
to add sufficient plain spirit
flavour to the proper standard.
ness and smoothness so muc
'foreign geneva' results chie
The English rectifier endeavo
this by the addition of a little
mellowness, that combines w
turning on the 'Hollands fla
by a very small quantity of g
Canadian balsam or Strasburg t
peculiar piquancy, or the prope
the palate,' regarded as a pr
and quality by the ignorant
imparted to the liquor by the
little caustic potassa. Sliced ho
piquancy as well as mellowne
paradise, cayenne pepper, and s
are also commonly added by frau

Although gin is always pr
large scale by distillation, it
made by the simple solution o
the flavouring ingredients in t
it is, of course, better for d
made in the former way, no salt
ployed. The gin produced
formulæ is that denominated
'UNSWEETENED GIN,' 'GROG G
the gin usually sold in the m
sweetened spirit, and hence is

the terms 'SWEETENED,' or
he generality of London gin-
the latter article, even when
erior, which it usually is, as
f sugar permits adulteration
to an enormous extent with
ity. Sweetened spirit cannot
for its strength, and is taken
at the strength which it is de-
s by the dealer. To ascertain
sweetened or not, a little may
in a spoon, over a hot coal or a
if it is pure, it will leave the
soiled; but if, on the contrary,
weetened, a small quantity of
or sugar, will be obtained, the
which may be easily recognised

of the casks and utensils em-
should be perfectly clean, and
ared, so as not to give colour;
irit acquires the palest coloured
is lessened, and if much coloured
d unsaleable. When gin has
much stained, the only remedy
l it; when it is only slightly
ddition of a few lbs. of acetic acid
pipe or butt, a spoonful or two
or a few drops to a decanterful,
decolour it, either at once or as
mixed with water to make grog.
LOMETRY, CASKS, DISTILLATION,
PIRITS, &c., and *below*.
al. This is gin sweetened with
ghtly aromatised.
od gin (22 u. p.), 90 galls; oil of
dr.; oils of cassia, nutmeg, and
ch, 2 drs.; oils of juniper, caraway,
r, of each, 3 drs.; essences of orris
damoms, of each, 5 fl. oz.; orange-
, 3 pints; lump sugar, 56 to 60 lbs.;
water, 4 galls. The essences are
2 quarts of spirit of wine, and
ally to the gin until the requisite
roduced, when the sugar (dissolved)
, along with a sufficient quantity
er, holding 4 oz. of alum in solu-
ke up 100 galls. When the whole
mixed, 2 oz. of salt of tartar, dis-
or 3 quarts of hot water, are added,
quor is again well rummaged up;
the cask is bunged up, and allowed
In a week, or less, it will have be-
nt, and may be either 'racked,' or
the same cask. *Product.* 100 galls.,
p.
tened. *Prep.* From unsweetened
), 95 galls.; lump sugar, 40 to 45 lbs.,
in clear water, 3 galls.; mix well,
down as above. *Product.* 100 galls.,
This, as well as the last, is usually
at 22 or 24 u. p., which is also
the gin has been further lowered
so as to be even 30 or 35 u. p.
, and above.
Syn. GINGER ROOT; ZINGIBERIS RADIX, ZINGIBER (B. P.), L. "The scraped and dried rhizome" (rootstock or underground stem) of "*Zingiber officinale.*"—(B. P.). Ginger is an aromatic stimulant and stomachic, very useful in flatulence and spasms of the stomach and bowels, and in loss of appetite and dyspepsia, arising from debility, or occurring in old or gouty subjects. A piece chewed an hour before dinner tends to provoke the appetite; as a masticatory, it often relieves toothache, relaxation of the uvula, tender gums, and paralytic affections of the tongue. Made into a paste with warm water, and spread on paper, it forms a useful and simple 'headache-plaster,' which frequently gives relief when applied to the forehead or temples. As a condiment and flavouring ingredient, it is perhaps one of the most wholesome of the aromatic kinds, and is less acrid than the peppers. *Dose.* 10 grs. to ½ teaspoonful, stirred up in any simple liquid.

Pur., &c. The best is that known in commerce as 'UNBLEACHED JAMAICA GINGER,' which is an uncoated pale variety, occurring in large, bold, fleshy pieces ('RACES'), which cut soft, bright, and pale-coloured. The inferior varieties occur in smaller pieces, and are darker-coloured, flinty, and shrivelled. The dealers frequently 'dress up' the common dark-coloured gingers by washing them in water, drying them, and then 'rouncing' them in a bag with a little calcined whiting or magnesia (WASHED GINGER); or they bleach them by dipping them into a solution of chloride of lime, or by exposing them to the fumes of burning sulphur (BLEACHED GINGER); or they dip them into a milk formed of quicklime or whiting and water (WHITE-WASHED GINGER). The last has a chalk-white surface, which cannot be mistaken for the natural one. POWDERED GINGER is with difficulty obtained pure and good. The common adulterants are wheat-flour, or East Indian arrow-root, and plantain meal. The first may be detected by the microscope, the others by the flavour and action of hot water. See LOZENGES, &c.

Preserved Ginger. *Syn.* CONDITUM ZINGIBERIS, L. An excellent stomachic sweatmeat or preserve. It is chiefly imported from the West Indies and China. See CANDYING, &c.

A Factitious Preserved Ginger is sometimes met with, prepared from the stalks of lettuce just going to seed, using a concentrated syrup, strongly flavoured with Jamaica ginger. See CANDY, &c.

GIN'GER BEER. See BEER.

GIN'GERBREAD. *Prep.* 1. (Dr. Colquhoun.) Flour, 1 lb.; carbonate of magnesia, ¼ oz.; mix; add, of treacle, ½ lb.; moist sugar, ¼ lb.; melted butter, 2 oz.; tartaric acid (dissolved in a little water), 1 dr.; make a stiff dough, then add of powdered ginger and cinnamon (cassia), of each, 1 dr.; grated nutmeg, 1 oz.; set it *aside for half* an hour or an hour before putting *it into the oven.* *Obs.* It should not be kept onger than two or three hours, at the utmost, before being baked.

2. Flour and treacle, of each, 1 lb.; butter, 1¼ oz.; carbonate of magnesia, 1 oz.; add spices (ginger, cinnamon, nutmeg, allspice, cayenne, corianders, &c.) to taste; mix as last. *Obs.* Fit for baking in from four to six hours.

3. Flour, 2 lbs.; carbonate of magnesia, ¼ oz.; mix; add, treacle, 1½ lb.; butter, 2 oz.; spice, q. s.; tartaric acid, ¼ oz.; mix quickly, and make it into forms. *Obs.* Ripe for the oven in half an hour to one hour.

4. Instead of tartaric acid in the last formula, use cream of tartar (dissolved in water), 2 oz. *Obs.* Ripens in 40 or 50 minutes.

5. Flour or fine pollard, 1 lb.; treacle, ¾ lb.; salt of tartar, ¼ oz., dissolved in water, q. s.; butter, 1 oz.; spices, to palate. *Obs.* Takes several days to ripen; sometimes a fortnight.

6. (Extemporaneous.)—*a.* From flour, 1½ lb.; moist sugar and treacle, of each, ½ lb.; butter, 2½ oz.; baker's salt (carbonate of ammonia), ½ oz., dissolved in cold water, q. s.; ginger, 3 drs.; nutmeg, 2 drs.; cassia, 1 dr.; cayenne pepper (best), ½ dr.

b. From flour, 6 lbs.; powered ginger, 2½ oz.; caraway seeds, 1 oz. (and other spices to palate); candied lemon and orange peels, of each, 2 oz.; moist sugar and melted butter, of each, ¼ lb.; treacle, 4 lbs.; volatile salt, 2 oz.; water, q. s.; mix as above. May be baked at once.

c. From Jones's patent flour, 2 lbs.; treacle, 1 lb.; moist sugar, ¾ lb.; butter, 2½ oz.; spice, q. s.; mix as quickly as possible, and bake it instantly. If the dough is expertly mixed up. the quality of the product is fully equal, if not superior, to that of any of the preceding formulæ.

Obs. Gingerbread is either rolled out into thin sheets and cut into cakes or nuts (GINGERBREAD NUTS) with the top of a wine-glass or canister, or is formed into thick cakes, which are baked in 'batches' (ordinary GINGERBREAD). Both varieties require a pretty brisk oven; the thinner kinds (nuts, &c.), especially, must be baked as crisp as possible, without being burnt. The varieties called LEMON GINGERBREAD, CARAWAY G., &c., have a perceptible predominance of these flavouring ingredients. The addition of a little alum, dissolved in water, makes the bread both lighter and crisper, and causes it to ripen quicker, but at the same time lessens its wholesomeness.

GIN'GER CAN'DY. See CANDYING.

GIN'GER DROPS. See DROPS (Confectionery).

GLAIRE. White of egg. See ALBUMEN and EGG.

GLAN'DERS. *Syn.* FARCINOMA, L. A contagious disease, generally confined to the horse, ass, and mule, but communicable to man, in whom it assumes a highly malignant and often fatal character. This disease appears under two forms—1. SIMPLE ACUTE GLANDERS, marked by copious discharge of foul mucous matter from the nostrils and adjacent parts;
and—2. FARCY, FARCIN, or FA
when it attacks the lymphati
either generally, producing a
pearance of the vessels, like m
(LEAD OR BUTTON FARCY), or l
takes the form of dropsical a
the legs (WATER FARCY).

Treat. Mr. Youatt conside
attempt the cure of glander
that farcy in its earlier sta
forms may be often successfull
the mercurials have been used
farcy; but they must be disc
as the mouth is sufficiently a
ness, loss of appetite, and like
produced." (Blaine.) Feedin
tirely on green food appears
mode of treatment in both
buttons are generally removed
a red-hot iron.

GLASS. *Syn.* VITRUM,
known substance is essentiall
silicates with an excess of
acid. It generally contains
potassa, soda, lime, baryta, ma
and lead, coloured by small p
manganese, cobalt, uranium, co
its usual form, it is brittle, tr
crystalline, insoluble, and fusibl
times exhibits other properties.

The manufacture of glass
highest beauty, and consideri
rative worthlessness of the mat
it is made, and the various pur
ful, ornamental, and scientific
subserves, it may be regarded
most important in the hist
tions. The principle of its pro
simple, although great skill
are necessary to ensure its exc
(commonly under the form of
with carbonate of potassa or of
lime or oxide of lead, until the
and combination takes place. A
melted mass becomes perfectly
from air-bubbles, when it is allow
it assumes the peculiar tenac
proper for working. The oper
is conducted in large crucible
fire-clay, which, in the case of
covered with a dome, at the to
opening at the side by which th
introduced, and the melted glas

The manufacture of glass is c
on the large scale, and the precis
proportions of the ingredients
glass-maker, must necessarily g
upon the nature of the raw mat
by his locality, or otherwise at
The attention of the manufactu
directed to the use of his mat
proportions as will furnish, in th
the proper quantities of the e
dients, as determined from the
sition of the best commercial
purity of the raw materials an

ons and quantities are proved
the excellence of the product;
of error (if any) may be at
d by carefully ascertaining the
ingredients employed, and the
the defective glass.
following formulæ exhibit the
the leading commercial glasses,
hemical analysis, together with
s of the raw materials used in
n.
ss. Sp. gr. 2·700 to 2·735.—
ion by analysis :—
8·55%; lime, 29·22%; mixed al-
umina, 6·01%; oxide of iron, 5·74%.

2%; baryta, 21·6%; soda, 26·1%;
and manganese, ·3%. Pale green;

terials used :—
sand, 20%; kelp, 8%; lixiviated
30%; fresh wood-ashes, 8%; pale
ullet' (broken glass), 18%. This
n mixture for coarse bottles, in
nce, and Germany.
ast add of black oxide of manga-
%. Has a rich yellowish colour;
nish-wine bottles.
d, 51%; lixiviated wood-ashes, 33%;
dried), 8%; common salt, 7½ %;
e, ¼ %; charcoal, q.s. Very pale

s sand (pale), 68½ %; potash (or its
lime, 23½ %; heavy spar, 2½ %; per-
ganese, 1½ %. This forms the cele-
-glass' of St. Etienne.
ASS, SPREAD WINDOW GLASS. Sp.

lysis :—
70%; lime, 13·30%; soda, 15·25%;
a (and loss), 1·75%.
ials used :—
sand, 50%; dried sulphate of soda.
al (in powder), 9%; 'cullet,' 41%;
manganese, a little. Pale.
sand, 60%; potashes (good), 24%;
t, 10%; nitre, 5%; white arsenic, 1%;
manganese, a little ($\frac{1}{10}$ to $\frac{1}{12}$ %); pale
will (10 to 30%). Very pale. This
pread' or 'sheet window-glass' in
e.
AL GLASS. Sp. gr. 2·390 to 2·396.—
nalysis —
, 72·80%; potassa, 16·80%; lime (with
alumina), 9·68%; magnesia, ·40%;
xide of manganese and iron (and loss),
is is the difficultly fusible 'Bohe-
-glass,' so valuable in chemical mani-

, 69·2%; potassa, 15·8%; soda, 3%; lime,
mina, 1·2%; magnesia, 2%; oxide of
oxide of manganese (and loss), ·6%.
emical glass (without lead). More
n the last.
rials used :—
(hyalin, in powder), 60%; calcined

purified pearlash, 30%; fresh-burnt lime (very pure), 9%; nitre (dried), ¾ %; arsenious acid or peroxide of manganese, ¼ %. Said to be the proportions used in the production of *a*, 1 (*above*).

2. (M. Peligot.) Quartz, 71½ %; carbonate of potassa (or its equiv., dry), 20%; quicklime, 8½ %; (manganese, a little). Said to be the formula for the hardest and least fusible 'Bohemian tube-glass.' It is very intractable and infusible, except at a very high temperature; but the addition of an exceedingly small quantity of boracic acid, borax, or arsenious acid, causes it to flow into a glass possessing great brilliancy and hardness, and capable of being wrought at the highest heat of the ordinary furnace.

CROWN GLASS, WHITE WINDOW-GLASS. Sp. gr. 2·486 to 2·488.—

a. By analysis :—

1. Silica, 62·8%; potassa, 22·1%; lime, 12·5%; alumina (with traces of oxide of iron and manganese), 2·6%. Crown-glass of Bohemia, according to Dumas. Very beautiful.

2. Silica, 72·5%; soda, 17·75%; lime, 9·75%. English crown-glass; excellent quality, but not so white as the last.

b. Materials used :—

1. Finest white siliceous sand, 64%; purified potashes (dry), 23%; lime, 12%; white arsenic, ¾ %; oxide of manganese, ¼ %. Said to be used in Bohemia.

2. (Schweigger.) Pure sand, 57%; dry sulphate of soda, 28½ %; quicklime, 11½ %; powdered charcoal, 3 or 4%. Corresponds to *a*, 2, *above* (nearly).

3. Pure sand, 40%; soda ash, 24%; lime, 5%; white 'cullet,' 31%. Rather superior to the last.

CRYSTAL, CRYSTAL GLASS. The 'crystal glass' of England is flint glass' of superior quality; that of Bohemia is noticed under TABLE GLASS.

FLINT GLASS, CRYSTAL. Sp. gr. 3·000 to 3·620.—

a. By analysis :—

1. (Berthier.) Silica, 59·19%; oxide of lead, 28·68%; potassa, 12·13%; oxides of iron and manganese, traces. Finest colourless English crystal.

2. (Brande; Faraday.) Silica, 52%; oxide of lead, 34%; potassa, 34%. Crystal.

3. (Faraday.) Silica, 44·30%; oxide of lead, 43·05%; potassa, 11·75%; alumina, ·50%; oxides of iron and manganese, ·12%; (loss 28%). Heaviest of three samples of flint glass examined.

b. Materials used :—

1. Finest Lynn-sand (calcined, sifted, and washed), 51%; litharge (purest), 28% (or red lead, 29%), refined pearlashes (calcined before being weighed), 16%; nitre (purified), 4¾ % arsenious acid and peroxide of manganese, of each, ⅛ %. Very fine crystal.

2. (M. Payen.) Fine sand, 46%; red lead, 31%; purified carbonate of potash, 23%. French *crystal.*

3. (Geddes.) White Lynn-sand, 51%; red

lead or litharge, 33%; refined pearlashes, 13%; nitre, 3%; a very little arsenious acid and peroxide of manganese. Ordinary English flint-glass. Crystal 'cullet' may be added at will to the above. This glass was originally prepared from powdered flints, a fact to which it owes its common name.

OPTICAL GLASS. 1. (Crown glass.) Purest siliceous sand, 55%; carbonate of soda (dry), 12%; chalk (dry), 11%; carbonate of baryta, 22%.

2. (Flint glass.)—

a. By analysis:—

Silica, 44·30%; oxide of lead, 43·05%; potassa, 11·75%. This is Guinand's 'dense optical glass.'

b. Materials used:—

1. Purest quartz, 42%; red lead (finest), 42%; purified potash, 14¼ %; purified nitre, 1¼ %. These are the proportions used for the last.

2. (Korner.) Finest quartz (reduced to powder, treated with hydrochloric acid, washed, and dried), 47½ %; red lead, 38¼ %; cream of tartar, 14½ %. The above are used by opticians in the construction of achromatic object-glasses.

PLATE GLASS. Sp. gr. 2·488 to 2·600.—

a. By analysis:—

1. (Dumas.) Silica, 75·9%; soda, 17·5%; lime, 3·8%; alumina, 2·8%. French mirror-glass.

2. (Mitscherlich.) Silica, 60%; potassa, 25%; lime, 12·5%; (loss, 2·5% ?). Finest Bohemian plate.

b. Materials used:—

1. Finest siliceous sand, 45%; dried carbonate of soda, 25%; lime, 5%; nitre (purified), 2%; plate-glass cullet, 23%; peroxide of manganese and cobalt azure, a very little. Ordinary English plate.

2. Whitish quartz sand, 60%; purified carbonate of soda (dried), 20%; lime (slaked by exposure to the air), 9%; plate-glass cullet, 11% (or more). Sometimes as much cullet as sand is used; but in all cases 1% to 1¼ % of its weight in carbonate of soda is added with it, besides that ordered in the formula, to compensate for loss of alkali by remelting. *Used* at the celebrated plate-glass works at Saint-Gobain, France. The product possesses an amount of excellence which British manufacturers have yet failed to equal.

TABLE GLASS, BOHEMIAN CRYSTAL. Sp. gr. 2·6 to 2·8.—

a. By analysis:—

1. (M. Berthier.) Silica, 71·7%; potassa, 12·7%; soda, 2·3%; lime, 10·3%; alumina, ·4%; oxides of iron and manganese (and loss), 2·6%. Very white, hard, and beautiful table glass.

2. (Dumas.) Silica, 70%; potassa, 20%; lime, 4%; alumina, 5%; oxide of iron, ·6%; peroxide of manganese, ·4%. A beautiful white wine-glass.

b. Materials used:—

1. Finest sand, 50%; purified potashes, 25%; chalk, 10%; nitre, 2%; crystal
manganese, a little (say $\frac{1}{16}$ %). U
land recently for table glass.

2. Quartz (hyalin, in powder)
fied potashes, 26%; slaked lim
sifted), 11%; manganese, a little
let, at will. *Used* in Bohemia.

3. (M. Perdonnet.) Powdered
carbonate of potassa, 33%; quickl
powder), 22%; nitre, 1%; and
quantity of arsenious acid and
manganese. Said to be the forn
Neuwelt for the glass *a*, 1 (*above*

Qual., &c. These are denoted
ness, transparency, homogeneit
and power of resisting the acti
air, light, and the stronger acids
The power of glass to resist t
menstrua is readily tried by ex
boiling oil of vitriol, and hot but
tion of caustic potassa. Neither
should cause the glass to lose its
or to become dim.

Swallowed glass. Glass and
in fragments and in powder, ha
ally been swallowed, with diffe
These bodies are insoluble in the
body, and, consequently, any inj
they may exert upon the system
are retained in it must entirely d
mechanical attrition or irritation
ment, we must administer an em
sist its action by thick mucilagi
and afterwards have recourse to ant
if necessary.

Anal.—a. A portion of the san
amination is heated to dull redne
suddenly thrown, whilst still hot,
of cold water. It is next dried,
to fine powder in an agate or ha
mortar.

b. 100 grs. of the prepared pow
roughly mixed with 200 grs. of p
hydrate, and the whole is exposed
silver or platinum crucible or c
perfect fusion takes place; when c
cible and its contents are boiled i
a pint of distilled water; nitric a
to the resulting solution, in exc
mixture, together with any sedim
porated to dryness, after which
gradually increased to 400° or 500
dry residuum is next reduced to
digested in water acidulated with
until exhausted of soluble matter;
ble portion is then carefully d
ignited, and weighed. The weigh
represents the per-centage of s
sample examined.

c. The mixed liquid and washin
next acidulated with nitric acid,
to a stream of sulphuretted hydr
if it produces a precipitate, is co
some time; the precipitate is col
very small filter, washed, and drie
with the precipitate next place

ong fuming nitric acid is cau-
drop by drop, until complete
place; after boiling the solu-
minutes, diluting with distilled
wing it to cool, it is precipitated
c acid, in excess; this precipi-
of lead) is washed, dried, slightly
orcelain crucible, and weighed.
n grains, multiplied by ·7369,
r-centage of oxide of lead or

red liquid from (*c*) is evaporated
d redissolved in water acidulated
loric acid, and treated with a
ammonium chloride, and after-
ammonia, in excess; the precipi-
and oxide of iron) is collected,
boiled in a solution of potassium
undissolved portion is collected
ashed with boiling water, ignited,
. This gives the per-centage of
iron.

uid filtered from the oxide of iron
amina (if any) in solution; a solu-
onate of ammonium is dropped in;
g precipitate is washed, dried, ig-
weighed. This gives the per-cent-
ina.

trate from the alumina and oxide
d), after being evaporated to dry-
issolved in a large quantity of dis-
r, and is treated with a solution of
(a solution of oxalate of ammonium
le when no baryta is present); the
is washed, dried, gently ignited,
ed. The weight of the resulting
of calcium, in grains, multiplied by
ives the per-centage of lime re-

filtrate from (*f*) is now mixed with
of potassium, in considerable excess,
l for a long time; the resulting pre-
f any) is then collected on a filter,
shed with hot water, dried, and ex-
a full red heat for some time (say 2
he residuum of the calcination is then
This furnishes the per-centage value
ple in magnesia.

filtrate from (*f*) is treated with di-
uric acid or the solution of a sul-
long as a precipitate falls; the pre-
(sulphate of barytium) is washed,
ntly ignited, and weighed. The
n grains, multiplied by ·6589, gives
entage of baryta in the sample.

ove may be varied by gently concen-
he liquid filtered from the precipi-
umina and oxide of iron (see *d*), and
ting it with dilute sulphuric acid;
d precipitate is exhausted by digestion
holding chloride of ammonium in so-
the undissolved residuum (sulphate of
) is washed, dried, and otherwise
s before; whilst the solution with
ngs is treated *with a solution of car-*
; the precipitate is car-

bonate of calcium, which is to be washed, &c., as directed under (*f*). The liquor, &c., filtered from the lime, is lastly tested for magnesia. (See *g*.)

i. A second 100 grs. of the powdered glass (see *a*) is mixed with 200 grs. of fluor spar, also in powder; the compound is placed in a platinum or leaden capsule, 500 grs. of strong sulphuric acid are added, and the whole cautiously stirred together with a silver stirrer or spoon, care being taken to avoid inhaling the fumes; the heat of a spirit lamp is next applied, and at first is kept at about 212° Fahr., but towards the conclusion of the process is raised to 300° Fahr., or even higher, and is continued for at least 2 hours, or until fumes entirely cease to be evolved; 5 or 6 fl. oz. of distilled water are next poured on the residuary mass, and, after thorough agitation, the whole is thrown on a filter, more water being at last poured on to wash out any remains of soluble matter; to the filtrate, carbonate of ammonium is added in excess, and after a time the earthy salts are removed by filtration; the filtered liquor is now evaporated to dryness, and ignited to dull redness for 2 or 3 minutes; the residuum (sulphate of potassium or sodium), or of both), after being weighed (the weight being carefully noted down), is redissolved in distilled water; a solution of chloride of barium is then added as long as it disturbs the liquor, and after a time the whole is again filtered; the filtrate is concentrated by evaporation, and solution of bichloride of platinum added in excess; the whole is now gently evaporated to dryness, mixed with alcohol, collected on a filter, carefully washed with weak alcohol, dried at a temperature under 212° Fahr., and weighed. The weight, in grains, multiplied by ·1940, gives the per-centage of potassa sought.

k. The weight of sulphate of potassium in the ignited residuum in (*i*) is calculated from that of the potassium last found (47 parts of the one being equal to 87 parts of the other), and this weight is deducted from the gross weight of the ignited sulphates; the remainder represents the quantity of sulphate of sodium present. The weight of the latter, in grains, multiplied by ·4367, gives the per-centage of pure soda required.

Concluding remarks. One of the chief points to which the skilful glass manufacturer directs his attention, is the quality of the materials. Great care is exercised in the selection of the sand for all the finer varieties of glass. The usual practice is to test it before using it, by exposing it to a very high temperature. The purest sand is that which is the whitest and freest from iron, and which, consequently, suffers the least alteration by this treatment. The alkalies (potash, soda) employed are purified by solution and crystallisation. The red lead and litharge must be pure and absolutely *free from oxide* of copper (a common contamination), which gives a green tint to the glass. The former, which is the most costly, is preferable to the finest crystal. Care must also be taken that the lime, clay, &c., are respectively of proper purity; and that the 'cullet,' or broken glass, which is almost always remelted with the other materials, is of proper quality, and of the same kind as that to which it is added. Potassa produces a better glass than soda, although the latter is now very generally employed, from its lower price. It is, however, quite inadmissible as an ingredient in the manufacture of the better class of crystal and plate glass, as, however pure it may be, it imparts to the product a slight greenish tinge more or less destructive of its beauty. When sulphate of soda (Glauber salt) is used as a source of soda, it is gently calcined to dissipate its water of crystallisation, and requires the addition of about 8% of charcoal to effect its reduction in the melting-pot. Common salt is also employed as a source of soda in the same manner. Sometimes native sulphide of lead (galena) is used to decompose the sulphate of soda, and in lieu of part of the oxide of lead; in which case about 5 parts of the sulphuret are taken for every 9 parts of the calcined sulphate.

To anticipate the results of his processes, and to carry out with certainty his various intentions, the glass manufacturer, perhaps more than any other person, requires the aid of science and experience. All his most essential operations depend on chemical principles. The products of his furnaces are not formed by the mere mechanical admixture of their several ingredients whilst in the state of fusion, but result from the play of delicate affinities which only act under certain conditions, and when the materials are presented to each other in uniform and definite proportions. Chemically speaking, the glasses are mixed supersilicates of the respective bases which enter into their composition (potassium, calcium, lead, &c.), and, like all other compounds which are formed by elective attraction, obey the common laws of combination, as developed by Dalton, and now so successfully applied in almost every department of industrial art. It has been shown by the most careful analysis, that in all the more valuable and beautiful commercial glasses the relative proportions of the materials are conformable to these laws, and that several of them are true atomic compounds, as perfect in this respect as the crystalline bodies commonly denominated salts. In some of the harder glasses of Bohemia the number of atoms or equivalents of silica are to each of the bases with which it is united, nearly as 5 to 1; whilst in a softer glass of German manufacture the proportions of the two are found to be as 4 to 1. The celebrated plate glass of St. Gobain is an atomic compound formed of 1 equivalent of trisilicate of soda united to 1 equivalent of trisilicate of lime, with a small per-centage of alumina in combination with silicic acid, also in atomic proportion. Glasses in which th
bear no atomic ratio to each ot
homogeneous, but always more o
and of unequal colour and refr
The absence of atomic proportio
substances entering into its compo
to be the only reason why the
plate and mirror glass is so grea
that of France and Germany, th
of the two becomes absurd. Th
of glass in the production of whi
manufacturer excels is flint gl
and here he certainly surpasses
rous competitors. The subjec
involved in difficulty, owing t
temperature necessary to effec
combination of the bases with t
varying with the character of t
and not being satisfactorily settl
tion or experience. The modify
of temperature is shown by the
lower the heat employed in th
smaller the quantity of silica
into the composition of the res
whilst at higher temperatures
base is dissipated in fumes, until
tions of base and acid result as a
produce a permanent atomic com
sponding to the temperature e
the heat is excessive or imprope
the loss of base produces an o
and an opaque, semi-vitrified ma
resembling 'Reaumur's porce
quality of the resulting glass dep
change being more or less comp
furnace yields the right temperat
duration of the exposure to its act
too short nor too prolonged, natu
for the unskilful conduct of the o
removes the stumbling blocks
ignorance had placed in the wa
attempts at excellence. The pro
their results are accidental; bu
obtained, the first are repeated wi
trouble or inquiry. This acco
same mixture of materials yieldin
different qualities at different t
different works, which the opera
himself with referring to the '
furnace.' The common plan in t
to regulate the proportions and
perience only, rather than by
practice combined. Now, althoug
has much yet to learn on the
stitution of the glasses, and alt
may not be able to ensure unvar
it is nevertheless certain that,
can afford much valuable assis
direction. Indeed, it has been as
of the leading Continental chem
gredients that will yield the prop
proportions in the melting pot ca
a bad glass, if exposed to such
as to permit of perfect combi
place.

It is found that those glasses

of alkali are acted on by water,
is in great excess they are
in that fluid. Ordinary flint
:d by long coction in water,
ss, which contains less alkali,
that trial. Glass which con-
erable quantity of lead is acted
:tted hydrogen. This is the
face of flint glass, under certain
ecoming opaque and iridescent.
f silica and alkali alone are
rmanently resisting the action
addition of lime or oxide of
be necessary to give them this
es that have a slight greenish
nay be often whitened, or ren-
, by exposure to light and air.
n the peroxidation of the iron,
:ide they owe their tint. Other
purpled by exposure, owing to
n of the manganese.

LOURS are communicated to glass
on of metallic oxides. Thus,
anese gives an amethyst; oxide
blue; oxide of iron, a brown;
copper, a green; oxide of gold,
oxide of copper, a ruby-red;
white; oxide of silver, a yellow,
bstances are either added to the
nts of the glass-pot, as in pre-
l gems, &c., or they are applied
er to the surface of the object,
n heated until fusion of the
ound occurs, as in enamelling and
ass.

:MED or FASHIONED into articles
es of blowing, casting, drawing,
reading. In the process of
ss the workman begins by col-
per quantity of glass in a soft,
t the end of his blowpipe (an
or six feet in length, terminated
piece of wood), which he then
lowing through, by which the
nded into a kind of flask, sus-
ving its form modified by the
ich it is held, and the velocity
ntinually given to the iron tube.
outhed vessel is to be made, an
l a 'pontil' or 'puntil,' is dipped
-pot and applied to the bottom
to which it thus serves as a
lowpipe being removed by the
a cold iron to the neck. The
re-heated, and the aperture en-
he vessel otherwise altered in
aid of a few simple tools until
t is then detached, and carried
ling oven,' where it undergoes
dual cooling during many hours.
bottles, flasks, carboys, and an
e variety of other articles, are
larger circular tables of CROWN-
de by a joint process of BLOWING
NG. The globular flask at first
nsferred from the blowpipe to the 'pontil,' is suddenly made to assume the form of a flat disc by the centrifugal force of the rapid rotatory movement given to the rod. SPREAD or BROAD GLASS is formed into sheets in a nearly similar manner. PLATE-GLASS is cast upon a flat metal table, and, after very careful annealing, is ground and polished by suitable machinery. TUBES are made by rapidly drawing out a hollow cylinder; and from these a great variety of useful small apparatus are constructed with the help of a lamp and blowpipe, or, still better, the bellows-table of the barometer-maker. GLASS BEADS are made from small tubes chopped into pieces of suitable lengths, which are stirred first in a mixture of sand and wood-ashes, in the cold, and afterwards in an iron pan over the fire until they assume a rounded form. SMALL TUBES are bent in the flame of a spirit lamp or gas-jet, and cut by a file, a scratch being made, and the two portions pulled or broken asunder in a way easily learned by a few trials. LARGE TUBES require the heat of a powerful blowpipe and lamp, or that of a furnace.

The following hints respecting the MANAGEMENT OF GLASS may prove useful to the inexperienced:—

ANNEALING. The process of annealing glass has been briefly referred to before. The extreme brittleness of imperfectly annealed wrought glass may generally be remedied on the small scale by immersing the articles in a bath of oil, or a concentrated solution of chloride of calcium, or common salt, and heating the whole gradually and cautiously to the boiling-point, and letting it again cool—the slower the better. By this treatment the glass will be enabled to bear any alternations of temperature between the two extremes to which it has been exposed.

BLOWING. By the ingenious art of GLASS-BLOWING and GLASS-DRAWING, as practised on the small scale, with a blowpipe lamp furnace, a variety of articles of ornament and utility may be made, their number being limited only by the ingenuity of the artist. The details of the various operations are, however, too lengthy to describe here.

CLEANING. Windows, looking-glasses, &c., may be quickly cleaned as follows:—Dip a slightly moistened rag or flannel into whiting, fuller's earth, wood-ashes, or rotten-stone, in impalpable powder, with which smear the glass, and wipe it off with a dry soft cloth. This does well when the surface is very dirty. In other cases, a little thumb blue, whiting, or chalk, in fine powder, tied up in muslin, may be dusted on the glass, which should then be cleaned off with chamois leather. This gives a fine polish.

CUTTING. Glass may be easily cut with a common well-hardened steel file, provided it be moistened with oil of turpentine, or plunged under water. It may also be perforated with *a common steel* brad-awl in the same way.

Glass vessels, as bottles and tubes, may be readily cut or shortened by placing a heated iron ring over the spot, or a piece of loose string or cotton dipped in oil of turpentine and set on fire, and immediately on the withdrawal of either applying cold water to the part. Glass vessels or tubes thus treated will generally crack round, and may be readily divided into two parts. In this manner a common Florence oil-flask may be converted into an evaporating dish and a funnel. By a little practice a crack may be led in almost any direction, or a new one made, by the point of a red-hot poker or a spring coal (an ignited crayon of prepared charcoal). The parts may then be separated by a little force or a smart rap, and the divided edges smoothed by the flame of a blowpipe, or by grinding them with powdered emery and water on a flat stone. In this way many broken articles in glass may be converted into others scarcely less useful.

Etching on glass has been already noticed under the head of Etching.

Grinding. This, on the large scale, like glass-cutting, forms a distinct occupation. On the small scale, glass may be roughed or ground by friction with powdered emery and water and a flat rubber of wood; care being taken that the article, if a plate, is laid on a perfectly flat surface, or, if hollow, is supported by a core of cement or plaster. The frosted appearance of ground glass is given to the panes of windows by gently dabbing the glass over with a piece of glazier's putty, stuck on the ends of the fingers. When applied with a light and even touch, the resemblance is considerable. Another method is to dab the glass over with thin white paint, or flour paste, by means of a brush, but the effect is much inferior to the above.

Packing glass. This subject will be considered under the general head of Packing.

Writing on glass may be performed by a piece of French chalk or crayons prepared for the purpose; or even with a common pen held nearly perpendicular. Indian ink, or, when the article will be exposed to damp, shell-lac ink or varnish, thickened with a little vermilion or lampblack, is best adapted to this purpose. Common ink is not sufficiently opaque.

Glass. This term was applied by the older chemists to various substances to which a vitreous appearance has been given by heat. Thus, we have 'glass of antimony,' 'glass of borax,' &c. It is now obsolete.

Glass, Pow'dered. *Syn.* Vitrum pulverisatum, L. *Prep.* Heat the glass red hot, throw it into cold water, dry, and powder it. *Used* to filter acids, and glued upon paper as a polishing powder; also to wear down corns upon the feet, after the feet have been well soaked, and dried.

Glass, Sol'uble. *Syn.* Water glass; Vitrum solubile, L. An impure alkaline silicate.

Prep. Silica, 1 part; carbonat
or of sodium, 2 parts; fused to

Carbonate of sodium (dry),
bonate of potassium (dry), 70 p
parts; as last. Soluble in boili
ing a fine, transparent, semi-el

Carbonate of potassium (d
powdered quartz (or sand free
alumina), 15 parts; charcoal,
together. Soluble in 5 or 6 t
of boiling water; and the fl
evaporated to dryness, yields
glass, permanent in the air.

Uses, &c. Soluble glass, i
been used to render textile f
bustible, as a varnish to preser
a vehicle in fresco-painting.
pound (silicate of sodium) is la
dung-substitute in calico-printi
manufacturers in place of th
merly in use. 10 or 12 ton
weekly in the district of So
The potassa compound (silicat
has been recommended as a re
concretions by Mr. Ure.—*Dose*
in 6 or 8 fl. oz. of water, twi
Dunging, Varnish, &c.

GLAZE. *Syn.* Glazing.
varnish applied to a surface to r
and glassy; any factitious, sl
The principal applications of
the following:—

Glaze. In *cookery*, is comm
to be gravy or clarified soup
gelatinises on cooling. It is u
of varnish to cover various dish
and may be spiced and flavour
the fancy of the cook. White
rally used as a glaze for pastry.

Glaze. In the *porcelain* an
manufacture, the vitreous coati
essential to the beauty and uti
ware. Glazes are either whi
The former, by the addition of
ingredients used for enamels,
into the latter.

a. For Earthenware:—

Prep. 1. (With lead.) W
53 parts; quartz or ground f
Cornish stone or felspar, 16 pa
glass, 5 parts; reduce the wh
pable powder. For common e

2. (Without lead.) Fine w
parts; purified potash, 8 parts
slaked lime, 2 parts; nitre, 4¾
heat the mixture in a blackle
reverberatory furnace, till the
a clear glass; let this cool, th
fine powder. For glazing pha
chemical vessels.

b. For Porcelain:—

Prep. (Rose.) Felspar, 27
parts; finest siliceous sand,
soda, and purest china clay (C

frit,'[1] powder, and add of cal-
parts.
IWARE:—
White felspar, 26 parts; soda,
, 2 parts; borax, 1 part; 'frit'
ist. Of the product take 13
, 50 parts; white lead, 40 parts;
; reduce the whole to powder
r painted stoneware.
amon salt, which is thrown into
rnace containing the ware. It
and decomposed by the joint
silica of the ware and of the
er always present; hydrochloric
are produced, the latter forming
ch fuses over the surface of the
res a thin but excellent glaze.
) STONEWARE' is now generally
ge chemical vessels, drain-pipes,

s must be reduced to very fine
use, they are ground with water
n paste or smooth cream, into
ticles, previously baked to the
biscuit,' are then dipped; they
ls exposed to a sufficient heat in
se the glaze. Another method of
m is to immerse the biscuit in
inute or so, and then to sprinkle
er over the moistened surface.

Syn. GLUTIN, VEGETABLE GE-
of the proximate principles of
, soluble in alcohol.

I. *Syn.* CRYSTALLIN. An albu-
existing in the crystalline lens of

WDER. *Prep.* 1. From Castile
y exposure to a warm dry atmo-
few days, and then reduced to
in a mortar. *Used* to clean

y, coloured with yellow ochre,
ish slate, q. s., and afterwards
a little powdered orris root or
! to colour gloves made of doe-
lar leather.

Syn. GANTS, Fr. Although
:ute a less costly article of dress
.t day than they did during the
the following information may
be sometimes found of value to
:—

ANING. 1. (KID GLOVES.)—*a.*
lightly, stretch them gently over
nd of appropriate size, and clean
sponge dipped in benzol, recently
'turpentine, or camphine; as soon
ry, withdraw them gently from
and suspend them in a current
few days, or until they cease to
cleaning liquid used. The smell
asses off very quickly. Heat
led. The cleaning liquid should be used liberally, and the first dirty portion should be sponged off with clean liquid.

b. By employing a saponaceous compound. See GANTEINE.

2. (DOE-SKIN and WASH-LEATHER GLOVES.)—*a.* Stretch them on a hand, or lay them flat on a table, and rub into them a mixture of finely powdered fuller's earth and alum; sweep it off with a brush, sprinkle them with a mixture of dry bran and whiting, and, lastly, dust them well off. This will not do if they are very dirty.

b. Wash them in lukewarm soft water, with a little Castile or curd soap, ox-gall, or bran tea, then stretch them on wooden hands, or pull them into shape without wringing them; next rub them with pipe-clay and yellow ochre, or umber, or a mixture of them in any required shade, made into a paste with ale or beer; let them dry gradually, and, when about half dry, rub them well, so as to smooth them and put them into shape; when they are dry, brush out the superfluous colour, cover them with paper, and smooth them with a warm (not hot) iron.

GLOVE DYEING. LEATHER GLOVES, if not greasy, may be dyed with any of the ordinary dyes by brushing the latter over the gloves stretched out smooth. The surface alone should be wetted, and a second or third coat may be given after the former one has become dry. When the last coat has become thoroughly dry, the superfluous colour should be well rubbed out, a smooth surface given them by rubbing them with a polished stick or piece of ivory, and the whole gone over with a sponge dipped in white of egg.

Gloves, Cosmetic. *Syn.* GANTS COSMETIQUES. These are mock kid or lambskin gloves rubbed over, on the inside, with the following composition:—Spermaceti cerate, 3 oz.; melt, add of balsam of Peru, ½ dr., stir for 5 minutes, and after a few minutes' repose, pour off the clear portion; to this add of oil of nutmeg, 15 drops; oil of cassia and essense of ambergris, of each, 6 drops; and stir until cold. *Used* by ladies to soften the hands and to prevent or cure chilblains and chaps. They are commonly worn all night in bed.

GLUCI'NUM. Gl. *Syn.* BERYL'LIUM. The metallic base of glucina. It was first obtained by Wöhler, in 1828, by a similar process to that adopted for aluminum, a metal which it greatly resembles. See ALUMINUM.

Gluci'num, Oxide of. *Syn.* GLUCINA, BERYLLIA. A pulverent white substance, found as silicate in the beryl, emerald, &c.

Prep. The beryl, in fine powder, 1 part; carbonate of potassium, 3 parts; expose the mixture to a strong red heat for half an hour, dissolve the calcined mass in hydrochloric acid, and evaporate the solution to dryness; redissolve the residuum in very dilute hydrochloric acid, and precipitate with pure ammonia; wash the precipitate well, digest it with a large *quantity of* carbonate of ammonium, filter, and boil the solution as long as carbonate of glucinum subsides. By exposure to a red heat the carbonic acid may be expelled, and the earth rendered anhydrous.

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[1] term for the half-fused mass formed by
r the materials of which glass is com-

Prop., &c. Glucina closely resembles alumina, from which, however, it is distinguished by its solubility when freshly precipitated in a cold solution of carbonate of ammonia, from which it is again thrown by boiling. Glucina is classed with the earths. The beryl contains 14% of this substance.

GLU'COSE. See SUGAR (Grape).

GLUE. *Syn.* GLUTEN, GLUTINUM, L.; COLLE, COLLE FORTE, Fr. Inspissated animal jelly, or gelatine, used as a cement.

Prep. Glue is principally prepared from the parings and waste-pieces of hides and skins, the refuse of tanneries, and the tendons and other offal of slaughter-houses. These substances, when intended for the glue-maker, are steeped for 14 or 15 days in milk of lime, then drained, and dried by exposure to the air. This constitutes what is termed the 'cleansing' or 'preparation,' and in this state the 'glue pieces,' as they are called, may be kept for a long time, and transported to any distance without suffering decomposition. Before conversion into glue, they are usually again steeped in weak milk of lime, and next well washed and exposed to the air for 24 to 30 hours. They are then placed in a copper boiler 2-3rds filled with water, and furnished with a perforated false bottom, to prevent them from burning, and as much is piled on as will fill the vessel and rest on the top of it. Heat is next applied, and the whole gently boiled or simmered together, until the liquor on cooling forms a firm gelatinous mass. The clear portion is then run off into another vessel, and a very small quantity of alum (dissolved) added; here it is kept hot by a water bath, and allowed to repose for some hours to deposit its impurities, after which it is run into the 'congealing boxes,' and placed in a cool situation. The next morning the cold gelatinous masses are turned out upon boards wetted with water, and are cut horizontally into thin cakes with a stretched piece of brass wire, and then into smaller cakes with a moistened flat knife. The latter are placed on nettings to dry. The dry cakes of glue are next dipped one by one into hot water, and slightly rubbed with a brush wetted with boiling water, to give them a gloss; they are, lastly, stove-dried for sale. This furnishes the palest and best glue.

As soon as the liquor of the first boiling has drained off, the undissolved portion of skins, &c., left in the copper is treated with fresh water, and the whole operation is repeated again and again, as long as any gelatinous matter is extracted. In this way a second and other inferior qualities of glue are obtained. The product from dried glue-pieces is about 50%.

Var. These chiefly depend on the care with which the process is conducted.
GLUE is prepared from the tendo
of neat cattle and horses. It is h
and soft; and grows moist in d
but it does not render felt brittle
varieties. FISH GLUE is made i
from various membranous and
fishes. PARCHMENT GLUE is p
shreds or shavings of parchment,
leather, &c., dissolved by boi
water. It is scentless, and near

Qual. The best glue is trans
colourless and tasteless, has ve
even when melted, and is extre
The presence of more than a tr
objectionable; an undue qua
easily detected by the usual
stongest glue is that obtained
more especially from the hides
cows. That obtained from the
lages, and tendons, is weaker.

Glue, Liq'uid. *Prep.* (Dum
water, 1 quart; best pale glue, 2
in a covered vessel by the heat o
cool, and add, gradually, of nitri
1·335), 7 oz.; when cold put it
Very strong, and does not gelati
'LIQUID GLUE' sold in the shops,
CEMENT.

Glue, Marine. *Prep.* 1. Indi
small), 1 part; coal tar or min
12 parts; digest in a covered ve
and agitation, and when the sol
plete, add of powdered shell-lac,
tinue the heat and stirring until
faction has taken place, and p
mass, whilst still hot, on slab
metal or stone, so as to form thin
use, it is heated to its melting-
250° Fahr.) in an iron vessel, a
the liquid state with a brush.
ship-building, &c.

2. Caoutchouc, 15 to 20 grs.
2 fl. oz.; dissolve, and add of pow
¼ oz. It must be kept well co
cool place, to prevent loss by
Used for small, fine work.

Glue, Port'able. *Syn.* BAN
MOUTH G., INDIAN G.; COLLE À
Prep. From the best pale glue,
q. s.; dissolve in a double glue-
bath, add of pale-brown sugar,
the heat until the mixture is c
pour it into moulds; or pour it
slab. and when cold, cut it into
and dry them in the air. This
useful to draughtsmen, archite
dissolves almost immediately in
fastens paper, &c., without t
damping, and may be softened f
poses with the tongue. When g
is not required, 4 oz. more of
used.

GLU'TEN, *Syn.* GLUTIN. A
stance found in the grain of
composed of true vegetable fib

n. It is prepared by wash-
the flour of wheat or rye in
until all starchy matter is
ste may be conveniently en-
ine linen during the washing.
gluten is believed to be emi-
It is the presence of gluten
hat imparts to it its viscidity
confers upon it its peculiar
manufacture of MACARONI,
similar pastes. The supe-
n over other bread depends
tenacity of its dough, which
entation is puffed up by the
acid, and retained in its vesi-
s to form a light loaf.
ish coloured, and extensible
moist, like caoutchouc. It
mixed with guaiacum resin.
Prep. 1. From wheat flour
deprived of about 2-3rds of
hing it with water.
n flour. Recommended in dia-

ate. (Gentile's.) A mixture
en flour. As a nutritious and
in diabetes.
Prep. 1. From the waste
rch works, washed, dried, and

From the last, mixed with
eight of wheat flour.
$C_3H_8O_3$. *Syn.* GLYCERINE,
DE OF GLYCERYL; GLYCERI-
weet syrupy liquid formed
ification of oils and fats.
re oil (or other suitable oil),
d, and water, are heated toge-
insoluble soap of lead (lead
ed. The glycerin remains in
uid. As this crude solution of
uced in great quantities in the
lead plaster, the operative che-
purify it. This may be done

d washings from lead plaster
her, filtered, and submitted to
ream of sulphuretted hydrogen,
the lead; the supernatant
ted from the precipitate, fil-
orated to the consistence of a
ter bath. To render it quite
ed with water, decoloured with
charcoal, filtered, and again
he consistence of a thin syrup,
s further evaporated in vacuo,
ric acid, until it acquires the

re-Perrin.) From the sweet
earine works (a product of the
saponification). The quantity
in the sample is first deter-
s of oxalic acid, and the pro-
huric acid necessary for its sa-
re calculated and added; the
*then concentrated in a tinned-*copper vessel, evaporation being promoted by brisk agitation, until the sp. gr. sinks to 10° Baumé; it is next cooled and filtered, and accurately neutralised (if it is required) with carbonate of potassa, after which it is evaporated to the sp. gr. 24° Baumé; on cooling, it deposits gelatinous sulphate of potassa; the whole is now filtered, the deposit on the filter washed with a little very weak spirit and water, the filtrate and washings mixed together, and evaporated, as before, with agitation, until the sp. gr. 28° Baumé, whilst hot (36° cold), is attained, when the whole is allowed to cool; the clear liquid is, lastly, decanted and filtered. In this state it has an amber colour, but may be rendered colourless and odourless by rediluting it with water, treating it with animal charcoal, filtering, and again evaporating to a proper consistence.

3. By saponifying olive oil with caustic alkali, decomposing the resulting soap with dilute sulphuric or tartaric acid, evaporating the aqueous portion to dryness (nearly), dissolving out the glycerine with cold rectified spirit, and filtering and evaporating the solution as before.

4. The residuary liquor of a soap manufactory is evaporated, and treated with alcohol to dissolve out the glycerin. The spirit is then evaporated off, the glycerin diluted with water, and finally boiled repeatedly with animal charcoal until all colour and odour are removed.

Obs. The products of the above processes are nearly pure, but that of Price's patent process, described below, is to be preferred to any of them.

5. (Commercial.) From sweet stearin-liquor, by precipitating the lime by a stream of carbonic acid gas, or by a solution of carbonate of soda, carefully avoiding adding the latter in excess; the liquor is then boiled a little, filtered, evaporated to a syrupy consistence, and again filtered. This is the common glycerin of the shops. It may be further purified as above.

6. (PRICE'S GLYCERIN—Patent dated 1854.) Superheated steam of from 550° to 600° Fahr. is introduced into a distillatory apparatus containing palm oil or other fatty body. The action of the steam effects the decomposition of the fat, and glycerin and the fatty acids distil over together, but no longer in combination. In the receiver the condensed glycerin, from its higher specific gravity, sinks below the fatty acids. Sufficient steam must be supplied, and the temperature nicely regulated. The glycerin is concentrated by evaporation, and if discoloured, it is redistilled. It is usually prepared with sp. gr. 1·24, and then contains 94% of anhydrous glycerin. It can, however, be concentrated to sp. gr. 1·26 when it contains 98%.

Prop. Pure glycerin is a colourless, odourless, uncrystallisable liquid, sweet to the taste, *and of* a syrupy consistence; it mixes with water in all proportions; it is unctuous and emollient, and softens bodies, like oil, but without greasing them; it does not evaporate or change in the air at ordinary temperatures, and is not susceptible of rancidity or spontaneous fermentation; mixed with yeast and kept in a warm place, it is gradually converted into propionic acid; a strong heat decomposes it, with the production of acrolein; it is neutral to test-paper, and possesses neither basic nor acid properties; it is easily charged with the aroma of the essential oils, and may be combined with soap, and many other substances, without undergoing change. Sp. gr., 1·27 (see *above*).

Uses, &c. Glycerin is extensively employed as an excipient for medicines (see GLYCEROLES), also, either alone, or in lotions, baths, &c., as a soothing emollient, and is added to poultices and dressings, instead of oil, to prevent their hardening. Diluted with water, it often succeeds in allaying itching and irritation of the skin when all other means fail. As a cosmetic, either made into a lotion or added to soap (glycerin soap), or used in small quantities along with the water employed in washing, it imparts a healthy clearness and a sensation of softness and coolness to the skin, which is very agreeable and refreshing. It is the best remedy known for chapped nipples, hands, lips, &c.; all of which may be prevented by its use as an article of the toilet. Glycerin is sometimes used as a sweetening agent, as a substitute for syrup.

Glycerin Cream for Chilblains. Equal parts of glycerin, soft soap, and cherry-laurel water, mixed together.

Glycerin Cream with Camphor. Glycerin, 2 parts; camphor, 1 part; rectified spirit, 1 part. Mix. For chilblains.

Glycerin Ointment. Glycerin, 8 parts; spermaceti, 4 parts; white wax, 1 part; oil of almonds (fixed), 16 parts. Add the glycerin to the melted ingredients, and stir briskly till cold. For chaps and excoriations.

GLYCEROLE. A pharmaceutical preparation, in which glycerin is employed as the excipient.

Glycerole of Borax. (B. P.) *Syn.* GLYCERINUM BORACIS, L. 1 of borax in 4½ of glycerin.

Glycerole of Carbolic Acid. (B. P.) *Syn.* GLYCERINUM ACIDI CARBOLICI, L. 1 of acid in 4½ of glycerin.

Glycerole of Gallic Acid. (B. P.) *Syn.* GLYCERINUM ACIDI GALLICI, L. 1 of acid in 4½ of glycerin.

Glycerole of Starch. (B. P.) *Syn.* GLYCERINUM AMYLI, L. 1 of starch in 8½ of glycerin.

Glycerole of Tannic Acid. (B. P.) *Syn.* GLYCERINUM ACIDI TANNICI, L. 1 of acid in 4½ of glycerin.

GLYCYR'RHIZIN. *Syn.* LIQUORICE SUGAR. An uncrystallisable variety of sugar obtained from the root of common liquorice (*Glycyrrhiza glabra*). It is yellow, transparent, soluble in both water and alcohol, and is not susceptible of the vinous fermentation.

GLYSTER. See ENEMA.

GNATS and MOS'QUITOES. Smo
fumes of any kind will drive a
sects. If you only burn a pie
paper in an enclosed space wh
they soon after 'settle,' and app
so stupefied as to remain inac
time after. In those parts of th
where mosquitoes abound, toba
commonly had recourse to in-do
fires made of brush-wood or un
of-doors. Old travellers, when
bivouac during the season in wh
troublesome, are very careful to
the 'lee' of these fires.

GOITRE. *Syn.* DERBYSHIRE
CHOCELE, TRACHEOCELE; HER
ALIS, L. A tumour on the for
neck. It sometimes occurs in D
is endemic in the Alps and sever
tainous districts. Iodine and the i
to be the only substances capab
even arresting the progress of th

GOLD. Au. *Syn.* AURUM; O
Ger. Gold is the most valuable
the longest known of all the m
the remotest period it has been
its beauty and permanence, and h
as the standard measure of value
civilised nations. An account o
gold in the arts, and its influence
all ages, as a symbol of wealth a
of ornament and utility, would
whole history of mankind. At th
it alike contributes to the conve
forts, and luxuries of life, as ofte
baser passions of the human heart
the cause of benevolence and virt

Gold is found almost invari
metallic state. It occurs as gold
sands of various rivers, and in th
of auriferous districts, from bot
is obtained by the simple proces
Traces of it are constantly foun
and other pyrites of the more
Sometimes it occurs beautifully
the cubic form, associated with
of iron, and other substances, in
In the gold fields of California
lumps of nearly pure gold have b
in abundance during the last f
the former country a mass of gol
pounds was found, whilst in our
one weighing 106 pounds was
quartz rock, near Bathurst. T
tained upwards of $91\frac{0}{0}$ of pure go
$8\frac{1}{2}\,\frac{0}{0}$ of silver; being as pure as the
reign, or, in trade language, '22

Prep. This consists merely in
of the gold and its subsequen
Formerly, the auriferous sulph
poor, were first roasted, the
'mattes' and again roasted; th
melted with lead, and the alloy
was refined by cupellation. W
were very rich, the preliminar

were omitted, and the alloy of
formed. This method (by fusion)
ıwer well with auriferous copper
:es very poor in gold. At the
: the method of amalgamation
r followed. When a 'vein-stone'
ought for gold, it is reduced to
the small scale by hand, on the
n stamping mills), and is shaken
e apparatus with water and mer-
ıalgam of gold is formed, which
ırated from the mixture, and its
moved by distillation. The gold
into 'ingots.'

Gold obtained by the first method
ains a little copper and silver, and
tin or iron. Tin may be removed
little corrosive sublimate or nitre
melted in a crucible. The process
uation commonly leaves no other
silver. This metal is removed
he 'dry way,' by fusing the gold
ır or sulphide of antimony; or in
ıy,' by 'quartation' and 'parting.'
l Mint, "when gold ingots contain
uantity of silver" (say $2\frac{0}{0}$ or $3\frac{0}{0}$),
: leaving it, as formerly, to con-
ırt of the standard alloy, it pays to
and to substitute copper in its
get the silver out of the said
y are melted with about 3 parts of
resulting alloy is granulated and
sulphuric acid—the gold remains
and all the silver is dissolved and
ıto sulphate. . . The sulphate
:hen decomposed by the immersion
lates; the silver is precipitated in
'stalline powder, washed, pressed
and melted, and so affords PURE
ıich is afterwards made standard
it with copper, and is used for
The resulting sulphate of copper
ts in the solution) is then crys-
l sold." (Brande.) "By first ex-
ıe gold with nitric acid, and then
ı sulphuric acid, some two or three
part of silver which escaped the
ıe nitric acid is dissolved out, and
.re gold is obtained." (Ure.)

eign invention, patented in 1851
E. Newton, the operations of 'se-
d 'refining' are conducted by one
he argentiferous substance, whether
of ore or bullion, is reduced to a
or spongy state, by fusion along
r some other metal cheaper than
:he zinc is subsequently removed,
g the resulting granulated, lami-
ılverulent alloy, in dilute sulphuri-
r acid. The zinc, &c., is recovered
l means. This process, carefully
roduces metal of great ductility and
aining $99\frac{5}{8}$ to $99\frac{1}{4}$ $\frac{0}{0}$ of pure gold.

'g ***pure gold*** is obtained by dis-
metal in nitro-hydrochloric acid,
ation of protosulphate of iron, and

collecting and washing the precipitate. In this state it is a brown powder, which acquires a metallic lustre by friction or heat.

Prop. The most marked properties of gold are its rich yellow colour, its ductility, malleability, insolubility in all menstrua except 'aqua regia' (nitro-hydrochloric acid), aqueous chlorine, and hydrofluoric acid, and its very slight affinity for oxygen. It melts at a bright red heat (2016° Fahr.,—Daniell), and the fused metal has a brilliant green colour. It forms compounds with chlorine, iodine, oxygen, sulphur, &c. Sp. gr. of native gold, 13·3 to 17·7; of pure gold, 19·3 (average); its greatest density is 19·5.

Tests. Metallic gold is characterised by its yellow colour, insolubility in nitric acid, and its ready solubility in aqua regia, forming a rich yellow or amber-coloured liquid, which stains the skin purple. Solutions of gold exhibit the following reactions:—Protosulphate of iron gives a brown precipitate, which acquires a metallic lustre when rubbed;—Protochloride of tin (preferably containing a little perchloride) gives a violet, purple, or blackish precipitate, insoluble in hydrochloric acid;—Sulphuretted hydrogen and hydrosulphide, of ammonia give a black precipitate, insoluble in simple acids;—Ammonia gives a reddish-yellow precipitate ('fulminating gold'), with tolerably concentrated solutions, either at once or on boiling the liquid;—Liquor of potassa gives a reddish-yellow precipitate with neutral solutions of gold, insoluble in excess.

Estim. 1. In the dry way;—

The quantity of gold in an ALLOY is usually estimated by 'assaying' the sample. Before proceeding to the assay, it is necessary to form some estimate of the quantity of other metals (copper or silver, or both) in the specimen to be examined, in order to employ the proper proportion of lead in the 'cupellation.' The experienced assayer commonly does this by the 'assay of the touch,' and, in certain cases, by a rough preliminary assay. The quantity of lead employed may be about 16 times the weight of the copper present in the sample, and when the alloy contains silver an additional allowance of lead, equal to $\frac{1}{10}$th of its weight, is made on that account. When no silver is present, or it is not required to be estimated, a much larger proportion of lead may be employed. The weight taken for the assay ('assay pound') is usually 12 or 6 grs. The alloy and dose of lead being accurately weighed and separately wrapped in small pieces of paper, the assay may be at once proceeded with.

α. CUPELLATION. This operation, the most important of the whole, has been already described. Unlike silver, gold will bear the highest heat of the furnace without 'vegetating,' 'fuming,' or being absorbed by the cupel. The loss of weight gives the amount of copper in the alloy.

β. QUARTATION. The cupelled sample is

long as a precipitate forms, carefully avoiding any excess; wash, and dry the precipitate.

Prop., Uses, &c. This salt is a pale-yellow powder, insoluble in water, but very soluble in a solution of cyanide of potassium, forming the double cyanide of gold and potassium so largely used in the electrotype process. Cyanide of gold is employed to a certain extent in medicine.—*Dose.* $\frac{1}{12}$ to $\frac{1}{18}$ gr., made into a pill, in the usual cases in which gold is administered. The first formula is essentially similar to that of the French Codex.

Gold, Extraction of, by Sodium Amalgam. (Crookes' Method, Patented.) In the extraction of gold by amalgamation serious difficulties are often occurring through the 'flouring' or 'sickening' of the mercury employed, and the prevention of the amalgamation by a coating of tarnish on the gold. So much is this the case that losses of from 30 to 60 per cent. of the gold are usually incurred, and, in many cases, a still more serious loss of mercury.

When certain minerals, as tellurium compounds, pyrites, &c., occur in the gold ore, the mercury is apt, on trituration, to become subdivided into excessively minute globules, which, owing to their tarnished condition, refuse to unite, and are consequently washed away, it being almost impossible to separate them from the heavier portions of the ore. This is technically called 'flouring,' 'granulating,' &c. Besides this, certain of these minerals affect the mercury in another way, that is, by 'sickening' it, or causing it to lose its bright surface and fluidity, and prevents its amalgamating with the gold. Besides the inconvenience and loss thus caused, a further loss of gold takes place from the inability of the ordinary mercury to touch or amalgamate tarnished

[illegible]

Gold, Iodide of. AuI_3. *Syn.* A
TRI-IODIDE OF GOLD, GOLD TERI
IODUM. *Prep.* Add a solution
of gold to one of iodide of potassi
sulting precipitate is at first re
agitation, a soluble double iodide b
subsequently the iodide of gold is
leaving the supernatant liquor fre

Prop., Uses, &c. A dark-gr
easily soluble in hydriodic acid.
sionally employed as a medicin
other preparations of gold, is of
character.—*Dose.* About $\frac{1}{16}$ of a

Gold, Oxides of:—

1. **Monoxide.** Au_2O. *Syn.* AU
PROTOXIDE OF GOLD. *Prep.* Form
ing the aurous chloride with stro
hydrate. Green powder, somewha
potassium hydrate solution, and re
posing into metallic gold and auri

2. **Trioxide.** Au_2O_3. *Syn.* A
OXIDE OF GOLD, PEROXIDE OF G
ACID, AURI OXIDUM. *Prep.* Mag
parts; auric chloride, 1 part; wat
mix, boil, and wash the precipitate
dilute nitric acid, and again wit
must be dried in the shade.

Reddish-yellow powder, easily
by heat; readily soluble in hydr
hydrobromic acids and strong nit
insoluble in water and the other a
unstable salts with the alkalies.

Uses, &c. Trioxide of gold ha
in scrofula, &c., in doses of $\frac{1}{12}$ t
gr., in scrofula, syphilis, &c., mad
with extract of mezereon.

Gold, Ammoni'uret of*. *Syn.*
AMMONIA, BERTHOLLET'S FULMIN

м, L. *Prep.* Transmit a current
ed hydrogen gas through a solution
: of gold in water; or add hydro-
ammonia to the same solution;
recipitate, wash it with cold dis-
and dry it in the shade.

TER'GENT. *Prep.* (Upton.) Take
oz.; sprinkle it with a little hot
ke it, then gradually add boiling
at, so as to form a milk. Next
rlash, 2 oz., in boiling water, 1½
the two solutions, cover up the
ite occasionally for an hour, allow
decant the clear, put it into flat
ttles, and well cork them down.
:lean gilding, &c., either alone or
water. It is applied with a soft
then washed off with clean water.
tially a weak solution of potassa,
e extemporaneously prepared by
ation of potassa (Ph. L.) with about
volume of water.

ELLS. Gold leaf or powdered gold
with gum-water, and spread upon
of shells. *Used* by artists.

E. *Syn.* GILDING SIZE, GILDER'S
COLOUR. *Prep.* 1. (OIL SIZE.)
boiled oil thickened with yellow
lcined red ochre, and carefully re-
e utmost smoothness by grinding.
ed with oil of turpentine. Im-
ge. *Used* for oil gilding.
E SIZE.) Parchment or isinglass
with finely ground yellow ochre.
nished or distemper gilding.

AT'ER'S SKIN is prepared from
al membrane of the cæcum of the
sed to separate the leaves of gold
: the hammer, as a nearly invisible
ressing for cuts, as a fabric for
:, &c.

TAL. See BELL METAL.

ETRY. The art of measuring the
rstals, by means of a GONIOMETER;
portant matter in *chemistry* and
The only accurate and simple
of this kind is the REFLECTING
invented by Dr. Wollaston.
using this instrument is readily
a few trials.

This bird, the *Anser domesticus*,
ite article of food almost every-
may fairly claim a similar position
ultry to that occupied by "good
nong joints of meat. The vulgar
casionally heard to its prejudice
directed against the cook rather
rd, as it is only when it is unskil-
l and too highly seasoned that it
agree with that "irascible mem-
interior," a delicate or overloaded
Undue susceptibility in that quarter
ver, be generally allayed by an
the shape of a little '*eau de vie*,'
nce or gravy. Formerly, *almost*
virtues were attributed to this bird. Its flesh was said to promote longevity, to cure hydrophobia, and to be aphrodisiac. The fat (GOOSE GREASE; ADEPS ANSERIS), mixed with honey, was supposed to be "good against the bitings of a mad dog." At the present day it is occasionally used in clysters, and, when scented, as a pommade to make the hair grow, for which purpose it is said to be superior to bear's grease. In quantity, it is an emetic of very easy action. The large feathers of the wings (quills) are used for writing. The small feathers form the common stuffing of our beds.

GOOSE'BERRY. The fruit or berry of *Ribes grossularia.* Unripe fruit, cold and acidulous; ripe fruit, wholesome and slightly laxative; but the seeds and skins should not be eaten, as they are very indigestible; the juice of the green fruit is made into wine (ENGLISH CHAMPAGNE); the seeds, washed and roasted, were formerly used as a substitute for coffee (GOOSEBERRY COFFEE). Gooseberries are preserved by simply bottling them, and keeping them in a very cold place. See CHEESE, FOOL, FRUIT, &c.

GOULARD. *Syn.* GOULARD'S EXTRACT. See SOLUTION OF DIACETATE OF LEAD.

GOUT. *Syn.* ARTHRITIS, L. A painful disease that chiefly attacks the male sex, particularly those of a corpulent habit and robust frame. Persons who live temperately and take much exercise are seldom troubled with gout. Indolence, inactivity, luxurious habits of life, and free living, are the chief exciting causes of this disease; but excessive study, grief, watchfulness, exposure to cold, and the too free use of acidulous liquors, also occasionally bring it on. In some persons it is an hereditary disease.

Symp. Gout is generally preceded by unusual chilliness of the feet and legs, and a numbness or a sensation of prickling along the lower extremities; the appetite fails, flatulency, indigestion, torpor, and languor ensue, and extreme lassitude and fatigue follow the least bodily exercise; the bowels become costive, and the urine pallid. The fits usually come on in the night; the patient is awakened by the severity of the pain, generally in the first joint of the great toe, or occasionally in the heel, whole foot, or calf of the leg. The pain resembles that of a dislocated joint, accompanied by a sensation resembling the effusion of cold water; the pain increases, rigors and febrile symptoms ensue, accompanied with local throbbing and inflammation. Sometimes both feet and legs are attacked; at others, only one. Towards morning the patient generally falls asleep, and sinks into a state of copious perspiration, from which he awakes comparatively recovered. This constitutes what is called a 'fit of gout.' These fits or paroxysms are apt to return at intervals, commonly every evening, with more or less violence; and when frequent, the disease usually extends its action, the joints become affected, and concretions of a chalky nature (chalk stones, gout stones) are formed upon them, and they become stiff and nearly immovable.

Treat. A plain or vegetable diet, moderate exercise, and the use of warm laxatives, gentle tonics, diaphoretics, and diuretics, are among the best preventives. The moderate use of alkaline remedies, as potassa and magnesia, has also been recommended. To relieve the fit of gout, or to check it at its commencement, the affusion of cold water will be often found effective. The use of the '*eau médicinale,*' or the '*vinum colchici*' of the Pharmacopœia, may also be had recourse to; a due dose of which taken at bedtime will frequently carry off the paroxysm, and nearly always mitigate the symptoms. The effect of the above remedies do not greatly differ from each other. The action of both medicines is accompanied with great languor, and a deadly nausea or sickness, which terminates in vomiting or a discharge from the bowels, or both. These symptoms have often reached an alarming extent, and in some constitutions follow even a moderate dose. This method of cure should not, therefore, be unadvisedly and incautiously adopted.

Another remedy which has been recommended for gout is lemon juice, but experience has proved that this agent is not to be depended on. The *dose* proposed by Dr. O. Rees, who originated this treatment, was 2 or 3 fl. oz., twice or thrice a day.

To ensure the efficacy of lemon juice, it must be expressed from the fruit into the glass shortly before being taken. That purchased at the shops is generally stale and disagreeable, and is often worse than useless. In some cases it is advisable to take the juice undiluted, but the more common practice is to mix it with about an equal quantity of water. See RHEUMATISM, COLCHICUM, DRAUGHT (Antiarthritic), LEMON JUICE, VINEGAR OF COLCHICUM, WINE OF COLCHICUM, &c.

Gout Cor'dial. *Prep.* Rhubarb, senna, coriander seed, sweet-fennel seed, and cochineal, of each, 2 oz.; liquorice root and saffron, of each, 1 oz.; raisins, 2½ lbs.; rectified spirit of wine, 2 galls.; digest for 14 days, press, and filter. *Used* in gout and rheumatism. Aromatic and slightly laxative. *Dose.* 1 to 3 table-spoonfuls.

Gout Med'icine. (Duncan's.) A mixture of wine of colchicum, wine of opium, and tincture of saffron.

Gout Rem'edy. (Alexander's.) According to Dr. Paris, this contains—aniseed, cumin seed, ginger, hermodactyls, pepper, and scammony.

Gout Specif'ic. (Murray's.) A mixture of iodide of potassium, sulphate of magnesia, and wine of colchicum, disguised with an aromatic tincture.

GOUTTES AMERES. [Fr.] See DROPS (Bitter).

GRAD'UATOR. See VINEGAR.

GRAFT'ING COM'POST. Clay tempered with water, to which a little linseed oil is sometimes added. *Used* to cov
formed by the scion and stock in

GRAINS OF PAR'ADISE. S
GRAINS, MALAGUETTA PEPPER.
the *Ammomum melaguetta.* Grai
are hot, acrid, and aromatic, a
properties similar to the other
some parts of the world they
condiment. They are princip
in these countries to impart a
to wine, beer, spirits, and vinega

GRANIL'LA. A small inferi
cochineal (which *see*).

GRANULA'TION. The act
forming, or breaking into, gr
masses.

The granulation of MEDICIN
years received considerable a
both foreign and British pharm
France, granulated powders (POU
LÉES) are coming into general
of impalpable powders, the most
all forms of medicine. The F
consists in enveloping the part
cines in syrup by means of heat
stirring. Mr. Banner, of Liver
introduced a method of granula
far preferable to that of the Fr
ceutists. The powder to be
placed in a mortar. and mucilage
is gradually added until a cru
made; this is then rubbed th
sieve (about 12 meshes to the i
granules produced are spread out
left to dry spontaneously, or they
a copper pan, and kept in constan
a stove until dry; when perfectl
placed in a mortar, and sufficien
strong tincture of tolu (3 drs. to
to them, until by constant sti
appear glossy and shining; tl
dried again by a gentle heat,
constant motion. The granules
keep well, are tasteless, and ar
elegant and agreeable preparation
ordinary powders. Many saline
granulated by the simple process
the salt in water. and evaporati
with constant stirring.

METALS are granulated (redu
grains, or coarse powder) by pou
the melted state, into water. I
they are allowed to run throug
a species of colander or siev
minute division; and in order
drops spherical, they are allowe
a sufficient height to permit
quiring the solid state before
water. Lead shot is made in th
towers are often upwards of 100
See COPPER, GUNPOWDER, POWI

GRAPES. *Syn.* UVÆ, L.
Vitis vinifera, or the common
Ripe grapes are cooling and anti
large quantities diuretic and la
are very useful in bilious affec

ll febrile, putrid, and inflam-
nts. The skin and seed, which
should be rejected. "Grapes
a large quantity of sugar are,
ut the husks, the safest and
of summer fruits." (Cullen.)
of pulmonary affections, who
er in Switzerland, may try the
rse of grapes, '*cure de raisins*,'
in high estimation in several
ntinent." (Sir J. Clark.)
unches, are preserved by wrap-
silver paper, and packing them
Each bunch is suspended by the
fingers of one hand, whilst the
l round it with the other; the
sionally gently shaken as the
king proceeds. Some paper is
the top of the jar, the mouth or
is, lastly, tied firmly over with
clude the air and moisture. See

. See PLUMBAGO.
A collection of small pebbles
ed with sand or clay, or both.
rden walks is chosen for its fine
ding properties. The gravel of
nd Wimbledon is esteemed the
orld.—Gravel walks, when once
y be rendered nearly equal to
uring over them tar or a mixture
ch, absorption being promoted, if
the application of a hot iron.
n *pathology*, a term popularly
culous matter formed in the kid-
sing off in the urine; and some-
inct calculi or concretions in the
. See CALCULUS.
TER. See HYDROMETER.
. *Syn.* GRAVITATION. The at-
e by which bodies fall towards
of the earth. Weight is the
avity. The determination of the
hts of bodies with reference to a
rd, is explained under SPECIFIC

The juice or liquid matter that
dressed meat after it is placed on
serving. The common practice
is to pour a spoonful or two of
r or broth over the joint, to in-
quantity. The natural gravy that
the meat after it is cut is the
most wholesome. Made gravies
l by adding spice and flavouring to
g, or to strong meat soup. See

Syn. GREY; GRIS, Fr. A mixture
d white. Delicate grays result
es of the three elementary colours,
and blue, in which the blue pre-
to a greater or less extent.
E. *Syn.* TEINTE GRISE. Gray
h the same materials as black, but
h and mordant are used in a *more*
. *Cotton goods may be worked*

in sumach and then in copperas; this gives rather a bluish gray, which may be modified to any particular hue by the addition of suitable colouring matter. To make it yellowish, a small amount of fustic and alum are employed; to make it 'fuller,' peachwood and Lima-wood with alum are used. The methods of obtaining gray on SILK and WOOL are very numerous; they are similar in principle to the above, all depending on the blending of the three primary colours, or on the modification of weak blacks. See BLACK DYE.

GREASE. A general term applied to soft animal fats; as BEAR'S GREASE, GOOSE GREASE, &c.

Grease. An inflammatory affection of the heels of horses, which produces dryness, scurfiness, and stiffness. The *treatment* consists of emollient poultices, accompanied with physic and diuretic balls, to subdue the inflammation, followed by mild astringent lotions or ointments.

GREAVES. *Syn.* GRAVES. The sediment of melted tallow, consisting chiefly of animal membranes mixed with fat, made up into cakes. *Used* as a coarse food for dogs.

GRE'CIAN WATER. See HAIR DYES.

GREEN. *Syn.* VIRIDIS, L.; VERT, Fr. Of the colour of the leaves of growing plants; *subst.* a green colour.

GREEN DYE. *Syn.* TEINTE VERTE, Fr. All the green dyes in use, with the practically unimportant exceptions of Chinese green and oxide of chromium green, are compounded of blue and yellow. The goods, in practice, are generally dyed blue first, observing to regulate the shade according to that of the intended green; they are then dried, rinsed, and passed through a yellow bath, with the like precautions, until the proper shade is produced. See BLUE DYE, YELLOW DYE, &c.

GREEN PIG'MENTS. Several of the green pigments of commerce are obtained from copper. Oxide of chromium furnishes some which are very beautiful. Many are formed by the mere mechanical admixture of blue and yellow pigments. The bright blues and yellows, when mixed in this way, produce the liveliest greens; orange, or red and blue, and the yellowish browns and blue, the more dingy greens. In this way are produced all the extemporaneous greens of the artist. Nickel and titanium also furnish green colours, but these are not in common use. The following list embraces all the best-known and most useful green pigments:—

Green, Arsen'ical. Arsenite and aceto-arsenite of copper. See SCHEELE'S and SCHWEINFURT GREEN (*below*).

Green, Barth's. From yellow lake, Prussian blue, and clay, ground together.

Green Bice. Same as mountain green.

Green, Bremen. This is properly green verditer, but other preparations are frequently *sold under the name.*

Green, Brighton. A mixture of impure acetate of copper and chalk, prepared as follows:—

To sulphate of copper, 7 lbs., add sugar of lead, 3 lbs.; each separately dissolved in water, 5 pints; mix the solutions, stir in of whiting, 24 lbs., set the resulting paste on chalk stones, and when dry grind it to powder.

Green, Brunswick. This is properly a crude chloride of copper, but a mixture of carbonate of copper and alumina or chalk is now commonly sold under the name in the shops.

Prep. 1. A saturated solution of sal-ammoniac, 3 parts, is poured over copper filings or shreds, 2 parts, contained in a vessel capable of being closed up, and the mixture is kept in a warm place for some weeks, when the newly formed green pigment is separated from the unoxidised copper, by washing the mixture on a sieve; it is then edulcorated with water, and slowly dried in the shade. Colour very deep and rich. The lighter shades are produced by the addition of sulphate of baryta.

2. A solution of crude carbonate of ammonia or bone spirit is added to a mixed solution of alum and blue vitriol, as long as it affects the liquor; in a short time the precipitate is collected, washed, and dried. The various shades of green are produced by using different quantities of alum, which pales and cheapens it.

Green, Chrome. The superb green pigment used by enamellers under this name is the green oxide or sesquioxide of chromium. A hydrated oxide of chromium forms the emerald green of Pannetier; it is prepared by melting in a crucible equivalent quantities of anhydrous boracic acid and bichromate of potassium, and treating the fused mass with water. The hydrated oxide thus produced is washed and finely triturated.

The chrome green of the oil and colour shops is a mixture of chrome yellow and Prussian blue.

Green, Cop'per. Green bice or mountain green, Brunswick green, emerald green, verditer, and several other well-known pigments, may be thus named.

Green, Em'erald. This term is commonly applied to the aceto-arsenite of copper, as prepared in England. It is the same compound, chemically speaking, as Schweinfurt green (which *see*).

Prep. A pulp is formed with verdigris, 1 part, and boiling water, q. s., and after being passed through a sieve, to remove lumps, is added gradually to a boiling solution of arsenious acid, 1 part, in water, 10 parts, the mixture being constantly stirred until the precipitate becomes a heavy, granular powder, when it is collected on a calico filter, and dried on chalk stones.

Green, Frise. *Syn.* FRIEZLAND GREEN. This resembles Brunswick green.

Green, Gellart's. A mixture of cobalt blue and flowers of zinc with some yellow pigment.

Green, Impe'rial. Schwei
below).

Green, Iris. A pigment p
ing the juice of the petals of
quicklime. It is very fugitiv

Green Lake. See LAKE.

Green, Min'eral. This is t
tain green.

Green, Mitis. Another of
nyms of Schweinfurt green.

Green, Mountain. This pi
the native green carbonate c
copper (malachite) ground t
with or without the additio
ment or chrome yellow. Th
commonly prepared by addi
carbonate of soda, or of potas
solution of sulphate of co
Green verditer is commonl
article. According to Watt
is the same as Neuwieder gre

Green, Neuwieder. Schwei
with gypsum or sulphate of l

Green, Prussian. The sedi
cess of making Prussian bl
blood or horns, before it ha
chloric acid added to it. It i
pouring liquid chloride upon fi
Prussian blue. As now sold,
generally a mixture of P
gamboge.

Green, Rinman's. This r
Gellert.

Green, Sap. A very fugiti
pared from the juice of buckt
berries are allowed to fermer
eight days in a wooden tub.
pressed out, strained, a little
the whole evaporated to a pr
it is next run into pigs' bladd
in a dry situation to hard
article is made from the jui
and of evergreen privet. It i
tice to add ¾ pint of lime wa
gum arabic to every pint of ei
juices.

Green, Scheele's. This is a

Prep. 1. White arsenic (in
commercial potash, 2 parts;
35 parts; dissolve, filter, and
gradually, whilst still warm,
tion of sulphate of copper (cr
long as a precipitate falls;
newly formed pigment with w
dry it.

2. (Ure.) Powdered arsenic
carbonate of potassa, 1½ lb.
1 gall.; dissolve, filter, and a
as before, to another solutio
sulphate of copper, 2 lbs., in
Prod. 1½ lb. A very fine gra

Green, Schweinfurt. This
pigment is the aceto-arsenite c

Prep. 1. Acetate of coppe
acid, equal parts, are each dis
in the least possible quantity

mixed whilst still as hot as pos-
green precipitate falls, which,
in the liquor 5 or 6 minutes,
se granular powder of a superb

boiling the solution contain-
tate, it is allowed to cool and
al hours, or until the powder
alar and beautiful tint. Very

Arsenious acid, 8 lbs., is dis-
as before, and added to ver-
s., diffused through water, q. s.,
he pap of the latter being first
a sieve; the mixed ingredients
de till the mutual reaction pro-
r shade.
Sulphate of copper, 50 lbs., and
e dissolved in good vinegar, 20
ing-hot solution of white arsenic,
yed as quickly as possible into
e mixture is stirred several
allowed to subside, after which
n a filter, dried, and powdered.
t liquor is employed the next
ing the arsenic.
ALD GREEN (*above*).
a very fine, permanent green
great deal of needless alarm has
bout its supposed deleterious
ten-ively employed for staining
persons inhabiting rooms thus
to have had their health seri-
by the arsenical fumes evolved
it is utterly impossible that
latilize from such a compound
peratures; it does not decom-
temperature below redness."
is, however, probable that the
rtments is sometimes charged
ous pigment through its becom-
ly detached from the paper. To
osphere so impregnated would
The use of papers coloured
green, especially of the kind
should, therefore, be carefully

See COPPER (Acetates) and

iter. This is essentially a mix-
nd carbonate of copper, in uncer-
s, with chalk. Factitious green
tain green have a like composi-
RDITER.
s. The mineral called green

a. The same as Schweinfurt

CKNESS. See CHLOROSIS.
RE. This compound, so much
ent warfare, is believed to have
for its chief ingredient. Accord-
authorities, it was a mixture of
, and sulphur.
'S SALT. The *crude hydro-*
orphia, prepared by Gregory's

process. It is a double hydrochlorate of morphia and codeia.

GRIND'ING. The operation of reducing substances to powder by attrition or friction. In the laboratory, the term is chiefly applied to powdering by means of a mill or by mechanical power, in opposition to simple pounding or trituration in a mortar or with a slab and muller. All the principal powders, paints, &c., sold by the druggist, drysalter, and colourman, are reduced in the drug or colour mill. Recently machinery has even been applied to the common mortar. An ingenious and very useful contrivance of this kind is the 'mechanical mortar' of Mr. H. Goodhall, of Derby.

GRIND'STONES. (Artificial). Washed siliceous sand, 3 or 4 parts; shell-lac, 1 part; melt together, and form the mass into the proper shape whilst warm, with strong pressure. The fineness of the sand must depend on the work the stone is intended for. The same composition is formed upon pieces of wood, as corn rubbers, and for the purpose of sharpening knives, and cutting stones, shells, &c. See EMERY.

GROATS. *Syn.* GRITS; GRUTELLUM, AVENA DECORTICATA, AVENÆ SEMINA, AVENA (Ph. L.), L. Common oats, deprived of their exterior integuments or husks. This is generally effected in a mill, which, at the same time, cuts them into two or three pieces. When crushed flat, they are denominated EMBDEN GROATS.

GROUT. Mortar reduced to a thin paste with water, used to fill up the joints of masonry and brickwork. A finer kind is used to 'finish off' the best ceilings.

GRUEL. *Syn.* OATMEAL GRUEL, WATER G.; DECOCTUM AVENÆ, L. Oatmeal or groats boiled with water to a proper consistence, and strained. It is variously flavoured to suit the palate; but the addition of a little white sugar, and finely powdered Jamaica ginger, with or without a glass of wine, is the least likely to offend the stomach. Nutmegs, cinnamon, &c., frequently disagree with invalids. Sometimes milk or butter is added. Embden groats require less boiling than the common groats. Of oatmeal, the Scotch is commonly said to be the best.

The following directions for making gruel from oatmeal are given by Dr. A. T. Thomson:—"Oatmeal, 2 oz.; cold water, 1½ pint; rub the meal in a basin, with the back of a spoon, in some of the water, pouring off the fluid after the grosser particles have subsided, but whilst the milkiness remains; repeat this with fresh water, unite the washings, and boil until a soft, thick mucilage is formed."

GUA'IACIN. *Syn.* GUAIACIC ACID, PURE GUAIACUM RESIN. A substance having the nature of an acid, discovered by Trommsdorff in the wood and bark of *Guaiacum officinale.*

Prep. The tincture of guaiacum is treated *with hydrate of lime,* and the guaiacate of lime *thus formed is* decomposed with dilute sulphuric acid; it is purified by dissolving it in alcohol.

Prop., *&c.* Insoluble in water; soluble in alcohol and ether; it unites with the caustic alkalies, forming alkaline guaiacates (guaiacum soaps); air and light turn it green; gluten, mucilage of gum arabic, &c., turn it blue; nitric acid and chlorine turn it successively green, blue, and brown; tincture of guaiacin, added to hydrocyanic acid and sulphate of copper, produces an intense blue colour. (Pagenstecher.) A delicate photographic paper may be formed by washing unsized paper with an alcoholic solution of guaiacum resin, and afterwards with one of neutral acetate of lead. (Johnston.)

GUAIACUM. *Syn.* GUAIAC, GUM GUAIACUM, GUAIACUM RESIN; GUAIACUM (Ph. L.), (GUAIAC RESIN, GUAIACI RESINA, B. P.), The resin prepared by means of fire from the wood of *Guaiacum officinale*, by natural exudation, by incision, or by heat. (B. P.) This substance is often adulterated. When pure, its "fresh fracture is red, slowly passing to green; the tincture slowly strikes a lively blue colour on the inner surface of a thin paring of raw potato." (B. P.) Adulteration with resin may be generally discovered by the odour evolved when the guaiacum is heated. An alcoholic tincture of guaiacum, rendered milky with water, recovers its transparency on the addition of caustic potassa in excess; but this is not the case when resin is present.

Guaiacum is stimulant, sudorific, and alterative.—*Dose.* 10 to 30 grs., either in powder or pills; in chronic rheumatism, gout, obstinate chronic skin diseases, scrofula, syphilis, &c. It forms the active ingredient of the once celebrated 'CHELSEA PENSIONER,' and the 'GOUT SPECIFIC' of Mr. Emerigon. T
made by digesting 2 oz. of gu
48 fl. oz. of rum, for 7 or 8 days.
this was a table-spoonful every m
for a twelvemonth. Its other
similar to those of GUAIACUM,
marked. Sp. gr., 1·20 to 1·22.

Guaiacum Wood. *Syn.* L
GUAIACI LIGNUM (Ph. L.), L.
Guaiacum officinale. This is
the form of shavings, raspings,
decoctions only. See DECOCTION

GUANO. *Syn.* HUANHO, Peru
stance, now so extensively used
is the partially decomposed excre
tain aquatic birds, chiefly the co
which congregate in countless
the barren and uninhabited is
on the western coasts of South
the coasts of Africa. It abound
and the phosphates, and is und
richest natural manure known.
cious application, the increase of
grain, turnips, potatoes, and gra
upon its use, is said to be about
is peculiarly adapted to horticult
cultural improvement, by its re
ness and facility of application."

"According to Denham Smith
rican guano, as imported, pres
three distinct states, the three
not unfrequently mixed togethe
bag; the first variety is damp an
the second exists as large concret
ing various aspects when broken
heavy and crystalline, and is t
by the labourers. These three
widely in composition, as the f
prehensive analysis, by Smith, w

Soluble in Water.

	I. Pulverulent.	II. Concrete.
Water	222·00	250·00
Chloride of ammonium	25·50	—
Sulphate of potash	80·00	—
„ soda	traces	258·44
Oxalate of ammonia	74·00	93·90
„ soda	—	—
Phosphate of ammonia	63·30	61·24
„ potash	—	77·32
„ soda	1·20	—
Chloride of sodium	—	29·22
„ potassium	—	—
Organic matter	15·00	6·68
Urate of ammonia	154·18	—
Uric acid	25·16	—
Ammonia phosphate of magnesia	5·64	7·84
Animal matter	11·80	8·60

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[1] 'Proceedings of the Chem. Soc.,' vol. ii.

Insoluble in Water.

	I. Pulverulent.	II. Concrete.	III. Saline.
of lime	25·60	109·58	—
ate of lime	199·30	62·70	132·23
magnesia	20·30	8·74	25·80
f iron	—	—	1·56
and organic matters	60·92	8·00	18·36
	15·60	7·20	4·20
	·50	10·54	7·78
	1000·00	1000·00	1000·00

the South American guano beds
ted, but new varieties are con-
introduced; and although the
ontinually varying, guanos, on
y be divided into two classes,
cterised by the abundance of
ther by that of phosphates, the
ngamos being characteristic of
the Saldanha Bay and Bolivian
In selecting a guano, the fol-
Anderson) ought to be attended
r:—
uano should be light coloured
ing very slightly when squeezed
ot gritty.
uld not have too powerful an
ell, and should contain lumps
oken, appear of a paler colour
r.
bel should not weigh more than
pounds.
racters are, however, imitated
ll, so that they cannot be im-
pon, and they are applicable to
o only."[1]
lteration. Guano, owing to its
ery commonly adulterated, or is
d stage of decomposition when
of what is vended under the
gether a fictitious article. These
ures are made to look so like
o, that the mere practical man,
ly by their appearance, is very
d by them, and, owing to the
crops in consequence, is led to
efficacy of guano as a manure.
pretended guano examined by
found to contain, in the state
as sold, more than half its weight
the rest being peat or coal ashes,
e common salt, crude sul- phate
, and either dried urine or the
e glue manufactories, to give it
'I could not satisfy myself that
a particle of real guano."[2] Ves-
sels which sail hence for the guano stations, are now very commonly ballasted with rough gypsum or plaster of Paris. This substance is mixed with the guano as it is loaded, and enables the importers to deliver from the vessel a "nice-looking, light-coloured article." Purchasers of guano are very desirous of having it delivered from the vessel, as they believe they thus obtain it pure. The favourite material for the adulteration of guano, at the present moment, is a variety of umber, which is brought from Anglesea in large quantities. The rate of admixture is said to be about 15 cwt. of umber to about 5 cwt. of Peruvian guano, from which an excellent-looking article is manufactured, which is sold under the name of 'African guano.'

Pure guano has a pale-brown colour, a more or less offensive odour, and the average sp. gr. of 1·63 to 1·64. If the sp. gr. exceed 1·75, it is either damaged or adulterated; and if it is less than 1·62, it contains an undue quantity of moisture. The best is neutral to test-paper, and sometimes has even an acid reaction; but that of commerce has generally an alkaline reaction, owing to the presence of free ammonia, and, in consequence, turns turmeric paper brown, and gives white fumes when a glass rod dipped in hydrochloric acid is held over it. Triturated with quicksilver or caustic potassa, good guano evolves a powerful odour of ammonia; digested in water, fully one half of it is dissolved; dried by the heat of boiling water, it does not lose more than from 7 to $9\frac{2}{3}$ in weight; and burned upon a red-hot shovel, it leaves a white ash, not a red or dark-coloured one. (See directions for selecting guano given *above*, also *below*.)

Analysis or *assay*. The quantitative analysis of guano, so as to exhibit the names and proportions of all its numerous component substances, is an extremely tedious and difficult matter in the hands of persons unaccustomed to chemical manipulations. As, however, its value to the agriculturist depends chiefly on its richness in ammonia, potassa, and *phosphoric acid*, the analysis of guano for *practical purposes* may be reduced to an assay

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particulars are from an elaborate paper by
d, in the 'Chemist and Druggist,' *vol. ii.*
Agric. Chem.'

for these articles. Indeed, the presence of ammonia (the most valuable of them), in the proper quantity, may be fairly taken as evidence of the presence of the rest. The following methods of testing guano are both simple and accurate, and are so arranged as to permit its per-centage richness in one or more of its leading constituents to be determined without much trouble or expense.

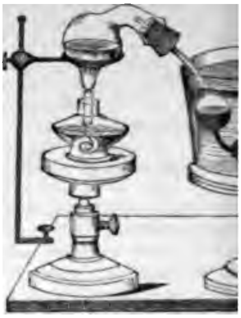
1.—*a.* 100 grs. of the sample for examination (fairly selected) are crushed to a powder, and placed on a small, weighed, and perfectly dry paper filter, and then desiccated, by exposure for 2 or 3 hours to the heat of boiling water. The loss in weight, taken in grains, after deducting 9, indicates the quantity per cent. of water or moisture which the sample contains in excess of that present in good or pure guano.[1]

b. The paper filter, with its contents, is next suspended for some time over concentrated sulphuric acid (oil of vitriol) contained in a wide-mouthed bottle or jar, by means of a thread attached to the cork or stopper, care being taken to exclude the external air. The exposure in this way is continued until the guano ceases to diminish in weight, which is ascertained by weighing it at intervals after the first 3 or 4 hours. When this point is arrived at, the filter and its contents are very carefully weighed. The difference between its present weight and its original weight (before the desiccation in *a*), taken in grains, gives the gross quantity of water per cent.

c. The dried guano from (*b*) is next placed in a weighed, smooth crucible or capsule, and exposed to a low red heat until all the organic matter is completely destroyed, and the whole is reduced to a white ash, which is weighed as soon as it has become cold. This weight, in grains, gives the gross weight per cent. of non-volatile matter (fixed alkaline and earthy chlorides, phosphates, and sulphates); the total loss of weight by combustion denotes the gross per-centage of combustible and volatile matter (urea, uric acid, ammoniacal salts, and organic matter). The latter should not be less than 55 to 60%.

2.—*a.* A second 100 grs. of the guano, selected as before, is distilled along with about 75 grs. of fresh-slaked quicklime, and a little water, in a small matrass connected with a tubular, triple bulb-condenser, containing cold distilled water, and immersed in a basin of ice-cold water. (See *engr.*) The condenser is charged by plunging one of its extremities into the water, and sucking at the other, until the liquid reaches the level indicated in the margin. A very gentle heat only, cautiously increased, need be employed. After the process is over, the strength of the solution of ammonia found in the condenser is tested, either by taking its density in a small specific-gravity bottle, or by determining its saturat-

ing power in the manner
Alkalimetry. This furnish



of ready formed ammonia
rate for all ordinary purpose
care is taken.

When extreme accuracy
condenser is charged with
of dilute hydrochloric acid of
instead of water. and after
this is tested as before. Th
moniacal test-liquor (see A
taken to saturate it, dedu
would have taken before th
condenser, gives the per-cen

Another method, giving
sults, is to use a rather st
acid (sp. gr. about 1·13) f
after the operation is over,
latter are poured into a gla
sule, a solution of bichlori
added, in excess, and the w
evaporated to dryness; the
to powder, and exhausted
two measures of alcohol an
ether; the undissolved porti
a heat not exceeding 212° F
The weight, in grains, of the
of platinum thus obtaine
·0763, gives the per-centag
ammonia, as before. Whe
is used for the condenser,
simple U tube and beake
glass may be employed, if
bulb-condenser is not a
hand. (See *engr.*) The ad
vantages resulting from th
use of acid instead of wate
for the condenser is, tha
with the former no ammo
nia can possibly escape bein
absorbed, whilst little car
is required to keep the con
denser cool.

b. 25 grs. of the guano
and after being slightly
little dilute hydrochloric ac
dried by the heat of boiling
sample is then mixed in
porcelain mortar with 10

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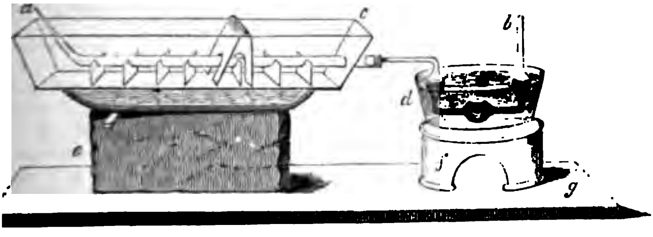
[1] According to Dr. Noad, the proportion of water in genuine guanos ranges from 7 to 20%.

parts of quicklime to 1 part of a (both quite dry). This mixced into a combustion tube of ı glass, about 16 or 18 inches an inch in diameter. (See *engr.*) rubbed out with a little of the ture, which is also introduced

with that already put there; a **ign**ited **asbestos** is then loosely **e** whole, and the tube is imme**cted** with a tubular bulb-con**ning** moderately strong hydro**great** care being taken that the **le air-tight**, which may be deter**operator** sucking a few bubbles **paratus.** If, after suction, the **at a higher** level in the furthest **a sign** that the connection is **being** done, heat is applied to **n-tube** by means of spirit-lamps; **eniently**, by means of the furnace **mployed** in organic analysis. (See **ube** is next gradually surrounded **charcoal**, by shifting, by degrees, **, and adding** more charcoal, so as **expel** the ammonia. The disen**gas** should take place uninter**not** too rapidly, in order that the acid may not ascend into the combustion-tube and spoil the experiment. The non-condensable volatile matters which pass off furnish a key to the progress of the operation. The heat is at length increased to a full red. When gas ceases to be evolved, and the mixture in the tube has become quite white, the experiment is at an end. The point (*a*) of the combustion-tube is broken off, and the ammonia which remains in the tube is expelled by sucking gently at the extremity (*b*) of the bulb-condenser. The latter is then disconnected with the apparatus, and emptied into a glass or porcelain capsule, in order to be tested, as directed under 2, *a*. The quantity of ammonia, in grains, thus found, multiplied by 4, gives the WHOLE QUANTITY of AMMONIA per cent., both actual and potential, producible from the sample of guano examined.

c. The quantity of ready formed ammonia (see 2, *a*) deducted from the quantity last found (see 2, *b*) gives the quantity of LATENT or POTENTIAL AMMONIA that will be slowly developed by the decomposition of the guano in the soil, and become available for the food of plants. This is the most valuable product of this substance as a manure, and can only be obtained in quantity from well-preserved, dry guano.

3.—*a.* A third quantity of 100 grs. of the guano, selected as before, is triturated and digested for some time with 12 times its weight of hot distilled water, and the whole being thrown on a filter, the undissolved portion is



a little warm distilled water; the **'washings'** are then mixed toge**acidulated** with nitric acid; a solu**nitrate** of iron is next added, and **solution** of ammonia, in excess; **next heated** for a short time, and **eddish-brown** precipitate is collected, **th hot** water, dried, ignited, and **The weight**, in grains, less the weight **xide** of iron in the pernitrate con**es the weight** of PHOSPHORIC ACID **the soluble** phosphates contained in **. The** pernitrate of iron is made **olution in hot** strong nitric acid, of **ch pure iron wire as** there is phos**d suspected** to be present in the **slight excess** will not alter the re**number of grains** of metallic iron **n the solution**, *multiplied by 1·4286*, gives the weight of the peroxide of iron which is to be deducted from the gross weight of the precipitate.

b. The filtrate and 'washings' left from 3, *a*, are mixed, and treated with a little oxalate of ammonia to throw down any lime, and then carefully evaporated to dryness and ignited; the residuum of the ignition, when cold, after being carefully weighed, is treated with the smallest portion of water that will dissolve it; the solution is acidified with hydrochloric acid, and a solution of bichloride of platinum added, in excess; some strong alcohol is next poured in, the precipitate carefully collected on a filter, washed with rectified spirit, dried at 212° Fahr., and weighed. The weight, in grains, multiplied by ·1940, gives the percentage of POTASSA sought.

c. The weight of the potassa multiplied by

1·852, and deducted from the weight of the ignited residuum in 3, *b*, already found (*see above*), gives the quantity of CHLORIDE OF SODIUM or COMMON SALT (nearly).

4.—*a*. The insoluble residuum from 3, *a*, dried, and ignited, or the ash from 1, *c*, is digested for 10 or 12 hours in 600 times its weight of water (to which a little common salt or sal-ammoniac may be added), after which the whole is thrown upon a filter; a solution of chloride of barium is then added to the filtrate as long as a precipitate (if any) forms; the latter is collected, washed, dried, ignited, and weighed. The weight, in grains, multiplied by ·5813, denotes the quantity of GYPSUM or SULPHATE OF LIME which has been used to adulterate the sample.

b. The insoluble residuum last left on the filter is digested for some time in warm dilute hydrochloric acid; the whole is then thrown upon a filter, and the undissolved portion (SILICA or SAND, with, perhaps, a trace of ALUMINA), is washed, dried, ignited, and weighed. It should not weigh more than 3 to 3½ grs. (3 to 3½ %).

c. The filtrate and 'washings' from *b* are next mixed together; the mixed liquid is acidified with dilute sulphuric acid and heated until all the hydrochloric acid is expelled, and the whole reduced to a soft pasty-mass; rectified spirit is now poured in, and after active stirring for some time, the mixture is thrown on a filter, and the solid portion washed with a little more rectified spirit; it is then dried, ignited, and weighed. The weight, in grains, multiplied by ·7650, gives the quantity of PHOSPHATE OF LIME per cent. required.

d. The filtrate from *c* is diluted with water, and after being boiled for a few minutes, ammonia is added in slight excess, followed by a solution of sulphate of magnesia (previously mixed with as much sal-ammoniac as will prevent ammonia producing a precipitate in it), slowly dropped in as long as it disturbs the liquor; the whole is now allowed to rest for 10 or 12 hours, when the precipitate is collected on a filter, and washed with water alkalised with ammonia, as long as the filtering liquid is rendered turbid by chloride of barium; it is next dried, submitted to intense ignition for some time in a covered platinum crucible, and when cold, carefully weighed. The weight, in grains, multipled by ·6429, indicates the per-centage of PHOSPHORIC ACID in the insoluble phosphates (phosphates of lime, magnesia, &c.) in the sample examined.

5. A fourth 100 grs. of guano is weighed, and exhausted by trituration and digestion with hot water (see 3, *a*); the solution is evaporated to dryness by a gentle heat, and the residuum of the evaporation, after being weighed, is powdered and enclosed in a stout phial with 8 times its volume of alcohol, sp. gr. ·825 (63 o. p.); the plant is next securely corked and guarded, and exposed for some time, with agitation, to the heat of 212° Fahr.,
the whole is then allowed to coo
of the phial filtered, the undis
washed with hot alcohol, and b
and the 'washings' gently evap
ness, and weighed. This gives
the sample in UREA, one of the
constituents of the best guano.
is "a certain proof of its enti
(Ure.)

6.—*a*. Another 100 grs. of the
and after being exhausted with
at 212° Fahr., and weighed; it i
with heat in 20 times its we
water (containing 1 % of borax),
of caustic potassa, and after a
is thrown on a weighed filter,
little cold distilled water, dried
higher than that of boiling wa
carefully weighed. The loss, i
cates the proportion per cent. o

The accuracy of the result r
by adding dilute hydrochloric
excess, to the filtrate, collecti
crystalline precipitate of ur
forms, washing it carefully wit
fied spirit, drying it, and weig
fore. This weight, which in g
little under that denoted abo
accurate of the two. The preci
to be uric acid by its assuming
colour when treated with a lit
which turns to a rich purple (
it is moistened with ammonia v

b. The quantity of uric aci
multiplied by 1·1012, gives the
URATE OF AMMONIA.

Obs. Amongst the numerous
guano, none are so valuable in
point of view as the three sub
to in the last two sections. In
the ammonia furnished by thi
the soil, after the latter, manu
been exposed to the air and
from the slow decomposition of
of ammonia. It is these substan
the store of latent, or, as Dr.
potential ammonia, is derived.
existing in the guano under t
bonate, or of soluble salts (rea
monia), is either soon dissipat
washed away by heavy rains,
forms the least valuable and
of this manure. It may be ev
ficially, a matter almost impo
former. An assay, therefore,
ammonia, or the urea, or the ura
any one of them singly, at onc
as we have already hinted, wi
the quality of the guano exa
the expense and trouble of a co
of this substance. Urea and ur
to be found in the very best sa
and their presence is a positive
soundness and superior qualit
valuable portions of guano ar
phosphoric acid (phosphate of

f little importance. (See 2, c,

. *Syn.* PAULLINIA, BRAZILIAN
alimentary and medicinal sub-
d from the seeds of *Paullinia*
zilian tree. The dried seeds,
their aril, are pounded and
a mass, which is afterwards
long or rounded cakes (GUARANA
se cakes are used as we use cho-
. with water and sugar, and
verage. In Brazil this beverage
sumed, both on account of its
ities, and for its stomachic, febri-
rodisiac effects. See CHOCOLATE,
?.

IE'. A crystalline substance
M. Martius, in guarana. It
e identical with caffeine, the
le of coffee and tea.

. The *Cyprinus gobeo* (Linn.), a
ater fish, common almost every-
white is considered the best.
ly used in medicine.

s. GUMMI, L. The general
nportant class of vegetable pro-
are more or less soluble in cold
luble in alcohol, ether, and oils.
ned from certain plants in amor-
; most of them exude sponta-
puncturing the bark. The most
this class is the substance called
or GUM ACACIA. The gums are
lemulcents in medicines, and are
ts, and for giving stiffness and
le fabrics. Among the vulgar
often incorrectly applied to the
m resins.

a. *Syn.* GUM ARABIC; ACACIÆ
); G. ARABICUM, G. ACACIA, ACACIA
"From various species" (of *Acacia*)
m" (Ph. L. & E.), chiefly *Acacia*
A. vera. "Whitish or yellowish,
or cracked on the surface, and
tle; it dissolves freely in water."
is scentless, and may be bleached by
the sun and air, at the temperature
ater. Sp. gr. 1·355. (Ure.) The
principle of gum arabic is termed
which *see*). BARBARY or MO-
, GUM SENEGAL, and EAST INDIA
inferior commercial varieties of the
tance from other species of *Acacia*
).

d gum arabic (PULVIS ACACIÆ) is
adulterated with flour or farina, or
gal or other inferior gums. The first
tected by agitating a little of the
ith cold water; the pure gum dis-
idly, whilst the starch or flour falls
tom of the vessel. Or, a little of
r may be mixed with boiling water,
cold, tested with tincture of iodine;
ins starch or flour, the paste will
blue colour. If it contains cherry-tree
gacanth, *it will be only partly soluble* in cold water, and the paste will be partly coloured, and more or less interspersed with gelatinous clots.

Much of the white gum arabic of the shops is formed by bleaching gum Senegal, by what is called 'Picciotto's process.' The gum is dissolved in water, and sulphurous acid gas passed through the solution. The liquid is afterwards boiled to expel the sulphurous acid, a little of which, however, still remains behind. To obtain the gum in a still whiter state, carbonate of baryta is added, and after agitation, the mixture is filtered; it is afterwards shaken with gelatinous alumina, again filtered, and evaporated. The product (BLEACHED GUM) is very white, but lacks the peculiar toughness and adhesiveness of the best gum acacia.

Gum, Barbary. *Syn.* MOROCCO GUM. An inferior product, consisting of a mixture of several Acacia gums. It is exported from Mogador

Gum, Bassora. A solution of yellowish gum brought from the neighbourhood of Bassora. It differs from most gums in being nearly insoluble in water. The plant yielding it is believed to be a species of *Mimosa.* It contains the principle, BASSORIN, which also exists in gum tragacanth.

Gum, Bleached. See GUM ARABIC (*above*).

Gum, British. *Syn.* DEXTRIN, STARCH GUM. Starch converted by the action of acids, diastase, or heat, into a soluble substance resembling gum.

Prep. 1. Malt (crushed small), 1 lb.; warm water, 2 galls.; mix, heat the whole to 145° Fahr., add of potato starch, 5 lbs., raise the heat to 160° or 165° Fahr., and mash for about 25 minutes, or until the liquid becomes thin and clear; it must then be instantly run off, and raised to the boiling-point to prevent the formation of sugar; after boiling for 3 or 4 minutes, the whole must be filtered, and evaporated to dryness by a steam heat.

2. By exposing dry potato starch, in a stove, to a heat of about 400° Fahr. Yellow and inferior.

.3 (M. Payen.) Dry starch, 1 ton, is moistened uniformly with concentrated nitric acid, 4½ lbs., (diluted with) water, q. s., and the paste or dough is made up into small bricks or loaves, and dried in a stove; it is next reduced to coarse powder, and exposed in a stove-room for some time to a current of air at 160° to 165° Fahr.; it is next ground, sifted, and exposed, as before, to a heat of about 228° Fahr.; it is, lastly, ground, and passed through the 'bolting machine.' Very white and superior. This process has been patented in France by M. Henzé.

4. (Pinel.) Water, 100 galls., nitric acid, ½ gall., and hydrochloric acid, ¼ pint, are mixed together, and so much potato starch is mixed as will form a thin paste; in two hours the liquid is drained off, and the solid matter *is made up into lumps,* which are dried by a *gentle heat* in a stove-room; they are next

coarsely pulverised, and the powder is exposed on three successive days to the respective temperatures of 100°, 150°, and 190° Fahr.; the whole is then sifted, and, lastly, exposed to a heat ranging from 300° to 350° Fahr. Darker coloured than the last. To give it the appearance of gum arabic, it is made into a paste with water containing 1% of nitric acid, and after being spread on copper plates in layers ¾ to 1 inch thick, it is exposed to a stove heat ranging from 240° to 300° Fahr.

Prop., &c. White; insipid; transparent; friable; soluble in cold water, and in dilute spirit; insoluble in alcohol and ether; its solution yields a precipitate with acetate of lead. Iodine commonly turns commercial dextrin blue, but does not affect the colour of pure dextrin. It is distinguished from ordinary gum by its right-handed polarization of light, and by yielding oxalic but not mucic acid, when treated with nitric acid.

Dextrin is nutritive, emollient, and agglutinant. In France it is largely employed by the pastry-cooks and confectioners, and in medicine as a substitute for gum. The French surgeons also commonly employ it as a 'stiffening' for the splints used for fractured limbs. In this country it is chiefly used as a fine dressing for muslins, silk, and other textile fabrics, and in calico printing. Recently it has been made up into tear-like masses, and sold for gum arabic, to which, however, it is vastly inferior as an agglutinant. See DEXTRIN.

Gum, Cherry-tree. *Syn.* FRUIT-TREE GUM, PLUM-TREE G.; GUMMI CERASI, G. PRUNI, L. An exudation from the stems of cherry, plum, and some other of the *Rosaceæ*. It is only partly soluble in water. It contains CERASIN (which *see*).

Gum, East India. This product, which consists of inferior kinds of gum acacia, is chiefly exported from Bombay, having been previously conveyed there from the coast of Arabia. It varies greatly in quality. Some samples are quite unfitted for making gum-water.

Gum, Insoluble. See BASSORA GUM, CHERRY-TREE GUM, and GUM TRAGACANTH.

Gum, Seed. *Syn.* GUMMI SEMINUM, L. A species of soluble gum extracted from the seed of the flax (linseed), quince, &c.

Gum Senegal. This product, which is largely exported from Portendic, Sierra Leone, and the French settlements on the Senegal, ranks next in quality to gum acacia, and for many purposes, as calico-printing for instance, it answers equally well. The transparent and light-coloured pieces are frequently picked out and sold as gum arabic.

Gum Trag'acanth. *Syn.* TRAGACANTH, GUM DRAGON; GUMMI TRAGACANTHA, G. DRACONIS, TRAGACANTHA (Ph. L.), L. The gummy exudation of the *Astragalus verus*, hardened by the air. When digested in water, it swells considerably, a portion is dissolved, and the whole combines to form a thick mucilage. It is totally soluble i
when some change is suppos
in it; a great portion, howe
separates. Sp. gr. 1·384. I
ployed in calico-printing, and
and lozenge-makers; by the
toughness to the saccharine m

Powdered tragacanth is
with flour of starch, and
with the commoner varieties
According to M. Planche, a
verised tragacanth and gum a
water, a thinner mucilage tha
tity of either of these gums a
may be detected as follows:—
of the suspected gum, and a
drops (2 or 3 to the dr.) of alc
guaiacum, taking care to stir
If the sample contains any
mixture, in the course of a
sumes a fine blue colour, w
change colour if the gum tr
5% of gum arabic can be thus
the quantity is very small, o
may elapse before the colo
Starch and flour are detect
noticed under GUM ARABIC.

Gum, Turkey. Various q
acacia are sold under this nam

GUM RES'INS. *Syn.* GU
Vegetable products in which t
gum and resin are combined.
soluble in water, and partly i
of them form a species of e
turated with the former fluid
gum resins are AMMONIACU
BDELLIUM, GALBANUM, GA
OLIBANUM, OPOPONAX, SAGAP
MONY.

GUN BAR'RELS. See BRO

GUN COT'TON. See PYRO

GUN MET'AL. An alloy con
copper and 9·5% of tin, used f
of ordnance (erroneously term
also those parts of machinery
jected to considerable frictio
BRONZE, STEREO-METAL, &c.

GUN'POWDER. This subst
nical mixture of saltpetre, ch
phur. It is seldom prepare
scale.

Prep. The saltpetre havin
fined, by boiling, skimming
crystallising, is melted into
then brushed to remove any
dirt, broken into pieces with
to a fine powder in a mill, an
a fine bolting sieve of brass w
coal is that of the alder or
carefully burnt, as already d
then reduced to powder. The
fined by distillation, and grou
fineness as the charcoal and
ingredients are weighed out in
portions, and mixed together
consisting of a wooden drum,

its centre, to which numerous
shape of knife-blades are at-
m and flyers revolving in a
n. When mixed, the charge
'incorporating mill,' where it
r vertical iron 'mill-stones,'
ntity of distilled water, until
are thoroughly incorporated.
his operation is then pressed
e, which is next broken into
ed by means of sieves, and
ed' by friction, and the dust
ied, with proper precautions,
ted to about 130° by steam

ons of saltpetre, charcoal, and
or different kinds of powder,
htly. In 'sporting powders'
of saltpetre is generally from
than in the Government pow-
ers' powders' it is about 10%
of sulphur being used. The
he proportions adopted by Eu-
.—

altpetre.	Charcoal.	Sulphur.
75	15	10
75	12·5	12·5
75	15	10
75	13·5	11·5
73·78	13·59	12·63
76·47	10·78	12·75
76	15	9

(Capt. Jervis-White Jervis.)

uality of gunpowder is best esti-
ual trial of its power and clean-
It should be dry, hard, and
st; the grains should be of a
and glossy, and the colour a
r brownish-gray, not perfectly
ery little placed on a piece of
ed should instantly explode with
neither leave an appreciable resi-
aper nor burn it. Dried by the
ng water, or in vacuo, it should
re than ½ to 1% of its weight.
r rapidly 'fouls' the gun. Gun-
taining more than 7% of water,
over its strength by simply drying
. gr. ranges between 1·755 and

r, **White.** *Syn.* Blasting pow-
. 1. See Blasting Powder,

w prussiate of potash and white
ch, 1 part; chlorate of potassa, 2
der each separately, and mix them
carefully, with a bone or wooden
ay be granulated like gunpowder.
the powder into a paste with a
, and pressing the mass through a
sieve.[1]

I. See Hemp (Indian).

yn. Fishing gut, Silkworm g. This is obtained from the *Bombyx mori* (Linn.) or silkworm caterpillar. *Prep.* The silkworms, when just ready to spin, are steeped in strong vinegar for 12 hours in warm weather, or 2 or 3 in cold weather, and are then broken in half, and stretched out as far as possible on a board, furnished with slits or pegs to hold them; in this state they are allowed to dry in the sun or a warm place.

Obs. Used by anglers. The worms may be known to be going to spin by refusing food, and by having a fine silken thread hanging from the mouth.

GUTTA PERCHA. The concrete juice of the *Isonandra Gutta*, a tree growing only in the Malayan Archipelago, and of other species of the same genus. The stem of the gutta-percha tree grows to the diameter of 5 or 6 feet, and on being notched yields a milky juice, which, after exposure to the air for some time, solidifies, forming the gutta percha of commerce. It arrives in this country in irregular blocks of some pounds in weight, usually containing a large portion of impurities in the form of pieces of wood, stones, and earth. To prepare this crude product for manufacturing into useful articles, the blocks are first cut into slices, and then torn into shreds. These are softened by hot water, and kneaded in a 'masticator,' the stones, earth, and other impurities, being gradually washed away by water. After several hours the gutta percha is found to be kneaded into a perfectly homogeneous mass, which is rolled or drawn into sheets, bands, or tubes, as required.

Prop., &c. Gutta percha is a tough, inelastic substance, becoming soft and plastic at 212° Fahr., at which temperature two pieces may be firmly welded together. It is one of the best insulators of electricity, is impervious to moisture, and resists the action of acids and alkalies to a great extent. Its best solvents are benzol, chloroform, bisulphuret of carbon, rectified mineral naphtha, and rectified oil of turpentine. All these dissolve it readily. According to the analysis of Payen, the purified gutta percha of commerce consists of 75 to 82% of chemically pure gutta percha, which is insoluble in ether and alcohol, and a white and a yellow resin, soluble in boiling alcohol.

Uses. These are numerous and varied. No substance, perhaps, with the exception of caoutchouc, has been 'tortured' to so many different purposes. Its perfect plasticity when warm, and its capability of receiving the most delicate impressions, render it invaluable in many cases where India rubber would be useless. Beautiful mouldings, picture-frames, and a number of ornamental articles, are made from it. To the chemist and photographer it is of great use as a material for making bottles, carboys, photographic baths, and voltaic battery cells. One of the most important uses to which it has been applied is for enclosing the metallic wires used for telegraphic purposes. Its indestructibility by water, its plasticity, and high insulating power, have rendered it particularly valuable for this purpose. At the International Exhibition of 1862 the Gutta Percha Company exhibited one mile of covered wire perfectly insulated, which was hardly thicker than common sewing cotton. Gutta percha may be rolled into thin transparent sheets, which, being perfectly impervious to moisture, are well adapted for surgical purposes. Again, a solution of gutta percha in chloroform forms an excellent dressing for incised wounds, and a protection for abraded surfaces, burns, &c. It is used in the same way as collodion.

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[1] tions noticed under Blasting Powder

Purified Gutta Percha. Dr. Cattell, of London, has succeeded in purifying gutta percha so perfectly from all extraneous matter, that it presents the appearance of ivory. The raw material is dissolved in a certain solvent, and the solution most carefully filtered until it leaves on evaporation the gutta percha in a pure milk-white condition.

GYP'SUM. This is native sulphate of lime. When baked, to deprive it of water, and ground, it forms PLASTER OF PARIS. Gypsum is an excellent manure for certain soils.

HAD'DOCK. A small sea-fish, allied to the cod, and esteemed an excellent article of food. It is the *Gadus æglefinus* of Linnæus. Split, smoked, and dried, it is common in the smaller shops of London.

HÆMATEM'ESIS. In *pathology*, vomiting of blood. See STOMACH DISEASES.

HÆM'ATITE. *Syn.* HEMATITE. In *mineralogy*, one of the most important iron ores. Two kinds are distinguished, the red, which is an anhydrous peroxide of iron, and the brown, which is the hydrated peroxide.

HÆMATOCRYS'TALLIN. A crystalline substance obtained by the action of oxygen and afterwards carbonic acid on the 'clot' of blood.

HÆMATOS'IN. *Syn.* HÆMATIN, RED PIGMENT OF BLOOD. The red colouring principle of the blood. It is not known in a state of purity. It differs from the other animal principles in containing, as an essential ingredient, the sesquioxide of iron.

HÆMATOX'YLIN. A principle obtained by Chevreul from common logwood (*Hæmatoxylon campechianum*), and on which its colour appears to depend.

Prep. 1. Infuse logwood chips in water, at a temperature of about 130° Fahr., for 12 hours, filter, and evaporate to dryness in a water bath; digest the residuum in rectified spirit for 24 hours, again filter and evaporate; then add a little water; again gently evaporate and set aside the solution in a cold place that crystals may form; these must be washed in rectified spirit and dried.

2. Digest powdered hard extract of logwood in rectified spirit, and proceed as last.

3. Powdered logwood is mixe
and digested for several days in
the resulting liquid is filtered, e
a syrup, and set aside to crystallis

Prop., &c. Brilliant reddish-wh
yellow crystals, soluble in boiling
ing an orange-red solution which
as it cools, but resumes its form
being heated. Alkalies in exce
colour successively into purple
brown; acids brighten it; with
oxides it forms compounds ha
purple, or violet colour.

HÆMOP'TYSIS. In *patholog*
blood. It generally arises from
ness of the blood-vessels of the
rupture of blood-vessels, as a co
ulceration; but sometimes it i
excessive exertion or external vi
pletion, aperients, acidulous an
drinks, and nauseants, are the us
Acetate of lead, in small doses.
commended for this affection. W
stance is given, it should be accom
a sufficient quantity of free ac
prevent its being converted into t
carbonate of lead in the system.

HÆM'ORRHAGE. *Syn.* HE
HÆMORRHAGIA, L. A bleeding
blood. Bleeding may be divided
passive, and accidental.—Active
is that arising from a full state of
or plethora, — Passive hæmorr
general debility of the system,
blood-vessels in particular,—Acc
morrhage, from external violenc
wounds, &c. The first generally
pletion, and the second the usual
establish the general health and vi
body. The bleeding from wounds,
should be arrested by tying th
blood-vessels; or where this cann
and in less important cases, by the
of styptics, as creasote, sulphate
fusion of galls, compound tincture
&c.

HAIR. *Syn.* CAPILLUS, PILU
hair of the human head has continu
a subject for the chisel of the s
pencil of the artist, and the lay o
Nor is this surprising, since all the
the face, as well as the head it co
from it additional finish and unequ
The hair is, indeed, one of the gr
iliaries of personal beauty, and im
some of its principal charms. All
all ages of the world, have been un
their admiration of luxuriant and
gracefully arranged hair.

Of all organic substances, hair i
least liable to suffer spontaneous c
is also less affected by aqueous liq
most other substances. Hence its
various branches of the useful arts.

The preservation of the hair of
independently of its connection wi

:er of the utmost importance
giene. In other parts of this
referred to its management
onditions, but a few observa-
led here.

ir is in a weakly state, and
or grows feebly, frequently
e found of the greatest ser-
rrangement of the hairs on the
ody, it might be inferred that
excite attention; but this is
we are to judge by the careful
o which the subject has given
-tubes are not placed perpen-
obliquely, in the skin; hence
f the hairs, after their escape
is in the same sense inclined
face; and the 'set' of the hair,
o the point, is governed by a
as that which regulates any
ondary vital functions. Thus,
e hair radiates from a single
n, to every part of the circum-
g a gentle sweep, behind to-
, and in front to the right.
f this sweep is naturally indi-
ads of children, and is that in
is turned." (Eras. Wilson.)
s on the face and other parts
n making our toilet, this natu-
t of the hair should be inter-
little as possible. Combing it
n an opposite direction to that
rally assumes, is highly preju-
althy growth, and if long per-
ls to its premature and rapid
practice now common among
ving the hair from the forehead
ck of the head, is of this repre-
ter.

to our remarks elsewhere, we
ve, that all the various systems
strengthening or restoring the
for their efficacy upon simple
imulation of the skin. Friction
brush, and the use of the ordi-
pomades, and washes, are of
be various advertised nostrums
ng or restoring the hair are
nts or rubefacients of more or
or are emollients, which are di-
applied by friction, in such a
set up a considerable amount
When the affection depends on
irculation of blood in the part,
t often succeeds; but when the
e withered or decayed, or the
ttenuated, the restoration of the
ossibility. See BALDNESS.

METICS. Under this head are
preparations which are used for
preserving, or restoring the hair.
y described in different parts of
d we shall here merely name the
ds under *which they will be*
ard pomatums used for keeping the hair, moustache, and whiskers, in form, and sometimes to colour them at the same time, are noticed under COSMETIQUE; the mucilaginous preparations for stiffening the hair, under FIXATURE; the compounds for removing superfluous hairs, under DEPILATORY; the applications for the cure and prevention of baldness, under POMMADES and WASHES; and those employed to cleanse or beautify the hair under the last two heads, and under HAIR DYES and OILS.

HAIR DYES. *Syn.* TINCTURA CAPILLORUM, L. The practice of dyeing the hair is of great antiquity; and though not so common as formerly, it is still far from infrequent at the present day. The numerous preparations vended for this purpose have generally a basis of lead or silver. Bismuth, pyrogallic acid, and certain astringent vegetable juices, are also occasionally thus employed. The following list embraces all those of any value:—

Prep. 1. Litharge, 1 part; fresh-slaked lime and starch, of each, 2 parts; all in fine powder, and perfectly dry; mix, and keep the compound in well-corked bottles. This powder is to be made into a thin paste or cream with water (for black), or milk (for brown), and applied to the hair (previously freed from grease with soap and water, and dried), by means of a sponge or brush, or the fingers; observing to rub it well into the roots, and to pass a comb for some time through it, to ensure its coming in contact with every part. The whole must be then covered with a moist leaf of cotton wadding, or some brown paper several times doubled and well damped with hot water, and allowed to remain so for 3 or 4 hours, or even longer; or an oil-silk cap, or a bladder, may be worn, the object being simply to prevent the evaporation of the moisture. After a sufficient time has elapsed, the powder may be removed by rubbing it off with the fingers, and afterwards washing it out with warm soap-and-water. A little pomatum or hair-oil will restore the usual gloss to the hair. Another method of operating is to apply the cream or paste as before, and then to keep rubbing it about the hair with a brush as long as may be required, occasionally adding a few drops of hot water to preserve the whole moist. In this way the action of the dye is facilitated, and the process concluded in a much shorter time.

2. Lime (slaked in the air), 2 parts; carbonate of lead (pure white lead), 1 part; mixed and applied as the last.

3. (AQUA ORIENTALIS.) From grain silver, 2 drs.; steel filings, 4 drs.; nitric acid, 1 oz.; soft water, 1½ fl. oz.; digested together, the solution being afterwards diluted with water, 3½ fl. oz., and filtered. Applied by means of a fine-toothed comb, or a half-worn tooth-brush to the hair, previously well cleaned with soap *and water, and dried.*

4. (ARGENTAN TINCTURE.) From nitrate

add to this solution, dry slaked lime, 1 dr., stir well together, wash the precipitate with a [illegible] the water, then add [illegible] of [illegible] in the bottle, and shake [illegible] is fit for use. Applied [illegible]; but it acts much more quickly.

7. (Delcroix.) From acetate of lead, 2 oz.; prepared chalk, 3 oz.; quicklime, 4 oz.; each in an impalpable powder. *Used* as No. 1.

8. (EAU D'AFRIQUE—Hopekirk.)—*a.* Nitrate of silver (cryst.), 1½ dr.; distilled water, 2 fl. oz.; dissolve, and pour the solution into the bottles labelled 'Solution No. 1.' *b.* Liquor of potassa, 3 drs.; sulphydrate of ammonium, 7 drs.; water, 1 fl. oz.; mix, and pour the liquid into the bottles labelled 'Solution No. 2.' For use, the hair is moistened by means of a small-toothed comb or a tooth-brush, with the Solution No. 1, either alone or diluted with a little water; care being taken to avoid touching the skin, if possible. After the lapse of 8 or 10 minutes the Solution No. 2, diluted with at least 5 times its measure of water, is applied in the same manner, and any spots on the skin removed by rubbing them with the corner of a napkin wetted with the liquid. The skin is then sponged clean with a little warm water, and wiped dry, and the hair is arranged with the comb as usual. It is better to avoid rubbing it or washing it for a few hours. Sometimes the process is reversed, and the liquid No. 2 applied first. In this way the stains on the skin are more readily removed, but the dye is less permanent than when the other plan is adopted.

9. (EAU D'EGYPTE.) Resembles No. 4 (*above*).

10. (ESSENCE OF TYRE.) Resembles the

1 part; nitric acid, 2 part
parts; mix, and let them sta
or 5 hours, then pour them
parts; next add, lard, 3 parts
together.

b. From nitrate of silver a
tar, of each, 1 dr.; liquor of
dissolve, add of lard, 4 drs., a
gether.

18. (POUDRE D'ITALIE.)
fila's (No. 16).

19. (PYROGALLIC STAIN.)
of crude pyrogallic acid. Ar
under this name is prepar
nutgalls (coarsely powdered)
solving the solid acid which s
hot water, and after mixing t
liquid which also passes over
rectified spirit. The floating
rated and the solution filtered

20. (Redwood.) Litharge
lime and powdered starch, of e
of potassa, 2 drs.; water, q. s.
cream. *Used* as No. 1.

21. (Redwood.) Liquor of
tilled water, of each, 1 pint
sulphuretted hydrogen throug
it is saturated. Of this solut
liquor of potassa, 4 oz.; m
'Solution No. 1.' Next dis
silver, 1 dr., in distilled wa
label the liquid 'Solution No.
same manner as No. 8 & 14.

22. (Spencer's.) From sap
nitrate of silver, 1 dr.; hot w
plied as No. 3.

23. (TINCTURE OF WALN
tincture of the shells of green
with oil of lavender.

day pour off the liquid portion te sediment which forms the dye. a. 1. It is applied for 8 or 10 brown; 20 minutes, or longer, For the first, it is washed off ntaining a little common soda. nice of the bark or shell of green lied with a sponge. (Paulus

den comb used daily is said to air, but we have known persons its use for months without any change occurring. Premature frequent consequence of its use.

right to inform the reader that pounds which contain nitrate of skin as well as the hair. These removed, when quite recent, by with water containing a little ammonium (see *above*) or iodide solution; but as this is attended able and inconvenience, the best the necessity of doing so. The dopt the plan of smearing hard the skin immediately surround- o protect it from the dye. By anipulation, and the observance ions, the hair may be thoroughly the above fluids, without touch- ent skin, but this can only be ise of the hair of the head, by a . This has led to a preference y many to the compounds con- the colouring matter formed in t stain the skin. The hue given (when pale) is very apt to possess redness, but all the shades of by the preparation of silver are ceptionable. Pyrogallic acid, and walnuts, also stain the skin, al- intensely and permanently than rer.

tion of dyed hair is often a matter e in medico-legal research. The silver may be shown by digesting a little weak chlorine water or acid, when the resulting chloride y be dissolved out with liquor of nd submitted to the usual tests. ning lead, when digested in dilute gives a solution of nitrate of lead, orm it is readily detected. See SILVER.

receding compounds are for dyeing (human); horse-hair, bristles, &c., ead hair, may be readily stained by em in any of the ordinary liquid especially those employed for silk. See POMMADES, WASHES,

IARKS. The 'Hall Marks' on gold and silver not only inform us eness, but furnish us with other particulars.

Mark (proper) denotes the place *or assay, being an anchor, for* Birmingham; a dagger or 3 wheat sheaves, for Chester; Hibernia, for Dublin; castle and lion for Edinburgh; castle with 2 wings, for Exeter; tree and salmon with a ring in its mouth, for Glasgow; leopard's head, for London; 3 castles, for Newcastle-on-Tyne; a crown, for Sheffield; and five lions' heads and a cross, for York.

The Duty Mark is the head of the Sovereign, showing that the duty is paid.

The Date Mark is a letter of the alphabet, which varies every year, and with the different companies, thus: the Goldsmith's Company of London have used from 1716 to 1755 Roman capital letters; from 1756 to 1775, small Roman letters; from 1776 to 1795 old English letters; from 1796 to 1815, Roman capital letters, from A to U, omitting J; from 1816 to 1835, small Roman letters, a to u, omitting j; from 1836, old English letters.

The Standard Mark for gold is, for England, a lion passant; Edinburgh, a thistle; Glasgow, a lion rampant; Ireland, a harp crowned. For silver, a figure of Britannia. If under 22 carats, gold has the figures 18.

The Manufacturer's Mark is the initials of the maker, as S. H., W. T., C. E., &c.

HAL'OGENS. In *chemistry*, a name given by Berzelius to chlorine, bromine, iodine, and fluorine. These elements unite with metals to form compounds called 'haloid salts.'

HAMS. These are usually prepared from the legs of bacon pigs, but those of the sheep are also sometimes used for the same purpose. SMOKED HAM is strong eating, and rather fit for a relish than for diet, and should be particularly avoided by the dyspeptic and by convalescents.

Choice. A sharp knife thrust under the bone should have a pleasant smell when withdrawn. The recently cut fat should be hard and white, the lean fine-grained, and of a lively red. Those short in the hock are the best.

Curing. An ordinary sized ham requires nearly three weeks, if wet salted, and about a month if dry salted, to cure it perfectly. At the expiration of this time they are ready for smoking. MUTTON HAMS should not lie in pickle longer than 12 or 14 days.

Cooking. Hams should be put into the water cold, and should be gradually heated. A ham of 14 lbs. will take about 4 hours, one of 16 lbs. will take 4½ hours, and one of 20 lbs. about 5½ hours, to dress it properly. "If it is an old ham, it should be soaked for 12 hours previously." (Soyer.)

Pres. Most grocers and dealers in hams enclose them, after being smoked, in canvas, for the purpose of defending them from the attacks of the little insect, the *Dermestes lardarius*, which, by laying its eggs in them, soon fills them with its larvæ or maggots. This troublesome and expensive process may be altogether superseded by the use of pyroligneous acid, applied by means of a painter's brush.

HANDS. Dirty and coarse hands are no less the marks of slothfulness and low breeding, than clean and delicate hands are those of cleanliness and gentility. To promote the softness and whiteness of the skin, mild emollient soaps, or those abounding in oil, should alone be used, by which means CHAPS and CHILBLAINS will generally be avoided. The coarse, strong kinds of soap, or those abounding in alkali, should for a like reason be rejected, as they tend to render the skin rough, dry, and brittle. The immersion of the hands in alkaline lyes, or strongly acidulated water, has a like effect. When the hands are very dirty, a little good soft soap may be used with warm water, which will rapidly remove oily and greasy matter. Fruit and ink stains may be taken out by immersing the hands in water slighly acidulated with oxalic acid or a few drops of oil of vitriol, or to which a little pearlash or chloride of lime has been added; observing afterwards to well rinse them in clean water, and not to touch them with soap for some hours, as any alkaline matter will bring back the stains, after their apparent removal by all the above substances, except the last. The use of a little chloride of lime and warm water, or Gowland's lotion, imparts a delicate whiteness to the skin; but the former should be only occasionally used, and should be well washed off with a little clean water to remove its odour. Glycerine employed in the same manner renders the skin soft, white, and supple. The use of a little sand or powdered pumice stone with the soap, will generally remove the roughness of the skin frequently induced by exposure to cold. The hands may be preserved dry, for delicate work, by rubbing a little club moss (LYCOPODIUM), in fine powder, over them. A small quantity of this substance sprinkled over the surface of a basin of water will permit the hand to be plunged to the bottom of the basin without its becoming wet.

HANG'ING. In cases of suspended animation from hanging, the assistance must be prompt and energetic. The body, on its discovery, should be instantly relieved from the state of suspension and all pressure about the throat. The remedial treatment chiefly consists, in the severer cases, in cupping the temples or opening the jugular vein, and so relieving the head of the blood which is accumulated in its superficial veins in consequence of strangulation. When the body is cold, friction, and the other means used for restoring the animal heat in drowned persons, should be resorted to. See ASPHYXIA and DROWNING.

HARD'NESS. Compactness; solidity; the power of resisting abrasion. Mineral substances are frequently distinguished and identified by their relative hardness. This is ascertained by their power to scratch or be scratched by one another. A valuable table on this subject will be found in the article on GEMS.

HAR'MALINE. *Syn.* H
alkaloid, forming yellow-bro
covered in the seeds of *P*
It has a bitter astringent a
soluble in alcohol, and form
salts with the acids. It has
a yellow dye. By oxidation
compound (harmine), which i
red dye-stuff, easily prepar
The seeds are produced abund
Russia.

HAR'NESS POLISH. See

HARTS'HORN. *Syn.* C
CERVINUM, CORNU (Ph. L.),
of the *Cervus elephas*" (Ph. I

Burnt Hartshorn. *Syn.* C
L.), CORNU CERVI USTUM, L
1836.) Burn pieces of harts
fectly white, then grind and
the same way as directed for

Obs. Finely powdered bo
sold for burnt hartshorn, and
the same properties. *Dose.*
more, 2 or 3 times a day, in r

Hartshorn Shavings. *Sy*
RASPINGS; RASURA CORNU
C. C., L. Obtained from the
in water, it yields a nutritive
straw-plait workers to stiffen

HATCH'ING. See INCUBA

HATS. Those should be
a short, smooth, fine nap, a
colour; and sufficiently elast
nary wear and tear, without b
way. The HAT BRUSH for da
made of soft hairs, but a stiff
employed occasionally, to lay
and close. Grease may be re
of porous brown paper, and
hot iron.

HEAD'ACHE. *Syn.* CEPHA
pathology, pain in the head.
this very general complaint ar
to require any description. A
thologists, headache arises eit
pathy with the stomach and ch
forming) viscera, or from a
haustion of the power of the e
former may be called SYMPATH
and the latter NERVOUS HEAD
attacks only one side of the
HEMICRANIA. The treatme
form should consist in resto
action of the stomach, by th
of aperients, and by the use
and exercise; or when that
loaded with undigested food, b
of an emetic. For this purp
of ipecacuanha wine may be t
of warm water, which will g
the stomach, especially if its a
by drinking copiously of warm
ache is a common accompanim
tion and stomach disease, an
will be found that whatever
one will also cure the othe

ved by nervous tonics and sti-
k, cascarilla, calumba, and gen-
, ammonia, ether, and wine, the
ate of considerable dilution. A
coffee or strong green tea often
rm in removing this species of
nall doses of tincture of henbane
n a like effect. 20 or 30 drops
or, preferably, half that number
sedativus, may be taken with
an anodyne, and to induce sleep.
ular remedies may be mentioned
ants,' as snuff (cephalic), smelling
omatic vinegar, the use of which
every one; and local applications,
water, ether, vinegar, strong
gne water, &c., all of which are
the part of the head affected,
gers, or a linen rag dipped in them
on instead. Pressure on the head
n used with advantage. Silence,
d repose, are powerful remedies,
le to every variety of headache;
of air, scene, and occupation, are
neficial to those resulting from ex-
tal anxiety or exertion. Blisters
vely applied behind the ears in
dent headache.

is often symptomatic of other dis-
cially those of the inflammatory
s kind, rheumatism, &c. In all
primary disease should be sought
ttempted to be cured. In many
attacks rapidly yield to a few doses
nd decoction of sarsaparilla con-
little iodide of potassium. Head-
egnancy may generally be removed
attention to the bowels; observing
heir action, should they require it,
of some mild aperient, as castor oil,
ectuary, seidlitz powders, &c. When
itution is very robust, blood may be
leadache in bed may frequently be
y washing the head with cold water,
ntinuing the use of a nightcap, at
time preserving the feet warm by
worsted socks or stockings.

ING. *Syn.* BEER HEADING, CAULI-
E. *Prep.* 1. Alum and green cop-
al parts, in fine powder.
n, copperas, and common salt, equal

by brewers to make their beer keep
or froth.

TH. That state of the living body
all its functions are duly performed.
ISE.

ING. See DEAFNESS, EAR, &c.

TBURN. *Syn.* CARDIALGIA, L.
nd pain about the region of the sto-
nerally attended by a sense of gnawing
t; hence its popular name. Faint-
ess, and eructation of a thin, acidu-
ry liquid, especially in the morning,
symptoms of this complaint.
causes of heartburn are excess in eating and drinking, the use of improper food, and sedentary habits. A good remedy is a teaspoonful of carbonate of magnesia, or carbonate of soda, in a glass of peppermint or cinnamon water, to which a little powdered ginger may be added with advantage. This dose may be taken 2 or 3 times daily until the disease is removed. Articles of food that easily undergo fermentation should at the same time be avoided, and a dry diet had recourse to as much as possible. Soda water, toast-and-water, and weak spirit-and-water, are the most suitable beverages in this complaint.

HEAT. *Syn.* CALORIC; CALORICUM, L. The consideration of this subject belongs to physics and chemistry. Much useful information, in connection with it, will, however, be found in this work under the heads EBULLITION, EVAPORATION, EXPANSION, REFRIGERATION, &c.

HEAVY SPAR. Native sulphate of barium See BARYTA.

HED'ERIN. *Syn.* HEDERINA, L. From the decoction of the ground seeds of ivy (*Hedera helix*), boiled in water, along with a little slaked lime or magnesia, the precipitate being afterwards digested in rectified spirit, and the filtered tincture evaporated. Febrifuge and sudorific.

HEL'ENIN. See INULIN.

HELIOG'RAPHY. See PHOTOGRAPHY.

HEL'LEBORE. *Syn.* BLACK HELLEBORE; HELLEBORUS (Ph. L.), L. "The rhizome and root" of "*Helleborus niger*" (Ph. L.) or black hellebore. It is alterative and emmenagogue, in small doses (2 to 8 grs.); and a drastic hydragogue purgative and anthelmintic in larger ones (10 to 20 grs.). See WHITE HELLEBORE.

HELLEBOR'IN. *Syn.* SOFT RESIN OF HELLEBORE. An odourless, acrid substance, extracted by alcohol from black hellebore, and on which, according to Vauquelin, the activity of that drug depends.

HEM'LOCK. *Syn.* CONII FOLIA (B. P.); CONIUM (Ph. L. E. & D.), L. In *pharmacy*, "the fresh and dried leaf of the wild herb *Conium maculatum*," or spotted hemlock. The first is used to make the extract; the last, the tincture and powder.

Hemlock is a powerful narcotic acrid poison, occasioning stupor, delirium, paralysis, convulsions, coma, and death. In small doses it is anodyne, alterative, resolvent, antispasmodic, and anaphrodisiac, and has been exhibited in cancer, dropsy, epilepsy, rheumatism, scrofula, syphilis, and other diseases.—*Dose.* 3 or 4 grs. of the powder, twice or thrice daily, until some obvious effect is produced.

Hemlock, whether in leaf (conii folia) or powder (pulvis conii) rapidly deteriorates by keeping. When good, the powder, triturated with solution of potassa, exhales a powerful odour of conia.

In cases of poisoning by hemlock, the treatment is similar to that noticed under ACONITE. See CONINE, EXTRACT, TINCTURE, &c.

HEMP. *Syn.* CANNABIS, L. In *botany* the typical genus of the natural order *Cannabinaceæ*. The common hemp, from the fibres of which cordage is made, is the species *Cannabis sativa*. The fruit of this plant (hemp seed) is demulcent and oleaginous. It is said that the plumage of bullfinches and goldfinches fed on it for too long a time, or in too large a quantity, changes from red and yellow to black.[1]

Hemp, Indian. *Syn.* HASHISH, CANNABIS INDICA. This plant, now so largely used in medicine, is a variety of *Cannabis sativa*, or, perhaps, the same simply rendered more active by climate. The parts employed in Asia for the purposes of intoxication, and in Europe as medicine, are the herb or leaves and the resin. The 'gunjah' sold in the bazaars in the East Indies is the plant, just after flowering, dried, and pressed together. Bang,' 'bhang,' 'subjee,' or 'sidhee,' consists of the larger leaves and capsules without the stalk. The concrete resinous exudation from the leaves, stems, and flowers, is called 'churrus,' and in this country 'resin of Indian hemp.' 'Hashish' seems to be a general term for the preparation of hemp.

Indian hemp is anæsthetic, anodyne, exhilarant, antispasmodic, hypnotic, and narcotic. In the East it is commonly used as an intoxicant, either by smoking it, like tobacco, or swallowing it. The inebriation produced by it is of an agreeable or cheerful character, exciting the party under its influence to laugh, dance, sing, and to commit various extravagancies. It also acts as an aphrodisiac, augments the appetite for food, and, in some cases, occasions a kind of reverie and catalepsy. In this country its action is less marked. It has here been chiefly administered under the form of alcoholic or resinous extract. See EXTRACT OF INDIAN HEMP.

HEN'BANE. *Syn.* HYOSCYAMI FOLIA (B. P.); HYOSCYAMUS (Ph. L. E. & D.), L. In *pharmacy*, "the fresh and dried stalk-leaf of the biennial herb, *Hyoscyamus niger*" (Ph. L.), or common biennial or black henbane. The first is used for preparing the extract; the last, for the powder and tincture.

Henbane is anodyne, hypnotic, antispasmodic, and sedative. It differs from opium in not being stimulant, and by not confining the bowels; and hence may be administered in cases in which that drug would be improper. In large doses it acts as a powerful narcotic poison, producing obscurity of vision, dilation of the pupils, delirium, phantasms, coma, &c. —*Dose.* 3 to 10 grs., in powder. It is usually given in the form of extract or tincture. The antidotes, &c., are the same as those noticed under OPIUM.

HE'PAR. *Syn.* LIVER. A name given by the older chemists to various combinations of
sulphur, from their brownish
as '*hepar antimonii*,' '*hepar*
See ANTIMONY (Liver of), P
phuret), &c.

HERBAR'IUM. [Eng., L.]
SICCUS, L. A collection of
of plants; hence called HORTU
garden. Plants for the herb
gathered on a dry day, and ca
tin-box ('VASCULUM'), or ot
receptacle which will preserve
a time. Those which have co
in their leaves should be allow
stalks being placed in water
alive. Plants with very thick,
or stems must be killed by in
water before they can be safe
drying press. The press con
a few stout boards with a
better, a number of heavy wei
stones—for pressing them toge
cimens of plants, when all sup
has been removed, are placed
of bibulous paper (BOTANICA
being taken that the parts
ranged in a natural manner.
taining the specimens are then
the boards, and pressure is
must be very gentle at first,
gradually increased as the pla
The paper is changed every
second day, and the damp shee
use at a future time. When
the specimens are placed on sh
paper, and fixed by a few stitc
little gum, or strips of gumn
name of the genus and spec
cality where found, &c., are
beside each. Camphor or a
sublimate may be used to pr
from the ravages of insects.
of an herbarium offers an almo
of amusement to the ingeni
specimens so collected, if wel
almost as useful to the botani
plants.

HERBS. *Syn.* HERBÆ, L.
and drying of herbs for medici
perfumery are noticed under V
STANCES.

Amongst cooks, several
either fresh or dried, are use
"In many receipts is mentio
sweet herbs, which consists,
and soups, of a small bunch
sprigs of thyme, and one bayle
then of four sprigs of winte
thyme, and one bayleaf." (So

HER'NIA. See RUPTURE.

HER'RING. A well-know
belonging to the family of *Cl*
of the order *Malacopterygii*.
food, herrings are of a vast
large proportion of the popul
When recently caught and dr
or boiling, they are wholeso

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[1] Burnett, 'Outlines of Botany.'

; kept, they become strong hen apt to offend the sto- ration of salted and dried gs (bloaters, red herrings) ient for thousands, both in l Holland. Real Yarmouth ch herrings are highly es- s a relish. Salted herrings diuretic. The pickle was clysters, dropsies, &c. M. h "the poor man's friend," :, after being "cleaned and ead removed," it should be ack, and the gut taken out." ay to ascertain if a herring is e the fish in the left hand, w of the fins from the back, . You may thus find out the ar. This plan is adopted by "

'. A peculiar substance ob- white portion of the rind of , &c. It forms crystalline odourless, tasteless, fusible, ol and ether, less soluble in

hik'-ŭp). *Syn.* Hiccup; Sin- convulsive motion of the parts adjacent. The common lency, indigestion, acidity, and y generally be removed by the arm carminatives, cordials, cold irits, camphor julep, or spirits A sudden fright or surprise uce the like effect. An instance a delicate young lady that was hiccough for some months, and ced to a state of extreme de- e loss of sleep occasioned by it, d by a fright, after medicines plications had failed. A pinch ss of iced soda water, or an ice- so frequently remove this affec-

'CRA. See Powder of Aloes

IS. An aromatic medicated wine, ch used in England, and still the Continent.

bon and Canary wine, of each, 12 non, 2 oz.; white canella, ½ oz.; nutmeg, ginger, and galangal, or f each, 1 dr.; bruise the spices, em in the wine for three or four , and add of lump sugar, 2½ lbs.

C ACID. $HC_9H_8NO_3$. *Syn.* Aci- icum, L. A compound discovered the urine of the horse, cow, and ivora, in which it exists as hippu- sium or sodium.

ncentrate fresh cow's urine by a o about $\frac{1}{10}$th its bulk, filter from the liquid with excess of hydro- , and set it aside to crystallise. decoloured *by redissolving it in* s *and treating it with animal* charcoal, or with a little chloride of lime along with some hydrochloric acid, and re-crystallising it.

Obs. Hippuric acid, when pure, forms long, slender, milk-white, square prisms; it is soluble in 400 parts of cold water; it also dissolves in hot alcohol. When strongly heated, it yields benzoic acid, benzoate of ammonia, and benzonitrile, with a coaly residue. The urine of horses or cows, left to itself for some time, or evaporated at a boiling temperature, yields not a trace of hippuric acid, but only benzoic acid. Nitric acid and hot oil of vitriol convert it into benzoic acid. Boiling hydrochloric acid converts it into benzoic acid and glycocoll. With the bases it forms salts, which are called hippurates. See Benzoic Acid.

HIPS. *Syn.* Heps; Rosa canina (Ph. L.). The fresh fruit of the dog rose (*Rosa canina*), or wild briar. *Used* to make a conserve.

HOL'LANDS. *Syn.* Geneva, Schiedam, Hollands gin, Dutch g. *Prep.* 1. The materials employed in the distilleries of Schiedam, in the preparation of this excellent spirit, are 2 parts of the best unmalted rye and 1 part of malted bigg, reduced to the state of coarse meal by grinding. About a barrel (36 galls.) of water, at a temperature of from 162° to 168° Fahr., is put into the mash-tun for every 1¼ cwt. of meal, after which the malt is introduced and stirred, and, lastly, the rye is added. Powerful agitation is next given to the magma till it becomes quite uniform, when the mash-tun is covered over with canvas, and left in this state for two hours. Agitation is then again had recourse to, and the transparent 'spent wash' of a preceding mashing is added, followed by as much cold water as will reduce the temperature of the whole to about 85° Fahr. The gravity of the wort at this point varies from 33 to 38 lbs. A quantity of the best pressed Flanders yeast, equal to 1 lb. for every 100 galls. of the mashed materials, is next stirred in, and the whole is fermented in the mash-tun for about 3 days, or until the attenuation is from 7 to 4 lbs. (sp. gr. 1·007 to 1·004). During this time the yeast is occasionally skimmed off the fermenting wort. The wash, with the grains, is then transferred to the still, and converted into 'low wines.' To every 100 galls. of this liquor, 2 lbs. of juniper berries (3 to 5 years old), and about 1 lb. of salt, are added, and the whole is put into the low-wine still, and the fine spirit drawn off by a gentle heat, one receiver only being employed. The product per quarter varies from 18 to 21 galls. of spirit, 2 to 3 o. p.

2. (Best Hollands.) Hollands rectified to the strength of 24° Baumé (sp. gr. ·9125, or about 6 o. p.).

3. (English-made.)—*a.* From juniper berries (at least a year old, and crushed in the *hands), 3 lbs.;* rectified spirit, 1¼ gall. (or *proof spirit, 2½ galls.*); digest, with agitation,

for a week, and then express the liquor; after 24 hours' repose, decant the clear portion, add it to good corn spirit, at 2 or 3⅝ overproof, 90 or 100 galls., and mix them well together.

b. From juniper berries, 2¼ lbs.; sweet fennel seed, 5 oz.; caraway seed, 3½ oz.; proof spirit, 2 galls.; corn spirit, 90 or 100 galls.

c. As the last, with the addition of Strasburg turpentine or Canadian balsam, 1 lb.

d. To either of the last two or three, add a very small quantity of ground cardamoms or horse-radish. Some compounders also add 4 or 5 cloves of garlic, or about 15 grs. of assafœtida, with 1 gr. of ambergris rubbed to a powder with a little white sand or lump sugar. Good plain gin may be advantageously employed in lieu of the corn spirit ordered above, when expense is no object.

Obs. The last four forms, which are only given as examples, produce a very pleasant spirit, if it is kept for some time to 'mellow.' Age is one of the principal causes of the 'creaminess' of foreign gin, which usually lies in bond for some time before being consumed. The product is, however, much superior if the ingredients are rectified along with 20 galls. of water, and about 14 lbs. of salt, by a gentle heat.

It will be seen from the above that the superior flavour of Hollands spirit depends more on the peculiar mode of its manufacture than on the quantity of juniper berries employed; 2 lbs. of them, when new, being barely equivalent to 1 oz. of the essential oil; and when old, to less than ½ oz., a quantity wholly insufficient to flavour 100 gallons of spirit. The Dutch distillers, most noted for this liquor, add a little pure Strasburg turpentine and a handful or two of hops to the spirit, along with the juniper berries, before rectification. The former substance has a pale yellowish-brown colour, and a very fragrant and agreeable smell, and tends materially to impart that fine aroma for which the best geneva is distinguished. At Rotterdam sweet fennel seed is commonly added as a flavouring; and at Weesoppe Strasburg turpentine and fennel seeds, or the essential oil of fennel, are frequently substituted for a large portion of the juniper berries.

Schiedam Hollands is considered the best; the next quality is that of Rotterdam; after these comes that of Weesoppe.

Attempts have been made by Mr. Robert Moore, and others, to introduce into general consumption in this country a home-made liquor, resembling and prepared in the same manner as foreign geneva, "but the palates of our gin-drinkers were too corrupted to relish so pure a spirit."

HOMŒOP'ATHY. *Syn.* Homœopathia, L. A medical hypothesis promulgated at the commencement of the present century by the late Dr. Hahnemann, of Leipsic, according to which diseases may be cured by the administration of minute doses of medicines capable
of producing in healthy pers
similar to those it is intende
The doctrine that "*similia simil*
had long previously been practi
to a limited extent, in certain c
mate medicine (allopathy, het
though not verbally recognised
to its system. The administra
tesimal doses is an absurdity
pathy, however, alone can clai
to this method, the millionth
often an excessive dose; whilst
decillionths, quantities so small
beyond human perception, form
doses. This reduces the whol
homœopathy to a system of
beyond regulating the diet and
patient. "All judicious pract
long been agreed that there a
which are best treated in the
mentioned, and in which phys
harm than good; in which, in
sible physician endeavours to a
tient, whilst nature cures the
that the frequent success of
treatment may be explained, with
the principle upon which it is pr
founded." (Brande.)

HON'EY. *Syn.* Mel (B. P.),
substance elaborated by the dome
the juices of the nectaries of
deposited in the cells of wax formi
comb.

Var. Pure honey consists of
uncrystallisable sugar and cry
charine grains, resembling gra
'Virgin honey' is that which f
neously from the comb.—'Ordi
that obtained by heat and pre
former is pale and fragrant; the
and possessing a less agreeabl
smell.—'English honey' is chie
from furze and broom flowers,
waxy than that from the South o
'Narbonne honey,' chiefly from ro
other labiate flowers, very fine;—
honey' is found near Trebizond, in

Pur. Honey is frequently adul
treacle, potato-sugar syrup, pot
starch, and wheat flour. The fi
detected by the colour and odour;
in the way noticed under Suga
others by the honey not forming a
solution with cold water, and stri
colour with iodine. When it con
flour, and is heated, it at first lique
cooling it becomes solid and tough
sence of starchy matter or flou
proved by the following test:—
water for five minutes, and allowe
should not become blue with iodi
indicating absence of flour.

Uses, &c. Honey is nutritive an
but rather apt to gripe. It is
the preparation of oxymels and
and also to cover the taste of

loes better than sugar. Clarified
ordered to be used in medicine.
'ified. *Syn.* REFINED HONEY,
; MEL DEPURATUM (Ph. D.),
TUM, L. The honey is simply
e heat of a water bath, and
: hot through flannel (Ph. D.);
d as last, and the scum removed
r—it is melted with 1-3rd its
ter, skimmed, strained through
vaporated until it reaches the
(P. Cod.) Honey is not to be
out being despumated. (Ph. L.)
fied honey is less agreeable than
nd has lost the crystalline cha-
latter; but it is less liable to
gripe. The use of copper and
implements should be avoided,
uires a dark colour by contact
Berlin-ware, stone-ware, or well-
n copper pans, should alone be
large scale, one or other of the
s are adopted:—
y is mixed with an equal weight
allowed to boil up 5 or 6 times
ming; it is then removed from
after being cooled, brought on
linen strainers, stretched hori-
covered with a layer of clean
ed sand, an inch in depth; the
with a little cold water, and the
is finally evaporated to the thick-

e the honey in water, as last,
white of egg, and evaporate to a
tence.
e in water, add 1½ lb. of animal
every ¼ cwt. of honey, gently
5 minutes, add a little chalk to
ss of acid, if required, strain or
vaporate.
l cwt.; water, 9 galls.; fresh burnt
al, 7 lbs.; simmer for 15 minutes,
chalk to saturate free acid (if re-
n or clarify, and evaporate as before.
(In *pharmacy.*) *Syn.* MELLITA,
re minor preparations, now almost
by 'syrups' (SYRUPI). The *mel-*
Ph. L., including two 'oxymels,'
r in number.
f Bo''rax. *Syn.* MEL BORACIS
, L. E. & D.), L. *Prep.* (B. P.)
dered borax, 1; clarified honey, 7;
ingent, detersive, and cooling. It
d in aphthæ of the mouth, ex-
iation, &c. A great improvement
o dissolve 1 of borax in 1 of glyce-
en add 6 of honey.
f Col'chicum. *Syn.* MEL COLCHICI,
(Beasley.) Dried colchicum, 1
r (at 140°), 16 parts; infuse for 12
in, let it settle, and boil the clear
h white honey, 12 parts, to the con-
f a syrup. See COLCHICUM.
f Liq'uorice. *Syn.* MEL GLYCYRRHI-
Prep. (*Ph. Hamb.*) *Honey and* a strong infusion of liquorice boiled to a proper consistence. Emollient, pectoral, and laxative.

Honey of Male Fern. *Syn.* MEL FILICIS, L. *Prep.* (Dunglison.) Ethereal extract of male fern, 30 grs.; honey of roses, 4 drs.; mix. In tape-worm.—*Dose.* One half at bed-time, followed by the remainder in the morning.

Honey of Mercury. *Syn.* MEL HYDRARGYRI, L. *Prep.* (Bell.) Mercury, 1 dr.; honey, 1 oz.; triturate till the globules disappear. Allard adds of oil of cloves, ½ dr. Properties similar to those of mercurial pill. It is chiefly used as an application to ulcers of the throat.

Honey of Ro''ses. *Syn.* MEL ROSÆ (Ph. L. & E.), L. *Prep.* 1. (Ph. L.) Dried petals of the red rose (the leaves separated), 4 oz.; boiling water, 16 fl. oz.; macerate for 2 hours, lightly press them in the hand, and strain; then add 8 fl. oz. more of boiling water to the roses, macerate for a short time, and again gently express the liquor; to this add half of the first infusion, and set aside the other half; next add to the mixed liquors, honey, 5 lbs., and evaporate in a water bath, so that, the infusion which was set aside being added, it may become of a proper consistence.

2. (Ph. E.) Dried rose petals, 4 oz.; boiling water, 2½ pints; infuse for 6 hours, and gently squeeze out the liquor; after the impurities have subsided, decant the clear, add of honey, 5 lbs., and evaporate, as before, to a proper consistence, removing the scum which forms. *Used* to make astringent gargles. It must not be boiled in a copper or iron vessel, as they will spoil the colour. The last form is that commonly adopted in trade.

Honey of Squills. *Syn.* MEL SCILLÆ, L. *Prep.* 1. Thick clarified honey, 3 lbs.; tincture of squills, 2 lbs.; mix.

2. (Soubeiran.) Dried squills, 1 oz.; boiling water, ¾ pint; infuse 2 hours, strain, add of honey, 12 oz., and evaporate to a proper consistence. Resembles OXYMEL OF SQUILLS (nearly).

Honey of Vi'olets. *Syn.* MEL VIOLÆ, L. *Prep.* From clarified honey, 2 parts; expressed and depurated juice of violets, 1 part. Resembles syrup of violets.

HON'EY DEW. *Syn.* ROS MELLITUS, L. A sweetish matter ejected upon the leaves of plants by certain aphides.

HOOP'ING COUGH. See WHOOPING COUGH.

HOPS. *Syn.* LUPULUS (B. P.), L. "The catkins of the female plant of the *Humulus lupulus*" or common hop. (B. P.) "The dried strobiles." (Ph. D.) The hops of commerce are the strobiles or catkins (LUPULI STROBILI, L. AMENTA) of the hop plant. The yellow powder or small lupulinic grains or glands (LUPULIN), which are attached to the strobiles, are the portion on which their characteristic qualities chiefly depend.

The hop is tonic, stomachic, and moderately narcotic. It is used in diseases of local debility with morbid vigilance and other nervous ments, and sticks, and which, when rubbed between the hands, impart, in the greatest degree, a yellowish tint and glutinous feeling to the skin. The tightness with which they are packed should also be noticed; as, without being very firmly pressed together, and quite solid, they soon spoil by keeping. The finest flavoured hops are the 'GOLDINGS,' grown chiefly in middle and east Kent; the 'WHITEBINES' of Farnham and Canterbury; and the WORCESTER HOPS, grown on the red soils of the vale of the Severn. These are principally employed for the finer class of ales. Mid Kent and Sussex hops are also used for ale, but have an inferior colour and flavour. The best hops are packed in sacks of fine canvas, termed 'pockets,' weighing from 1¼ cwt. to 1¾ cwt. each; and the inferior qualities, in coarse 'bags,' of about double this size. The former are mostly purchased by the ale brewers, and the latter by the porter brewers. When hops are older than of the last season's growth, they are termed 'yearlings,'—when of the second season's growth, 'olds,'—and when three years, or older, 'old olds.' See BREWING, EXTRACT, HUMULIN, LUPULIN, TINCTURE, &c.

HOREHOUND. *Syn.* WHITE HOREHOUND; MARRUBIUM VULGARE (Linn.), L. This herb has long been a popular remedy in chronic pulmonary complaints, especially catarrh, and in uterine and liver affections. Horehound tea (THEA MARRUBII, INFUSUM MARRUBII) is prepared by infusing 1 oz. of the herb in boiling water, 1 pint, for an hour;—syrup of horehound (SYRUPUS MARRUBII), by thickening the infusion or tea with sugar;—candied horehound (MARRUBIUM CONDITUM), by mixing 1 pint of horehound juice with 8 or 10 lbs. of white

contact under strong pres
the whole thus arranged to
water.

Horn is stained or party-
tortoise-shell, by a solutio
gold, for the red portion;
for the dark brown and
of mercury (hot), or a paste
and potash or quicklime, for
the last is used, the horn
exposed to its action for som

HORS-D'ŒUVRES. [Fr.]
Fr. Small *entrées*, as '*aigu*
plates of sardines, anchovies
served at dinner between
'*Assiettes volantes*' (flying
handed round to the guests,
the table.

HORSE. *Syn.* EQUUS, L.
quadruped belongs to the f
tinguished by a single digit
foot. The horse can scarce
at the present day in its
as the so-called 'wild-hors
Asia are but the progeny
have escaped from the han
Of all animals the horse
man. Independently of its
of burden and draught, its
testines, and bones, furnish
thongs of whips, gut, greas
nure, &c. The excrement,
included in the Materia Me
1618. The flesh is eaten
and was formerly esteeme
virtues.

Injuries of a serious ch
death, are often occasioned

'ER. This term was first em-
es Watt, to express a power
ng 33,000 lbs. one foot high per
effective pressure on the surface
was estimated at 7 lbs. to the
nd hence the area of the piston,
hes, multiplied by 7, gave the
moving pressure, and the space
this piston in a minute gave the
gh which the pressure was ex-
weight was raised. From these
se-power was easily calculated.
time improvements in the for-
ilers and steam engines increased
pressure on the piston, and, conse-
power of the engine. In modern
ctual power is commonly from 2
greater than the nominal power,
wever, still retained as the unit of
mmercial calculations.

D'ISH. *Syn.* ARMORACIA RADIX
The fresh root of *Cochlearia Armo-*
P.) Horseradish is pungent, acrid,
nd rubefacient. It is also regarded
tic, diuretic, and antiscorbutic. It
ful masticatory in hoarseness, sore
toothache. As a condiment, it
he appetite and assists digestion.
shreds (scraped horseradish), it
mmon and excellent accompaniment
ef. The root of aconite or wolfsbane,
ewhat resembles it in appearance,
nally been mistaken for it, with
lts; the two are, however, readily
hed from each other, as the taste of
h is warm and pungent, approach-
f mustard, whilst aconite is bitter,
lour is earthy and disagreeable, and
w minutes' contact with the lips,
nd fauces, produces a sensation of
and tingling. The root may be kept
some time, if buried in sand in a
Horseradish powder is prepared
roots gathered in November or
, and dried by a gentle heat or ex-
a current of dry air. It is used as a

CULTURE. *Syn.* GARDENING. The
ltivating gardens. According to
orticulture differs from agriculture,
the comparatively limited space over
xtends, and in being conducted by
bour; whilst the latter is performed
human and animal labour, in fields,
tensive tract of land called a farm.

S-SICCUS. See HERBARIUM.

AL GAN'GRENE. *Syn.* PHAGE-
NGRENOSA, L. A species of ulcer-
tification, particularly characterised
ectious nature, and its tendency to
unds and ulcers in crowded hospitals,
ften the most trifling operation can-
erformed with safety. Under its
the parts are rapidly destroyed, not
mation of ordinary sloughs, as in
mortification, but by their conversion
into an ash-coloured viscid substance interspersed with bloody specks. The treatment is similar to that noticed under MORTIFICATION, but here, above all things, thorough ventilation must be established, and persevered in, and, when possible, change of situation sought.

HUILE. [Fr.] Oil; a term applied to various substances and preparations on account of their smoothness, consistence, or real or imaginary emollient or oleaginous nature. See LIQUEUR, OIL, &c.

Huile Acoustique. *Prep.* From garlic and bay leaves, of each, ½ oz.; olive oil, ½ lb.; boiled together for 15 minutes, and strained. Used in ear-ache and deafness. A little is dropped on cotton wool and placed in the ear.

Huile Antique. See OILS (Hair).

Huile Liqueureuse. *Prep.* 1. (DE LA ROSE.) From eau de rose, 1 part; simple syrup, 2 parts; mixed together.

2. (DES FLEURS D'ORANGES.) From orange-flower water and syrup, as No. 1.

3. (DE VANILLE.) From essence of vanilla, 1 dr.; simple syrup, 1 pint.

Obs. The above are kept in small decanters, and used to flavour water, grog, liqueurs, &c., instead of sugar or capillaire; also to perfume the breath. Other flavoured syrups, for the same purposes, are prepared in a similar manner.

HU'MIC ACID. *Syn.* ULMIC ACID. See HUMUS.

HU'MULIN. The name given to a beautiful extract or essence of hops, made as follows:—

A concentrated tincture of hops is prepared by 'percolation' with rectified spirit; the same hops are then exhausted with water; the spirit is removed from the tincture by careful distillation, and the upper aqueous portion is skimmed off, and added to the infusion, which latter is then evaporated to the consistence of a soft extract; the oleo-resinous residuum of the tincture is next added, and well mixed in; after which the whole is put into pots and carefully tied over for sale. The product possesses all the fragrant, tonic, and bitter qualities of the hop in a highly condensed form. See HOPS, LUPULIN, &c.

HU'MUS. *Syn.* ULMIN. When wood, or woody fibre, is exposed to the joint action of air and moisture, it suffers eremacausis or decay, and crumbles down into a dark-brown or black powder, commonly called 'mould,' and to which chemists have given the name of 'humus.' In this state it exists in fertile soils, in which it is derived from the decay of plants. A powder of similar composition is produced by the action of powerful chemical reagents on sugar, lignin, &c. When acted upon by dilute boiling solution of caustic potassa, this substance yields a deep-brown solution, from which acids precipitate a flocculent brown substance generally called 'ulmic' or '*humic acid*.' Both bodies require further investigation, as they are supposed to vary exceedingly in composition.

HUNGER. The peculiar sensation arising from the want of food. When severe, it increases to actual pain, the coats of the stomach are acted on by its own juices, the respiration becomes less frequent, the circulation languid, and there is a general diminution of the heat of the body and of the secretions. The return of hunger is accelerated by exercise and labour, and by the exposure of the body to a low temperature. Long fasting is injurious, more particularly to the young and the debilitated. See APPETITE, NUTRITION, &c.

HUS'BANDRY. The business of the farmer; by some the term is restricted to the joint operations of farming and gardening on the small scale. It is also sometimes used synonymously with agriculture.

HY'ACINTH. In *botany*, the English name for the genus *Hyacinthus*. There are numerous varieties of the garden hyacinth, all very beautiful. The bulbs are largely imported from Holland, and are often grown in water contained in suitable glass vessels (hyacinth glasses). In *mineralogy*, the term is applied to crystallised yellow or brown zircon. See GEMS.

HYDRAC'IDS. *Syn.* HYDROGEN ACIDS. A name formerly given to those acids which do not contain oxygen, as hydrochloric, &c. It is still occasionally employed.

HY'DRAGOGUES. *Syn.* HYDRAGOGA, L. Medicines which cause the removal of water from any of the cavities of the body. Many cathartics, as gamboge, jalap, &c., are classed under this head.

HYDRAS'TIN. The name given to a concentrated remedy much employed by the medical eclectics of America.

Prep. Treat the powdered root of golden-seal (*Hydrastis Canadensis*) with cold water by percolation; acidulate the infusion with hydrochloric acid; collect the precipitate on a filter; then dry it, dissolve the dried mass in alcohol, filter, and set aside to crystallise.

Prop. Yellow, acicular crystals, insoluble in cold alcohol, ether, and water.—*Dose.* 3 to 5 grs., 3 to 6 times a day; as a tonic in dyspepsia, inflammation of the stomach, &c.—*Obs.* According to the most recent investigations, hydrastin contains berberine, and another alkaloid, called hydrastia or hydrastina.

HY'DRATES. Compounds of hydroxyl (HO) with other bodies, *e. g.* KHO—hydrate of potassium. The term hydrate is also given to chemical combinations of water (H_2O) with other substances, *e.g.* $C_2HCl_3O \cdot H_2O$—hydrate of chloral.

HY'DRIDE. A compound of hydrogen with another radical, *e. g.* hydride of methyl—CH_3H.

HYDRI'ODATE. A name used occasionally as synonymous with iodide. See IODIDES.

HYDRIO'DIC ACID *Syn.* IODH
ACIDUM HYDRIODICUM, L. An
pound of iodine and hydrogen
DINE.

HYDRO'BENZAMIDE. White
mass, obtained from oil of bitter
treatment with ammonia.

HYDROBRO'MIDE. *Syn.* BRO
see).

HYDROBRO'MIC ACID. See B

HYDROCAR'BON. Compound o
hydrogen. The hydrocarbons const
important series of organic com
though the term strictly embrace
pound composed solely of carbon a
it is usually restricted to compou
the carbon and hydrogen bear
portions to each other, and usu
two.

HYDROCHLO''RATE. See CHI

HYDROCHLO''RIC ACID. See

HYDROCHLO''RIC ETHER. S

HYDROCY''ANATE. See CYAN

HYDROCYAN''IC ACID. See C

HYDROCHLOR'IC ACID. See C

HYDROCHLOR'IC ETHER. Se

HYDROCYAN'IC ACID. See C

HYDROFLUOR'IC ACID. See I

HYDROFLUOSILIC'IC ACID.
FLUORIDE OF SILICON AND HYDRO
From powdered fluor spar, and si
or powdered glass, of each, 1 pa
trated sulphuric acid, 2 parts; mi
retort, apply a gentle heat, an
evolved gas (fluoride of silicon)
Decomposition ensues, silica bei
in a gelatinous state, and hydroflu
remaining in solution. This
which is a double fluoride of silico
gen, is used as a test for barium
sium, with which it forms nearly i
cipitates.

HY'DROGEN. H. *Syn.* HY
L. An elementary body discovere
dish, in 1766. It has been found
an uncombined state in the gases
the solfataras of Iceland. Com
oxygen, it constitutes water, and i
is extensively distributed through
and ocean. It is an important co
all organised tissues.

Prep. Hydrogen is always o
experimental purposes by the
of water, by one or other of th
methods:—

1. A tube of iron or porcelain (a
for instance) containing a quan
turnings or scraps of iron, is fixed
nace, so that its middle portion m
red-hot; to the one end is attac
or other vessel containing water,
other a bent tube connected with
trough or gasometer. The tube
heated to redness, and the water i
brought into a state of brisk eb
evolved steam suffers decompo

orbed by the iron, and the
into the gas receiver.

cid (oil of vitriol), diluted
its bulk of water, is poured
c (or scraps of iron), placed
bottle; hydrogen is evolved
s before.

e most convenient method of
gen, and the one usually
boratory. To ensure the gas
, distilled zinc is employed,
ssed, first through a concen-
f pure potassa, then through
itrate of silver, and, lastly,
il of vitriol or over fragments
calcium. When hydrogen is
rude zinc, it has a slight smell;
iron, its odour is often strong

s; colourless; tasteless; odour-
; combustible; sp. gr. ·06935,
lighter than oxygen gas, and
er than atmospheric air. 100
60° Fahr. and 30 inches of
weigh 2·1371 (say 2·14) grs.;
6·6 inches. It is very readily
by a red-hot wire. It burns
y visible flame. Mixed with
r or oxygen, it explodes with
e on the approach of flame, or
sion. One measure of hydro-
tmospheric air, and 2 of hydro-
xygen, are the proportions that
he greatest violence. The com-
rogen and oxygen, when mixed,
ut by the heat of a red-hot solid
the electric spark, and by the
ongy platinum, the black powder
clean platinum foil, and some
ces. A jet of hydrogen burnt in
or a jet of these gases (mixed)
air, with proper precautions, pro-
t intense heat. Water absorbs
olume of hydrogen.

is recognised by—its combusti-
pale colour of its flame;—produc-
ly when burnt in air or oxygen;—
the flame of other bodies;
ing when mixed with half its
xygen, and fired.

Pure and uncombined hydrogen
oyed in the arts. Inhalations of
e, however, been occasionally used
Dr. Beddoes recommended them
In combination, the uses of hy-
almost numberless. Combined with
forms water; with chlorine, hydro-
; with fluorine, hydrofluoric acid;
gen, hydrocyanic acid; with carbon,
hydrocarbons; with nitrogen,
with sulphur, sulphuretted hydro-
, an enumeration of the valuable
which it enters into would occupy
of this work. From its extreme
has been used to fill balloons, but
ow commonly *employed for this* purpose. On its property of inflaming in contact with spongy platinum is arranged the popular little instrument for the production of instantaneous light (DOBEREINER'S LAMP) sold by the philosophical instrument makers. The chemist avails himself of the great heat developed by its combustion in oxygen in the formation of the OXYHYDROGEN BLOWPIPE.

Some of the compounds of hydrogen are noticed *below;* the others under their respective names.

Antimo″niuretted Hydrogen. SbH_3. *Syn.* ANTIMONETTED HYDROGEN, HYDRIDE OF ANTIMONY, STIBAMINE; HYDROGENIUM ANTIMONIATUM, L. A gaseous compound of antimony and hydrogen, prepared by dissolving an alloy of antimony with a large excess of zinc in hydrochloric or dilute sulphuric acid. It has never been obtained pure, a variable proportion of free hydrogen being always present. It burns with a bluish-white flame, giving rise to dense fumes of teroxide of antimony, and when conducted through a red-hot tube, or the flame is thrown on a cold surface, as a porcelain plate, metallic antimony is deposited. This gas is a deadly poison when inhaled. See ARSENIOUS ACID.

Arsen′iuretted Hydrogen. AsH_3. *Syn.* ARSENETTED HYDROGEN, HYDRIDE OF ARSENIC, ARSENAMINE; HYDROGENIUM ARSENIURATUM, L. A gaseous compound of arsenic and hydrogen.

Prep. Arsenide of zinc (made by fusing together equal weights of zinc and arsenic) is acted upon by strong hydrochloric acid or by sulphuric acid diluted with three parts of water.

Obs. This gas is produced whenever arsenious or arsenic acid, or any of their salts, is in presence of nascent hydrogen. The properties of arsenetted hydrogen are fully described in the tests for ARSENIOUS ACID. This gas is a deadly poison when inhaled.

Car′buretted Hydrogen. *Syn.* CARBONETTED HYDROGEN. This term is specially applied to two of the numerous compounds of carbon and hydrogen (CARBIDES OF HYDROGEN, HYDROCARBONS):—

1. **Light Carburetted Hydrogen.** CH_4. *Syn.* MARSH GAS, FIRE-DAMP, GAS OF THE ACETATES. This is often abundantly disengaged in coal mines, and its combustion occasions those fearful explosions which are so destructive to human life. The mud at the bottom of stagnant pools, on being stirred, suffers bubbles of gas to escape, which, when collected and examined, are found to be a mixture of light carburetted hydrogen and carbonic acid. The latter is easily removed by passing the gas through a solution of caustic potassa or milk of lime.

Prep. (Dumas.) A mixture of acetate of soda (cryst.) and hydrate of potassa (dry), of each, 2 parts, and quicklime (in powder), 3 parts, is strongly heated in a flask or retort. The *gas, in a state of* absolute purity, is disengaged in great abundance, and may be collected over water.

Prop. Colourless; neutral; nearly inodorous; burns with a yellow flame, producing pure water and carbonic acid; explodes when kindled in contact with air or oxygen.

2. **Heavy Carburetted Hydrogen.** C_2H_4. See OLEFIANT GAS.

Obs. COAL GAS, OIL GAS, and RESIN GAS, consist, for the most part, of mixtures of these two gaseous hydrocarbons in uncertain proportions, obtained respectively from coal, oil, and resin, by the action of heat, and used for the purposes of illumination. See GAS.

Oxides of Hydrogen. There are two well-defined compounds of hydrogen and oxygen:—

1. **Subox'ide of Hydrogen.** H_2O. Water which *see*).

2. **Perox'ide of Hydrogen.** HO. *Syn.* HYDROXYL, BINOXIDE OF HYDROGEN, DEUTOXIDE OF H., OXYGENATED WATER; HYDROGENII BINOXYDUM, L. This singular fluid was discovered by M. Thénard, in 1818.

Prep. (Odling.) A known quantity of pure hydrochloric acid, diluted with 8 or 10 times its volume of distilled water, is placed in a glass beaker surrounded with ice or a freezing mixture. A quantity of binoxide of barium rather less than sufficient to neutralise the acid is then ground to a fine paste with distilled water, and added gradually to the acid, in which it should dissolve without effervescence. Diluted sulphuric acid is next added cautiously, to precipitate the barium, and reproduce hydrochloric acid to act upon a fresh quantity of peroxide. The liquid having been filtered from the insoluble sulphate of baryta, a second proportion of binoxide of barium paste is added gradually, as before. The treatment with sulphuric acid, filtration and addition of binxoide, is repeated 6 or 7 times. Sulphate of silver is then very carefully added, so as exactly to precipitate in the form of chloride of silver the whole of the chlorine. After filtration, pure baryta, first as a paste and then in solution, is cautiously added, to precipitate exactly the sulphuric acid set free from the sulphate of silver. Filtration is again resorted to, and the clear liquid (aqueous solution of peroxide of hydrogen) is placed in a dish over oil of vitriol in vacuo, in order that the water mixed with it may evaporate.

Prop., &c. A colourless, transparent, somewhat syrupy liquid, of sp. gr. 1·452. It has a metallic taste, and corrodes the skin. It is easily resolved into oxygen and water. It mixes freely with water, and becomes more permanent by the dilution. It bleaches organic substances, and acts as a powerful oxidating agent. Under certain circumstances, however, it plays the part of a reducing agent. To the chemist, peroxide of hydrogen and its analogue, binoxide of barium, have been of great service as instruments of research. The only use to which binoxide of hydrogen has been applied in the arts, is to res
ened lights of paintings, which
darkened by sulphuretted hydro

Phosphuret'ted Hydrogen. S
RUS.

Sul'phides of Hydrogen. See

HY'DROMEL. *Syn.* HYDRO
aqueous solution of honey. P
Honey, 2 oz.; boiling water, 2
and strain. A refreshing and d
drink; in fevers, hoarseness, so

HYDROM'ETER. *Syn.* ARE
VIMETER; HYDROMETRUM, L.
for ascertaining the specific gra
and hence their strength, th
either in inverse or direct pr
former. Hydrometers are of
1. Those which are always im
same depth in distilled water, a
be tried, small weights being u
pose, as in FAHRENHEIT's and
hydrometers; and 2nd, those wh
to rise or sink freely in the liq
come to a state of rest, as in SY
&c. In both cases a correction
for any variation in temperatur

Of the two kinds, the first
accurate results, and have the g
of being applicable to liquids e
heavier than water, but the
readier in practice, requiring le
skill to use them. The following
known:—

BAUMÉ'S HYDROMETER o
which is very generally employ
tinent, consists of two distinc
the one for liquids heavier th
other for liquids lighter than t
first floats at the 0, or 'zero,'
distilled water, at the temperatu
and each degree, marked downw
a density corresponding to on
common salt. The hydromet
lighter than water is poised so t
scale is at the bottom of the ste
floating in a solution of 1 oz. of
9 oz. of water, and the depth to
in distilled water shows 10°; the
these fixed points being equally d
graduation continued upwards
the scale.

The temperature at which the
were originally adjusted by Ba
Centigrade (54·5° Fahr.). The
monly adjusted in this countr
Fahr. Hence arise the discrepan
in the published tables of the "
between degrees of Baumé an
gravities."

CARTIER'S HYDROMETER, w
used in France for light liquid
point for the zero of its scale a
its degrees are rather smaller, 30
equal to 32° Cartier.

FAHRENHEIT'S HYDROMETER
hollow ball, with a counterpois

m above, terminating in a
e middle, or half-length of
nguished by a fine line across
rument every division of the
and it is immersed in all
the middle of the stem, by
weights in the little dish
s the part immersed is con-
ne magnitude, and the whole
drometer is known, this last
the weights in the dish, will
weight of fluid displaced by
as all writers on hydrostatics
cordingly, the sp. gravities for
n of the tables will be had by
-

*weight of the hydrometer and
djusted in distilled water*, is to
, so is the *whole weight when
other fluid*, to the *number ex-
ific gravity.*

s ALCOHOLOMETER is used to
strength of spirituous liquors.
dicates on the stem, the per-
lute alcohol in the liquid exa-
original experiments of Gay-
been made on liquids at a tem-
Fahr., all examples examined by
ter, must either be brought to
re previous to being tested, or a
in the strength found.

s HYDROMETER is constructed
nciple as Fahrenheit's. It has,
he small dish for weights above,
tached below, for holding any
se weight in water is required.
tended for taking the sp. gr. of

IYDROMETER resembles, for the
-Lussac's.

DROMETER is that adopted by
uthorities in England for ascer-
rength of spirits, and has been
oticed.

HYDROMETER resembles Gay-
ly).

s HYDROMETER is much used in
establishments of Scotland, and
of England. According to this
al to 1000 or the sp. gr. of dis-
nd each degree is equal to ·005;
ultiplying this number by the
legrees marked on the scale,
, the real specific gravity is ob-

rometers, unless manufactured
re and skill, merely afford ap-
ults, but which are nevertheless
rrect for all ordinary purposes.
uire several ounces of liquid to
d hence cannot be used for very
s. Those of Fahrenheit, Nichol-
, are the most accurate, both in
application. They are all em-
tall glass cylinder, *termed a
r hydrometer glass, in the way*
already noticed; but the thermometer for ascertaining the temperature must be covered with a glass case, or arranged with a folding scale, to allow of its immersion in corrosive liquids.

ALCOHOLOMETERS, ELAIOMETERS, SACCHAROMETERS, URINOMETERS, &c., are simply hydrometers so weighted and graduated as to adapt them for testing spirits, syrups, urine, &c. See ALCOHOLOMETRY, ALCOHOLMETRY, AREOMETER, SPECIFIC GRAVITY, &c.

HYDROM'ETRY. *Syn.* AREOMETRY. The art of determining the specific gravity of liquids, and hence their strength and commercial value. The instruments used are noticed above; their action depends upon the fact that a floating body displaces a bulk, equal to itself in weight, of the fluid in which it floats, and consequently that a body of a given weight sinks deeper in a lighter than in a heavier fluid. In hydrometric determinations the temperature of the samples must be carefully attended to, for fluids expand as their temperature is increased. The hydrometers used in England are generally adjusted to the standard temperature of 60° Fahr., and when 'Hydrometer Tables,' giving the corrections for the variations of the thermometer, are not accessible, the fluids to be examined should be brought to this standard temperature by applying heat directly to the vessel, when the temperature is below the standard, or by surrounding the vessel with cold water, when it is above the standard. The principal applications of hydrometry are described in different parts of this work. See ACETIMETRY, ALCOHOLOMETRY, CHLOROMETRY, SPECIFIC GRAVITY, &c.

HYDROP'ATHY. *Syn.* WATER CURE; HYDROPATHIA, L. A mode of curing diseases by the copious use of pure cold water, both internally and externally, together with dry sweating, and the due regulation of diet .exercise, and clothing. This "treatment of diseases undoubtedly includes powerful therapeutic agents, which, in the hands of the educated and honourable practitioner, might be most beneficially resorted to as remedia agents." (Pereira.)

HYDROPHO'BIA. *Syn.* CANINE MADNESS; RABIES CANINA, L. A disease which is generally considered as the result of a morbid poison being introduced into the system by the bite of a rabid animal. A clear case of idiopathic or spontaneous hydrophobia has never yet been known to occur in the human subject.

The common symptoms of hydrophobia are great excitability and horror at the sight of water or the attempt to drink, fever, vomiting, excessive thirst, spitting of viscid saliva, difficult respiration, irregular pulse, convulsions, syncope, delirium, and death.

The whole materia medica has been, un*fortunately,* unsuccessfully sought without *the discovery* of a single remedy for this disease, or even a palliative of its severer symptoms.

The treatment of the recent bites of venomous animals has been fully explained, and need not be repeated here. To prevent secondary or constitutional effects arising, the use of lemon juice, or arsenical solution, has long been popular. (Graham, and others.) Dr. Buchan remarks that "vinegar is of considerable use, and should be taken freely."

HYDROSULPHU'RIC ACID. See SULPHUR.

HYGIENE. *Syn.* HYGIÈNE, Fr. Health; its preservation, promotion, and restoration. That department of medicine and civil government which relates to health. See AIR, BATH, EXERCISE, FLANNEL, FOOD, NUTRITION, SLEEP, VENTILATION, &c.

HYOCHOL'IC ACID. $C_{25}H_{40}O_4$. *Syn.* GLYCOHYOCHOLALIC ACID. A compound peculiar to the gall of pigs, discovered by Strecker and Gundelach.

Prep. The fresh gall of pigs is mixed with a solution of sulphate of sodium; the precipitate is dissolved in absolute alcohol, and decolourised by animal charcoal. From this solution ether throws down hyocholate of sodium, which, on the addition of sulphuric acid, yields hyocholic acid as a resinous mass, which is dissolved in alcohol, re-precipitated by water, and dried. When heated with alkaline solutions, glycocine and a new crystalline acid (hyocholalic acid) are formed. When boiled with acids, it yields glycocine and hyodyslysin.

HYOSCY'AMINE. *Syn.* HYOSCYAMIA, HYOSCYAMINA, DATURINE, DATURIA. An alkaloid obtained from common henbane (*Hyoscyamus niger*), and also from the thorn apple (*Datura stramonium*). See DATURINE.

HYPNOT'ICS. *Syn.* HYPNOTICA, L. Agents or medicines which induce sleep, as opium, morphia, henbane, Indian hemp, lactucarium, &c. Agents which prevent sleep are called agrypnotics (*Agrypnotica*, L.), or anthypnotics (*Anthypnotica*, L.).

HYPOCHLO''RIC ACID. See CHLORINE.

HYPOCHONDRI'ASIS. *Syn.* HYPOCHONDRIACISM. The 'hip' or 'hyp,' the 'vapours,' depression of spirits, 'blue devils.' This disease chiefly affects persons of the melancholic temperament, and is commonly induced by hard study, irregular habits of life, want of proper social intercourse, living in close apartments, and insufficient out-of-door exercise. The treatment may, in most cases, be similar to that recommended for DYSPEPSIA, observing, however, that success depends more on amusing and engaging the mind, and in gradually weaning it from old conceits, than in the mere administration of medicine. When the patient is tormented with a visionary or exaggerated sense of pain, or of some concealed disease, or a whimsical dislike of certain persons, places, or things, or groundless apprehensions of personal danger or poverty, or the conviction of having experienced some dreadf
misfortune, the better way is
direct attempts to alter his o
endeavour to inspire confiden
thod of relief. Greding mentic
a medical man who conceived th
was full of frogs, which had b
spawning ever since he had l
boy, in a pool in which he had
tadpoles; and he had spent hi
vouring to get them removed
perhaps, fancies himself a gia
heavy as lead; a third, a feath
danger of being blown away by
a fourth, a piece of glass, and i
of being broken. Marcellus
tions a baker of Ferrara who th
lump of butter, and durst not
or come near the fire, for fear c
The writer of this article once k
always put on his coat the wro
because he conceived his face loo
In such cases it is useless to
patient, as it only causes irritatio
the malady. The restoration
health, and a sudden surprise
scene, will often effect a cure.

HYPONI'TRIC ACID. See N

HYPONI'TROUS ACID. See

HYPOPHOS'PHITES. See I

HYPOPHOSPHITE. A salt o
rous acid.

HYPOSUL'PHATE. *Syn.*
HYPOSULPHAS, L. A salt of
acid.

HYPOSUL'PHITE. *Syn.* T
HYPOSULPHIS, L. A salt of l
acid.

HYPOSUL'PHUROUS ACID
PHUR.

HYRA'CEUM. A substance
Cape badger (*Hyrax Capensis*
as a substitute for CASTOREUM.
dered it to be inert and useless.

HYSTERICS. *Syn.* HYSTERI
TERICA, L. In *pathology*, a ne
peculiar to women, attacking i
fits, preceded by dejection,
breathing, sickness, and palp
heart. The treatment of this
with the causes and the symptc
cupping, and depletives, are ge
course to in robust and pleth
stimulants and tonics in those
relaxed constitution. Affusion
and nasal stimulants will freq
the fit in mild cases. Exercise,
ments, and regular hours and d
preventives. See DRAUGHT (A
Hydrocyanic), &c.

ICE. *Syn.* GLACIES, L. W
state. On being cooled, water
tracts until the temperature has
Fahr., when it begins to ex
freezing-point, 32° Fahr., and

crystallises or freezes, and in
the continued expansion, the
s compared with that of water
94 to 1·00. Ice has the peculiar
uniting by the contact of adjoin-
fter having been broken into
ELATION). Coloured water and
freezing, produce colourless and
clean solid ice, when thawed,
r equal in purity to that which
led.

ice in the preparation of ICE-
-LIQUORS, &c., is noticed else-
confectioner collects his ice as
le during the winter, and stores
rained well or excavation, some-
form of an inverted sugar-loaf,
small shed or building called an
This building should always be
dry sandy soil, and, if possible, on
. The door should be on the
d the roof should be conical and
hed with straw.

e, ice is frequently employed ex-
inflammation of the brain, to
mmation, to stop hæmorrhage, to
laxed parts, and as an anodyne, to
For these purposes it is pounded
cloth, and placed in a bladder or
e (ICE-CAP, ICE-POULTICE) before
Internally, ice or ice-cold water
ven with advantage in heartburn,
flammation and spasms of the
check the vomiting in cholera,
t hæmorrhage, whether bronchial,
al, or uterine. Very recently, ice
roposed as a remedy in the treat-
iphtheria. Small lumps of ice,
glassful of pounded ice-and-water,
temporarily restore the tone of
and nervous system during hot
hen all other means fail. Ice-
en in moderation, act in the same

rmer climates of Europe an ICE-
n ICE-SAFE (a REFRIGERATOR) is
appendage to every respectable
t merely for the purpose of pleas-
ate with iced beverages, but to
residents to preserve their provi-
neat, game, milk, butter, &c.) in a
state from day to day. See REFRI-

) MOSS. *Syn.* CETRARIA (B. P.),
LANDICUS, L. The lichen termed
andicus. It is much employed, both
us food and as a mild mucilaginous
arrh and consumption. It may be
its bitter principle by a little cold
otassa.

n *confectionery*.) These are com-
osed of cream or sweetened water,
avoured, and congealed by ice or a
ture. Sometimes, instead of cream,
s of a custard are used. The mixed
are placed in a tin furnished with a handle at top, called a 'freezer,' or 'freezing-pot,' which is then plunged into a bucket containing ice broken small, and mixed with about half its weight of common salt, and is kept in rapid motion, backwards and forwards, until its contents are frozen. As the cream congeals and adheres to the sides, it is broken down with the ice-spoon, so that the whole may be equally exposed to the cold. As the salt and ice in the tub melt, more is added, until the process is finished. The 'ice-pot,' with the cream in it, is next placed in a leaden 'ice-stand,' is at once surrounded with a mixture of ice and salt, and closely covered over. In this state it is carried into the shop. The glasses are filled as required for immediate use, and should have been previously made as cold as possible.

PLAIN ICE-CREAM, or CREAM FOR ICING, is commonly made by one or other of the following formulæ:—

1. New milk, 2 pints; yolks of 6 eggs; white sugar, 4 oz.; mix, strain, heat gently, and cool gradually.

2. Cream, 1 pint; sugar, 4 oz.; mix, as above.

3. Cream and milk, of each, 1 pint; white sugar, ½ lb.

FLAVOURED ICE-CREAMS are made by mixing cream for icing with half its weight of mashed or preserved fruit, previously rubbed through a clean hair sieve; or, when the flavour depends on the juice of fruit or on essential oil, by adding a sufficient quantity of such substances. RASPBERRY and STRAWBERRY ICES are made according to the former method; LEMON, ORANGE, NOYEAU, and ALMOND ICES, by the latter method. In the same way any other article besides cream may be frozen.

CHOCOLATE FOR ICING is made by rubbing 1 oz. of chocolate to a paste with a tablespoonful of hot milk, and then adding 'cream for icing,' 1 pint.

COFFEE FOR ICING is made of cream for icing, 1 quart, to which a small teacupful of the strongest possible clarified coffee has been added, together with 2 oz. of sugar and the yolks of 3 or 4 eggs. See ICING (*below*).

I'CING. (For cakes.) *Syn.* SUGAR ICE. The covering of concreted sugar with which the confectioners adorn their cakes. *Prep.* Beat the white of eggs to a full froth, with a little rose or orange-flower water; then add, gradually, as much finely powdered sugar as will make it thick enough, beating it well all the time. For use, dust the cakes over with flour, then gently rub it off, lay on the icing with a flat knife, stick on the ornaments while it is wet, and place it in the oven for a few minutes to harden, but not long enough to discolour it. It may be tinged of various shades by the addition of the proper 'stains.'

ID'RIALIN. A fusible, inflammable substance, found associated with the native cinnabar of the mines of Idria, in Carniola. It is extracted from the ore by means of oil of turpentine. It is only slightly soluble in alcohol and ether. When pure, it is white and crystalline.

ID'RYL. A hydrocarbon generally found associated with idrialin.

IGASU'RIC ACID. *Syn.* ACIDUM IGASURICUM, L. An acid associated with strychnine in the St. Ignatius' bean and in nux vomica. It may be obtained by digesting the rasped or ground beans first in ether and then in boiling alcohol, evaporating the latter decoction to dryness, diffusing the residuum through water, adding a little carbonate of magnesium, again boiling for some minutes, filtering, washing the powder with cold water, and digesting it in alcohol, and filtering. The igasurate of magnesium thus obtained is dissolved in boiling water, the solution decomposed by acetate of lead, and the precipitate (igasurate of lead), after being washed and diffused through distilled water, is decomposed by sulphuretted hydrogen. The solution thus obtained yields crystals (igasuric acid) on being evaporated. It is soluble in both water and alcohol.

IGNI''TION. In the laboratory, this term is commonly applied to the act of heating to redness or luminousness. See CALCINATION.

ILLUMINA'TION. The act of illuminating or making luminous. For supplying artificial light to streets and the interiors of houses coal gas and oils and fats are generally employed. These illuminating agents are compounds rich in carbon, upon the presence of which the brightness of their flames depends. Flame is gas or vapour heated to incandescence during the process of combustion. A flame containing no solid particles emits but a feeble light, even if its temperature is the highest possible. Pure hydrogen, for instance, burns with a pale, smokeless flame, though with the production of considerable heat. On the other hand, wax, paraffin, coal gas, &c., while undergoing combustion, give out considerable light, because their flames contain innumerable solid particles of carbon, which act as radiant points. To give the greatest degree of luminosity to flame, the supply of air must be proportioned to the character of the burning substance, and be insufficient for the instantaneous combustion of the evolved gases; in which case the hydrogen takes all the oxygen, and the larger portion of the carbon is precipitated, and burnt in the solid form, at some little distance within the outer surface of the flame. When the supply of air is sufficient for the immediate and complete combustion of the whole of the combustible matter, no such precipitation takes place, and the flame is neither white nor brilliant. The richest coal gas, mixed with sufficient air to convert all its hydrogen and carbon into water and carbonic acid, explodes with a pale blue flash; yet the same gas, when consumed in the ordinary way, burns with a rich white flame. Every one must have noticed the effect of a gust of wind upon the flaring gas-jets of a butcher's shop; the plentiful supply of air causes complete combustion, and the bright white flames into dull of fire. When the supply of air is to cause the combustion of the solid carbon at the instant of its and whilst it is in an incandescent flame becomes red and smoky, sooty particles are thrown off. occurs when the temperature of of the hydrogen is reduced tensity required for the combust newly separated charcoal. Solid tallow, oils, and fats, which burn are converted into the state of gas required to kindle them, and it is matter which suffers combustion, substance which produces it.

The relative value of the ordi nating agents has been accurately by Dr. Frankland. According to ments, the quantities of various quired to give the same amount would be obtained from 1 gallon Paraffin oil are as follows:—

Young's Paraffin oil .	1
American rock oil[1] .	1
Paraffin candles . .	18
Sperm	22
Wax	26
Stearic	27
Composite . . .	29
Tallow	39

The following table exhibits the cost of the light of 20 sperm burning 10 hours at the rate of hour; also the amount of carbon duced and heat evolved per hour, this quantity of light:—

	Cost. *s.*	Cost. *d.*	Carb. per hou cub. f
Wax . . .	7	2½	... 8
Spermaceti .	6	8	
Paraffin candles	3	10	... 6
Tallow . .	2	8	... 10
Rock oil . .	0	7½	... 3
Paraffin oil .	0	6	
Coal gas . .	0	4½	... 5
Cannel gas .	0	3	... 4

These figures prove that coal mineral oils are the cheapest luminating agents, producing amount of light with the least de heat.

The light emitted by incan (DRUMMOND LIGHT, HYDRO-OXY LIME LIGHT, OXYHYDROGEN LI tensely brilliant, and is often m enable workmen to continue o night. It is obtained by directi produced by the combustion of hydrogen (or coal gas) and oxygen cylinder of lime. In the impro

---

[1] Acknowledged to be an inferi

ime is protected from crum-
of platinum wire, and is caused
by means of clockwork, so as
xpose a fresh surface to the
eflected from a 'parabolic mir-
of parallel rays, the Drummond
ecognised during daylight at a
miles. The lime light produced
d oxygen is used for the MAGIC
AS MICROSCOPE.

erful illuminator is the ELEC-
It is produced by the passage of
t of voltaic electricity between
hard charcoal or coke, such as
in the retorts of gas-works.
ght has been successfully applied
illumination. It is too intense,
too great, for its application to
oses. See CANDLES, FLAME, GAS,
&c.

ON. See BATH (Mud).

TION. The influence of the ima-
in the production and cure of
been long admitted by medical
It is probably the most power-
tic agent known. "Extraor-
have been ascribed to inert and
, when, in fact, they were re-
influence of the imagination."
)

L. *Syn.* POTUS IMPERIALIS,
L. *Prep.* 1. Cream of tartar,
mon, sliced; lump sugar, 2 oz.;
, 1 quart; infuse, with occasional
cold, then pour off the clear por-

n, sliced; sugar, 1 oz.; boiling
.

rind and juice of lemon; citric
sugar, 2½ oz.; hot water (which
led), 1 quart; as No. 1. Refri-
lightly diuretic. *Used* as a com-
in fevers, dropsy, &c., and as a
rage.

ENTS (Agricultural). "Almost
tions of agriculture may be per-
e plough, the harrow, the scythe,
; and these are the sole imple-
primitive agriculture of all coun-
the progress of improvement,
implements (and machines) have
uced, the more remarkable of
he DRILL PLOUGH, the HORSE
NNOWING MACHINE, the THRESH-
E, the HAY-MAKING MACHINE,
ING MACHINE. The object of all
ents and machines is to abridge
r, and to perform the different
which they are applied with a
e of rapidity, and in a more per-
, than before." (Loudon.) On
of agricultural implements and
pends much of the improvement
is art is susceptible. See AGRI-
.

ING. *The trade name for* 'doctoring,' 'adulterating,' or 'lowering,' the quality of any substance, with the view of cheapening it or increasing its bulk. See WINE, &c.

IN'CENSE. *Prep.* 1. Olibanum, 2 or 3 parts; gum benzoin, 1 part.

2. Olibanum, 7 parts; gum benzoin, 2 parts; cascarilla, 1 part. Placed on a hot plate or burned, it exhales an agreeable perfume. Used in some of the rituals of the Roman Catholic Church.

INCINERA'TION. The reduction of organic substances to ashes by combustion. See CALCINATION.

INCOMBUSTIBIL'ITY. The property of being incapable of being kindled, or of being consumed by fire. Substances possessing this property are said to be 'incombustible' or 'fireproof.'

INCOMBUST'IBLE FAB'RICS. *Syn.* NON-INFLAMMABLE FABRICS. The fashion of wearing light gauzy dresses extended by hoops or crinoline has made death from fire a common casualty. With a view of diminishing the danger to which women expose themselves, chemists have lately devoted considerable attention to the problem of rendering muslin and other light fabrics non-inflammable. This object may be attained by steeping the fabric in almost any saline solution. Thus, cotton or linen stuffs prepared with a solution of borax, phosphate of soda, phosphate of ammonia, alum, or sal-ammoniac, may be placed in contact with ignited bodies without their suffering active combustion or bursting into flame. The salts act by forming a crust of incombustible matter on the surface of the fibres. They do not, however, prevent carbonisation taking place, when the temperature is sufficiently high. It is by a knowledge of this property of culinary salt, that jugglers are enabled to perform the common trick of burning a thread of cotton whilst supporting a ring or a small key, without the latter falling to the ground. The cotton is reduced to a cinder, but, from the action of the salt, its fibres still retain sufficient tenacity to support a light weight.

The addition of about 1 oz. of alum or sal-ammoniac to the last water used to rinse a lady's dress, or a set of bed furniture, or a less quantity added to the starch used to stiffen them, renders them uninflammable, or at least so little combustible that they will not readily take fire; and if kindled, are slowly consumed, without flame. None of the above-named salts are adapted for fine soft muslins, which mostly require chemical treatment, because they injure the texture, rendering the fabric harsh and destroying all its beauty. The salt which is found to answer most completely all the required conditions is TUNGSTATE OF SODA. "Muslin steeped in a solution containing 20% of this salt is perfectly non-inflammable when *dry, and* the saline film left on the surface is *smooth* and of a fatty appearance like talc, and the 'tungstate' is apt to undergo a chemical change and become comparatively insoluble. Messrs. Versmann and Oppenheim, the introducers of tungstate of soda, give the following formula for a solution of minimum strength:—

Dilute a concentrated solution of neutral tungstate of soda with water to 28° Twaddell (sp. gr. 1·14), and then add 3% of phosphate of soda. This solution is found to keep and to answer its purpose very well; it is now constantly used in the Royal Laundry.

Paper, wood, &c., may also be rendered comparatively incombustible by soaking them in saline solutions. See Asbestos, Fire, &c.

INCOMPATIBLES. In *medicine* and *pharmacy*, substances which exert a chemical action on each other, and cannot, therefore, with propriety, be prescribed together in the same formula or prescription. The principles on which we should act to avoid prescribing or dispensing incompatibles, are briefly developed under the heads Affinity and Decomposition. To this we may add that, if a substance is endowed with well-marked therapeutical or poisonous properties, independent of those which may exert a chemical effect upon the tissues, its mode of action will neither be changed nor destroyed by the combinations which it forms, provided always that the new compounds are not insoluble in water.

"It is not necessary to give two incompatible medicines at the same time, in order to produce decomposition; it is sufficient if they

quence of the accumulation o
from large quantities of wate
sparing solubility of the s
(gypsum) in hot water fully
deposition in the boiler, and
lime (chalk) is thrown down,
result of direct evaporation, b
tion expelling free carbonic
this body to some extent in
water, which of itself is too p
these incrustations, cannot b
boiler purposes, for it has bee
a highly corrosive action upo
and fittings. It can, how
tageously employed in conjun
spring or river waters, and
diminishing the incrustation
result of dilution. The dr
from the roof of the factory
connection with the tank or
the supply of water is draw
It will be seen, hereafter, t
remedy is efficient both as a
ing incrustation and obviati
that by using one of the al
about to be specified this t
may be secured. Iron will
immersed in water containin
caustic alkali, and it is a co
that the iron vessels used in
potash and soda remain for a
free from all appearance of r
property is, no doubt, suscep
applications, amongst them
the better protection of iro

d, at the same time, avoid the
nd of ebullition known as
all cases it is advisable to
d system of inspection, and it is
of saving fuel and labour that
of boiler-fluids is to be recom-

has often resulted from a coat-
or 'dead oil' applied to the
s below the water line, when
ened for cleaning and inspection.
l very considerably to lessen the
lcareous crusts, and are not in
ted by the boiler fluids in com-
la crystals and caustic soda may
reat success in boilers to effect
precipitation of the lime salts,
y throwing down a finely divided
nate of lime, which in time fur-
for the deposition of subsequent
h of the carbonate and sulphate,
are prevented from crystallising
s of the boiler. A granular mud
l, which subsides quickly and may
ost part got rid of through the
k,' which should be opened for
two or three times every day, and
as little water as possible.

f caustic soda has undergone a
l at the hands of Mr. J. Spiller,
e boilers of the Royal Arsenal,
d we are favoured with the fol-
al instructions regarding its use,
ed upon an experience of upwards
The caustic soda should be dis-
ter so as to make a concentrated
pecific gravity 1300. This, being
scible with water, may be intro-
the boiler with the feed-water at
en, from the pressure of steam, it
convenient to pour it through the
or other openings in the boiler.
he steam is down there is no diffi-
troducing the prescribed dose by
funnel with flattened aperture to
ugh the safety valve; or a tubular
t with double cocks will answer at
Half a gallon per diem is the
antity found sufficient for a 20-
sary boiler, working with Thames
n hours daily. If the water should
be unusually hard a larger dose may
d, but it would not be expedient to
charge more than the amount required
y's consumption. Locomotive and
ar boilers have been worked success-
caustic soda, and it is here that the
of using anti-incrustation fluids
f most apparent.

ther methods have at various times
sed to prevent the formation of
steam boilers. Dr. Ritterband's
sists in simply throwing a little sal-
nto the boiler, by which carbonate
a is *formed, which passes off with*
and chloride of calcium, which remains in solution. In Holland this plan has been used with satisfaction for locomotive boilers. About 2 oz. of the salt may be placed in the boiler twice a week. The chloride of tin is equal to sal-ammoniac, and is similar in its action. Carbonate of soda has been recommended by Kuhlmann and Fresenius of Germany, and by Crace Calvert of England. It is now employed generally in the boilers of engines in Manchester. The common plan adopted by working engineers to prevent incrustations from either variety of water is, on each occasion of cleaning out the boiler, to introduce some substance which, by its mechanical action, shall prevent the precipitated earthy matter caking together, or adhering to the boiler plates. Some common tar, bitumen, or pitch, appears to answer well under most circumstances. Mr. Ira Hill recommends the use of 3 or 4 shovelfuls of coarse sawdust. He states that, after adopting the use of this article, he never had any difficulty from lime, although using water strongly impregnated with it, and has always found the inside of his boilers as smooth as if just oiled. We have worked a powerful boiler daily for months without opening the 'man-hole,' after throwing a few pounds of potatoes into it. In all cases, when the earthy matter can be kept in a state of solution, or precipitated in a pulverulent form, it is easily removed from the boiler by what engineers term 'priming,' which is allowing the hot water to be blown over with the steam, so that, after a sufficient time, the whole original contents of the boiler are removed, and replaced by fresh water. Before doing so, however, it is of consequence to cut off the communication with the cylinders, and to open the waste-steam cock.

INCUBA'TION (Artificial). The hatching of eggs by artificial heat. This has been practised by the Egyptians from a very remote period. M. Bonnemain has the honour of having introduced this art to Western Europe, in 1775, and having been the first to pursue it successfully on the commercial scale. The source of heat employed by him was a circulatory hot-water apparatus, and the temperature maintained by it 100° Fahr. His plan was to introduce, daily, 1-20th only of the eggs the apparatus was capable of receiving, so that on the 21st day the first chickens were hatched, and a like number every day afterwards as long as the supply of eggs was kept up. Among the trays containing the eggs he placed saucers of water, to compensate for the absence of moisture derived in natural incubation by transpiration from the body of the hen. The chickens, as soon as hatched, were transferred to a 'nursery' or 'chick-room,' also artificially heated, and were fed with crushed millet seed. Several attempts have been made of late years to introduce artificial incubation into this country, with variable success.

IN'CUBUS. See NIGHTMARE.

IN'DIA RUB'BER. See Caoutchouc.

INDIGES'TION. See Dyspepsia.

IN'DIGO. *Syn.* Indicum, Pigmentum Indicum, L. A blue dyestuff extracted from several plants growing in India and America, especially from the leguminous species *Indigofera tinctoria* and *I. cærulea.* It exists in the plant as a colourless juice. The method of manufacture consists in steeping the plant in water until fermentation sets in; the colouring matter dissolves in the water, forming a yellow solution, which is drawn off from the rest of the vegetable matter, and agitated and beaten to bring it freely into contact with the air for about 2 hours; this treatment causes the indigo to form and settle down as a blue precipitate; this is cut, while soft, into cubical cakes, and dried by artificial heat. To hasten the formation of the indigo, a little lime water is sometimes added to the yellow solution. The indigo of commerce contains indigo-blue or indigotin, its most important constituent, indigo-red, and many other substances, some of which must be regarded as accidental impurities or adulterations.

Prop. Tasteless; scentless; of an intense blue colour, passing into purple; when rubbed with a smooth hard body, it assumes a coppery hue; insoluble in water, cold alcohol, ether, alkalies, hydrochloric acid, dilute sulphuric acid, and the cold fixed and volatile oils; slightly soluble in boiling alcohol and oils; freely soluble in concentrated sulphuric acid, and, when decoloured or reduced by contact with deoxidising substances, in alkaline lyes; soluble in creasote; its colour is destroyed by chromic acid, nitric acid, and chlorine; when suddenly heated, it gives off rich purple fumes, which condense into brilliant copper-coloured needles.

Pur. The best indigo is that which has the deepest purple colour, and assumes the brightest coppery hue when rubbed with the nail; its fracture is homogeneous, compact, fine-grained, and coppery; its powder is of an intensely deep blue tint, and light enough to swim on water; and it leaves only a fine streak when rubbed upon a piece of white paper. In general, when indigo is in hard, dry lumps of a dark colour, it is considered of bad or inferior quality. Indigo, when in hard or brittle lumps, or in dust or small bits, is often adulterated with sand, pulverised slate, and other earthy substances.

Estimation. Various methods for estimating the value of samples of indigo have been proposed, but none of them can be depended upon to give perfectly accurate results. The plan recommended by O'Neill[1] is perhaps the best; it is performed as follows:—

Weigh 25 grs. of a fair sample of the indigo finely ground; and to soften and disintegrate it still further, boil it for a short time with weak caustic soda, and then, if there be any
soft lumps or clots, strain th
this with 8 quarts of water in
bottle which it will nearly fill,
of quicklime, which has bee
fectly as possible; shake
1000 grs. measure of solutio
peras' (protosulphate of iron)
cork the bottle closely, and
days, frequently shaking it
The indigo will be dissolved
quart of the clear solution is
up in a bottle to oxidise
acetic acid, and the pure in
collected upon a filter, dri
Four times the weight of t
the per-centage of indigo in t

Uses. As a dye stuff, indig
portance, both from the beaut
of the colour it yields, and fr
which it is applied to fabric
As a medicine, it has been em
affections of a spasmodic ch
convulsions, epilepsy, hyster
quantities, it often induces gi
and diarrhœa; and when co
time, muscular twitchings,
arising from strychnine.—*D*
about 15 grs., and gradually
or even 3 drs., at which it sh
for 3 or 4 months; made i
with honey or sugar, to whic
may be added. See Indigo
&c.

Indigo, Sul'phate of. *Syn*
acid, Sulphindigotic a.,
Soluble indigo.

Prep. By gradually addin
powder), 1 part, to fuming
(Nordhausen sulphuric acid),
vitriol, 8 parts, contained
vessel placed in a tub of ver
prevent the mixture heating;
are stirred together with a g
intervals until the solution i
which the whole is allowed to
48 hours, by which time it
geneous pasty mass of an int
which in a dull light appears

Obs. In this state it forms
or the 'chemic blue' or
sition' of the dyer. Dilu
twice its weight of soft wate
into the 'Saxony blue' or '
the shops, also used for dyei
mercial sulphate of indigo is
a large quantity of water, ne
wool (old white flannel rags,
in it for some time, the la
whole of the sulphate and
whilst the liquor assumes
colour. Wool, so prepared,
in cold water, and boiled for
a large quantity of that liquid
2% of carbonate of potassa, or
to about 1-3rd that of the i
employed, gives up its blue

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[1] See 'Dictionary of Calico Printing and Dyeing.'

own. The liquid is now a
. solution of sulphindylate
which the salt may be ob-
s evaporation. This com-
l on the large scale, by di-
indigo with about 12 times
water, and imperfectly satu-
a with carbonate of potassa;
falls down as a dark-blue
owder, soluble in 140 parts
in about 90 parts of boiling
stance is kept both in the
tate, and is known in com-
respective names of 'DIS-
' 'PRECIPITATED INDIGO,'
D,' 'INDIGO PASTE,' 'BLUE
LLED BLUE,' 'SOLUBLE BLUE,'
sively used in dyeing; and
a starch, whilst in the moist
into cakes or knobs, it con-
t variety of the 'BLUE' used by
inging linen. The ammonia
nay be prepared in the same
tassa salt, by substituting
of those bases for carbonate
s ammonia salt is very solu-

E. See INDIGOTIN.

. There are two methods of
ons of indigo for dyeing.—1.
it, and then dissolving it in
ia.—2. By dissolving it in sul-
The former method is used in
ordinary INDIGO VAT of the

VAT.) Take of indigo, in fine
green copperas (clean cryst.),
ewly slaked lime, 3½ to 4 lbs.;
powdered indigo with a little
aline lye, then mix it with some
the lime, and again well mix,
ir in the solution of copperas,
whole thoroughly at intervals
A little caustic potassa or soda
dded, and a corresponding por-
mitted. For use, a portion of
ion vat' is ladled into the
as wanted. After being em-
me time, the vat must be re-
little more copperas and fresh-
hen the sediment must be well
d the whole thoroughly mixed
his is the common vat for

VAT.) Take indigo, in fine
.; madder, 8 lbs.; bran, 9 lbs.;
bs.; water at 125° Fahr., 120
ix well; at the end of about 36
bs. more potash, and after 10 or
r further add 10 lbs. of potash,
whole up well; as soon as the
nd reduction of the indigo are
, which generally takes place in
, add a little fresh-slaked lime.
very quickly, *and the goods lose*
our in alkaline and soapy solutions than when dyed in the common vat. It is well adapted for woollen goods.

c. (WOAD VAT.) As the last, but employing woad instead of madder; the vat is 'set' at 160° Fahr., and kept at that temperature until the deoxidation and solution of the indigo has commenced. The last two are also called the 'warm vat.'

d. (PASTEL VAT.) This is 'set' with a variety of woad which grows in France, and which is richer in colouring matter than the plant commonly known as 'woad.'

Obs. Wool, silk, linen, and cotton, may each be dyed blue in the indigo vat. The goods, after being passed through a weak alkaline solution, are subjected to the action of the vat for about fifteen minutes; they are then freely exposed to the air; the immersion in the vat and the exposure are repeated until the colour becomes sufficiently deep. Woad and madder improve the richness of the dye. Other deoxidising substances, besides those above mentioned, may be used to effect the solution of the indigo; thus a mixture of caustic soda, grape sugar, indigo, and water, is often employed on the Continent for this purpose; and orpiment lime, and pearlash are also occasionally used. When properly prepared, the indigo vat may be kept in action for several months by the addition of one or other of its constituents, as required. An excess of either copperas or lime should be avoided.

2. Solution of sulphate of indigo is added to water, as required, and the goods, previously boiled with alum, are then immersed in it, and the boiling and immersion are repeated until the wool becomes sufficiently dyed.

Obs. With this every shade of blue may be dyed, but it is most commonly employed to give a ground to logwood blues. The colouring matter has affinity for woollen and silk with or without 'mordant,' but none for cotton. A solution of soluble indigo (sulphindylate of potassa or soda), in water very slightly acid with sulphuric acid, imparts a very fine blue to cloth, superior in tint to that given by the simple sulphate. See DYEING, &c.

INDIGO PUR'PLE. *Syn.* PHŒNICINE. The name given by Mr. Crum to the purple precipitate obtained by filtration from a solution of indigo in fuming sulphuric acid, when largely diluted with water.

INDIGO RED. *Syn.* INDIGO RESIN, RED RESIN OF INDIGO. This is prepared by boiling alcohol (sp. gr. ·830), on powdered indigo previously exhausted by digestion in dilute acids and in a strong alkaline solution. When heated, it is converted into a white sublimate (deoxidised indigo red), but recovers its red colour by the action of nitric acid.

INDIGO WHITE. *Syn.* INDIGOGENE, INDICYLE, REDUCED INDIGO, HYDROGENISED I., HYDRATE OF I. Reduced or deoxidised indigo *blue.*

Prep. The yellow alkaline solution obtained air; soluble in alkalies, alcohol, and ether, to which it imparts a yellow colour. These solutions deposit indigo blue on exposure to the air. A solution of this substance constitutes the indigo vat of the dyer (see *above*).

INDIGO'TIN. *Syn.* CERULIN, INDIGO BLUE. This is the pure blue principle of indigo. It appears to be the oxide of the same organic radical of which indigo white is probably the hydrate.

Prep. 1. Indigo (in fine powder) is digested successively in dilute hydrochloric acid, solution of potassa, and alcohol; the dried residuum is crude indigotin.

2. Indigo (in fine powder), 1 part; green sulphate of iron, 2 parts; hydrate of lime, 3 parts; water, 15 parts; mix, agitate occasionally until the colour is destroyed, then decant the clear portion, precipitate with dilute hydrochloric acid, and wash the powder, first with water, and then with boiling alcohol, until the latter ceases to acquire a yellow colour.

3. Caustic soda and grape sugar, of each, 1 part; water, 20 parts; powdered indigo, 5 parts; mix, and proceed as last. The above are essentially the same as the indigo vat, but on the small scale.

4. The process for estimating the value of indigo given under INDIGO is a good process for obtaining indigotin.

Obs. The product from all the above exceeds 50% of the indigo operated on.

5. (Taylor.) Powdered indigo, 2 parts; plaster of Paris, 1 part; water, q. s. to reduce the mixture to a thin paste; spread the mass

with her milk to her offspring
pay close attention to her
sources of irritation and anxi
her that an angry mother sou
produces a fractious and o
infant. I am quite of opinion,
were sound in constitution, a
requisite care upon the main
health, we should hear littl
children. In children, as w
the rules of health must be c
their neglect cannot fail to
heavy retribution. (Eras. W
ERCISE, NURSING, &c.

INFANT'S PRESERVATI
Carbonate of magnesia, 6 dr
2½ oz.; oil of aniseed, 20 d
spirit of ammonia and rectifie
2½ fl. drs.; laudanum, 1 fl.
saffron, 1 oz.; caraway wate
the whole measure 1 pint. A
and hypnotic.

INFEC'TION. *Syn.* CONTA
munication of disease, either
tact with the sick or by m
arising from their bodies.
been made to restrict the te
the former, and infection to
this distinction is now disca
jority of writers. The followi
cipal diseases which are comm
contagious:—chicken-pox, ch
dysentery, erysipelas, gland
hooping-cough, hydrophobia,
mumps, ophthalmia (purulent
head, scarlet fever, smallpox

n of the blood, which always
l inflammation, and progress
ity, are usually combated by
g from the arm, repeated a
n a third time, until some ob-
is gained. In inflammations
ly local character, cupping or
rt immediately affected, or the
to it, is in general more appro-
ssful. In these cases the ap-
efrigerant or sedative lotions,
erally proves of much advan-
in which there is induration
he part, the use of warm embro-
ated.

n often arises from apparently
uses, particularly in persons of
abit of body, or who indulge in
malt liquors. In some persons
local injury, as a slight abrasion,
sprain, produces a considerable
mefaction, attended with severe
excitement. Punctured wounds,
dislocations, commonly furnish
ous cases of inflammation that
re external injury. See Abscess,
UR, &c.

n of the Bowels. The common
autious exposure to cold, the use
food, and the presence of acrid
hardened fæces in the bowels.
stant symptoms are pain over the
irst, heat, and excessive restless-
iety; sickness, obstinate constipa-
ard, small, quick pulse. In the
he pain and tenderness of the ab-
cially around the navel, become
d there is difficult micturition.
es the pain suddenly ceases, the
es tumid, the pulse scarcely per-
countenance ghastly, and the
in a few hours. The treatment
very copious bleeding, leeches to
n, hot bath and fomentations,
ters, and murcurial purges; with
draughts and opium to allay sick-
ed by diaphoretic salines and gentle
See Stomach, &c.

MATORY FE'VER. See Fever
MATION.

ZA. See Catarrh.

N. *Syn.* Infusum, Infusio, L.
edicine, prepared by macerating
animal substances in water, at any
below that of ebullition.

e of preparing infusions is, with
nces, precisely similar to that
making the almost universal
A. The ingredients are com-
d in a stoneware pot or vessel (an
t'), previously made hot; boiling
poured over them, and the cover
on, the whole is allowed to digest
first, for a short time, in a warm
on the hob or the fender, and
the vessel *being removed from the* heat) until the whole becomes cold. The liquid is then poured from the ingredients, and the latter, being slighty pressed, if necessary, the infusion is strained through a piece of clean linen or a hair sieve for use. During the digestion the ingredients should be occasionally stirred, an important matter often neglected, and not even referred to by most pharmaceutical writers.

The substances employed for making infusions receive the same preliminary treatment as those intended for making Decoctions. Shavings, leaves, and flowers, require no previous preparation beyond being pulled asunder; but roots, woods, and other solid substances, must be bruised or sliced, if in the green or recent state, or bruised or coarsely pulverised, if dry, for the purpose of exposing as large a surface as possible to the action of the menstruum.

The substances extracted by water from vegetables by infusion are chiefly gum, mucus, extractive, tannin, certain vegetable acids, the bitter and narcotic principles, gum-resin, essential oil, and alkaloids. Some of these substances are only sparingly soluble in water at ordinary temperatures; but more readily so in hot water, and freely soluble in boiling water. The temperature of the water should be therefore proportioned to the nature of the vegetable matter operated on. For mere 'demulcent infusions,' in which starch and gum are the chief substances sought to be dissolved out, and when the active principle is scarcely soluble in water, unless at nearly the boiling temperature, boiling water alone should be employed; but when the medicinal virtues of vegetables are soluble in water at lower temperatures, it is better to employ hot water (165° to 175° Fahr.), and to allow a little longer period for the digestion. In many cases temperate water (from 60° to 70° Fahr.), or tepid water (from 80° to 90° Fahr.), may be used with advantage, especially in the preparation of 'aromatic bitter infusions,' and in most cases where it is wished that the product should contain as little inert matter as possible; but when water at low temperatures is employed, the period of the maceration must be proportionately increased. By adopting the method of maceration in vacuo, or in an atmosphere of carbonic acid, the menstruum may be allowed to lay in contact with the vegetable matter for an unlimited period, without decomposition taking place.

Infusions, like decoctions, are liable to undergo spontaneous decomposition by keeping, especially in warm weather, when a few hours are often sufficient for their passage into a state of active fermentation; they should, therefore, when possible, be prepared for use daily, as beyond twenty-four hours they cannot be depended on. The London College directs a pint only to be made at a time, thus very properly regarding them as extemporaneous *preparations.*

of rectified spirit added to it, whilst still hot. The cork is then put in and secured down, and the whole agitated for some minutes, after which it is set aside for a week, when the clear portion is carefully decanted from the sediment for sale. Another method, which answers well with the aromatic bitter vegetables, is to take 8 times the usual quantity of the ingredients, and to exhaust them with a mixture of rectified spirits, 1 part, and distilled water, 3 parts; by digestion, or, better still, by percolation. Concentrated infusions made in this way keep well, and deposit scarcely any sediment. Many houses that are remarkable for the 'brilliancy' and beauty of these preparations, employ $\frac{1}{3}$ spirit of wine and $\frac{2}{3}$ water as the menstruum. It may, however, be taken, as a general rule, that for vegetable substances that abound in woody fibre, and contain little extractive matter soluble in water (as quassia, for instance), $\frac{1}{8}$ to $\frac{1}{6}$ part of spirit is sufficient for their preservation; whilst for those abounding in mucilage or fecula, or that readily soften and become pulpy and glutinous in weak spirit (as rhubarb), $\frac{1}{6}$ to $\frac{1}{3}$ is required.

By adopting the method originally suggested by Mr. Alsop, infusions may be preserved, uninjured, for a year or longer, without the addition of spirit or any other substance. The only precaution necessary is to keep them in bottles, perfectly filled and hermetically sealed.[1] Our own plan is to put a few bruised cloves or seeds of black mustard into the bottles, which must be only 2-3rds filled, then completely fill them with a condensed atmosphere of carbonic acid gas; and, lastly, to stopper them and seal them over, so as to perfectly exclude the air. A pint of decoction

viously beaten up with

Most of the vegetable infusio will readily pass the filter, af quantity of acetic, nitric, o has been added to them. Th may be rendered 'brilliant,' or as the 'cellarmen' call it, by s first with about a drachm of acid, and afterwards with the eggs, previously mixed with water, for each gallon of th plan is, however, objectionable dicinal preparations.

As many infusions which employed in medicine must ne being separately noticed in th be as well to remark that the vegetables that do not exert action on the human frame, as and roots, may be made by p boiling water on 1 oz. of the v and allowing it to macerate f an hour. The decoctions of tables may be made by sim above ingredients, in the same 10 or 15 minutes, instead o mere infusion. With substan greater activity, only half the should be taken; whilst, wit plants, and those possessing g to 2 drs. to water, 1 pint, wil quantity. The ordinary dose o and decoctions is $\frac{1}{2}$ to 1 wine- fl. oz.), two, three, or four tim case may indicate.

Infusion is preferred for all cate texture, which readily yi principles to water; and especi are either volatile or liable to ore the flowers are formed. Ver- e. A teacupful 3 or 4 times a day; an astringent gargle and lotion. use, an equal weight of liquorice s commonly added.

Infusion. *Syn.* INFUSUM ALKA- *Prep.* (Beasley.) Hickory ash, 1 oot, ½ pint; boiling water, 1 gall.; decant the clear. "A popular merica for dyspepsia with acidity."

f **Al'oes.** *Syn.* INFUSUM ALOËS, From hepatic or Socotrine aloes (in rs.; carbonate of potassa, 1½ dr.; r, 1 pint.

pound; INFUSUM ALOËS COMPO- -s. As the COMPOUND DECOCTION), but using only a pint of boiling

rgill.) Calumba and rhubarb, of aloes, 2 drs.; lime water, 16 fl. oz.; orseradish, 1 fl. oz.; macerate in r 12 hours, and strain. The last he decoction, are aperient, antacid, tonic, and emmenagogue.—*Dose.* onful to a small wine-glassful, in e last one is an admirable medicine a, loss of appetite, and troublesome a.

of **Amer'ican Calum'ba.** *Syn.* IN- ASSERÆ, L. From the dried root of alumba (*Frasera Carolinensis*). A erful, and excellent bitter, desti- oma, and fully equal to gentian.

of **Amer'ican Cen'taury.** *Syn.* IN- ATII, L. From the herb (*Sabbatia* A pure bitter tonic, without a- or aroma.

of **Amer'ican Sen'na.** *Syn.* INFU- E MARYLANDICÆ, L. *Prep.* (Mar- es of American or wild senna (*Cassia* s), 1½ oz.; coriander seed, 1 dr.; er, 1 pint. Purgative.

of **Angel'ica.** *Syn.* INFUSUM AN- From the root of garden angelica. omachic and diaphoretic; and, in aperient. It is a popular remedy a, flatulent colic, and heartburn.

of **An'iseed.** *Syn.* ANISEED TEA; NISI, L. Carminative; an excel- t to purgatives, to prevent griping; nfants to relieve colic, &c. Dr. mmends the use of water at 120° or

a'tic **Infusion.** *Syn.* INFUSUM TICUM, MISTURA ANTISCORBUTICA, Water trefoil (*Menyanthes trifo-* ; orange peel, 2 drs.; boiling water, fuse for 8 or 10 hours, strain, and pound spirit of horseradish, 5 fl. oz.

of **Ar'nica.** *Syn.* INFUSUM AR- 1. From the flowers of mountain erman leopard's bane (*Arnica mon-* therean orders 1 oz., Dr. Pereira Dr. A. T. *Thomson*, ½ *oz. of the* flowers to the pint. The first is the usual quantity. The dose of the first is a tablespoonful; of the second, ½ to 1 fl. oz.; of third, ½ to 1 wine-glassful.

2. (Compound; INFUSUM ARNICÆ COMPOSITUM, L.—Ph. Copenh.) Flowers of arnica, 1 dr.; peppermint, 2 drs.; chamomiles, ½ oz.; boiling water, ½ pint.—*Dose.* 1 fl. oz. As the last.

Infusion of Arnica-root. *Syn.* INFUSUM ARNICÆ RADICIS, L. *Prep.* (Ph. Castr. Ruth.) Arnica root, 40 grs.; water, 1 lb.—*Dose.* 1 fl. oz. As the above.

Astrin'gent Infusion. *Syn.* INFUSUM ASTRINGENS, MISTURA A., L. *Prep.* 1. From oak-bark.

2. Infusion of cusparia, 17 fl. oz.; tincture of catechu or kino, 1 fl. oz.; powdered ipecacuanha, 1 dr.; powdered opium, 12 grs.; mix. In diarrhœa, &c. It must be well shaken before pouring out the dose.

Infusion of Balm. *Syn.* INFUSUM MELISSÆ, L. *Prep.* (Plenck.) Fresh herb, 5 drs.; boiling water, 1 pint; infuse for 15 minutes.

Infusion of Bar'berry. *Syn.* INFUSUM BARBERIS, L. *Prep.* (Dr. Copland.) From the bark of the barberry shrub (*Berberis vulgaris*). In jaundice, biliary fluxes, and other cases where heat and acrimony prevail; either alone or combined with a little carbonate of soda or potassa, and tincture of calumba.

Infusion of Bark. See INFUSION OF CINCHONA.

Infusion of Bay-leaves. *Syn.* INFUSUM LAURI, I. LAURI NOBILIS, L. From the leaves or the berries of the sweet bay (*Laurus nobilis*). Aromatic, stimulant, and emmenagogue; in very large doses, emetic and poisonous. It is chiefly given in colic, flatulence, paralysis of the extremities, and obstructed menstruation.

Infusion of Beef. See ESSENCE, TEA, &c.

Infusion of Belladon'na. *Syn.* INFUSUM BELLADONNÆ, L. *Prep.* 1. (Dr. Paris.) Leaves of deadly nightshade (dried), 4 grs.; boiling water, 2 fl. oz.; for a dose.

2. (Compound;—Dr. Saunders.) Leaves (dried), ½ dr.; boiling water, 12 fl. oz.; infuse, strain, and to every 7 fl. oz. of the infusion add of compound tincture of cardamoms, 1 fl. oz.

Infusion of Bis'tort. *Syn.* INFUSUM BISTORTÆ, L. *Prep.* (Radius.) Bistort or snakeweed root (*Polygonum Bistorta*), ½ oz.; boiling water, 1 pint; infuse 2 hours, and strain. In passive hæmorrhages.

Infusion of Black Snake-root. *Syn.* INFUSUM CIMICIFUGÆ RACEMOSÆ, L. In dropsy, rheumatism, and chest complaints.

Infusion of Bles'sed Thistle. *Syn.* INFUSUM CARDUI BENEDICTI, L. From the whole herb. In small doses it is diaphoretic; in larger ones, tonic, stomachic, and deobstruent; taken warm, it is occasionally given to promote the action of emetics. The properties of carduus *benedictus* "are such as to lead us to the belief that it has been superseded by other not more efficacious remedies." (Lindley.)

Infusion of Blood-root. *Syn.* INFUSION OF PUCCOON; INFUSUM SANGUINARIÆ, L. *Prep.* Blood-root (*Sanguinaria Canadensis*), ½ oz.; boiling water, 1 pint. Stimulant and emetic.

Infusion of Blue Flag. *Syn.* INFUSUM IRIDIS VERSICOLORIS, L. *Prep.* 1. From the flowers of blue flag (*Iris versicolor*).—2. From the root or rhizomes. The first is used chiefly for its rich colour, as a test, &c.; the second is diuretic and cathartic, and apt to produce distressing nausea and prostration.

Infusion of Bone'set. *Syn.* INFUSUM EUPATORII, L. *Prep.* 1. (Ph. U.S.) From the dried leaves and flowers of boneset or thoroughwort (*Eupatorium perfoliatum*). Diaphoretic, nauseant, and emetic when warm; tonic when cold.

2. (Compound; INFUSUM EUPATORII COMPOSITUM, L.—Ellis.) Boneset and sage, of each, ½ oz.; cascarilla, 1 dr.; boiling water, 1½ pint; infuse until cold, and strain. In hectic fever. A wine-glassful of either of the above, given hourly, in these diseases, until perspiration and nausea are induced, has been highly recommended in influenza.

Infusion of Braz'il-wood. *Syn.* INFUSUM LIGNI BRASILIENSIS, L. From ground or rasped Brazil wood. When wanted to keep, rectified spirit, 3 fl. oz., is added to every pint. Used for colouring, and as a test.

Infusion of Broom. *Syn.* INFUSUM SCOPARII, L. See DECOCTION OF BROOM.

Infusion of Bu'chu. *Syn.* INFUSUM BUCHU (B. P.), I. BUCKU (Ph. E.), I. DIOSMÆ, L. *Prep.* 1. (B. P.) From bruised buchu leaves, 1 oz.; boiling distilled water, 1 pint: infuse for an hour and strain. Diuretic, sudorific, tonic; in dyspepsia, &c.; but chiefly in chronic affections of the bladder and urethra attended with copious secretion.—*Dose.* 1 to 2 oz.

2. (Compound; INFUSUM BUCHU COMPOSITUM, I. DIOSMÆ C., L.—Radius.) Leaves of buchu and whortleberry, of each, ½ oz.; boiling water, 8 oz. (say ½ pint); digest for half an hour, strain, and add of syrup of senega, ½ fl. oz.—*Dose.* 1 or 2 table-spoonfuls every hour; in atony of the bladder and mucous discharges.

Infusion of Buck'bean. *Syn.* INFUSUM MENYANTHIS, L. From the herb or root of buckbean or marsh trefoil (*Menyanthes trifoliata*). Bitter, stomachic, tonic, and diuretic; in large doses, purgative, vermifuge, and emetic. It has been recommended in agues, gout, dropsy, scurvy, worms, &c. The chief consumption of this plant is by the brewers; "2 oz. being equal to 1 lb. of hops." (Gray.)

Infusion of Bur'dock. *Syn.* INFUSUM BARDANÆ, L. From the root of common burdock. Aperient, diuretic, diaphoretic, and tonic; in gout, rheumatism, skin diseases, &c. See DECOCTION and EXTRACT.

Infusion of Calum'ba. *Syn.* INFUSUM CALUMBÆ (B. P.),—L. *Prep.* 1. (B. P.) Calumba,
in coarse powder, 1 oz.; cold d
2 oz.; macerate one hour, and
fusion of calumba is a good
machic bitter.—*Dose.* 1 to 3
pepsia, &c., and for restraining
diarrhœa during pregnancy or
is preferably joined with smal
carbonates of soda, potassa,
magnesia, when there is acid
chalybeates, when there is p
low pulse; with all of which
may be mixed without sufferin
alteration.

2. (Concentrated; INFUSUM
CENTRATUM, L.)—*a.* Calumba,
der, 5½ oz.; cold distilled wat
digest, with frequent agitatio
hours, then express the liquor,
digestion with 5½ fl. oz. more
after another hour, express th
using as much force as possible;
liquors, heat them quickly to th
in a shallow vessel, and pour
whilst still hot, into a strong b
it has cooled a little add of re
fl. oz., secure down the stoppe
agitate well for a few minutes;
now be set aside for a week, a
clear portion is to be decanted f
Very superior.

b. (Wholesale.) From calum
coarse powder), 5¼ lbs.; rectified
(diluted with) water, 12 pints
week, or proceed by displace
there be any difficulty in obt
from cloudiness, the whites of 4
viously mixed with about a
water, may be added to the i
after being well agitated for ab
must be allowed to repose for 7
then decanted from the dregs.
be perfectly transparent, it m
through blotting paper.—*Prod*

Obs. The concentrated infusi
the above formulæ is of very s
and has acquired an extensiv
wholesale trade. 1 part added
water makes a perfectly trans
possessing exactly similar virtu
SION OF CALUMBA—B. P.

Infusion of Canthar'ides. *Sy*
SPANISH FLIES; INFUSUM CA
LYTTÆ, L. *Prep.* (Soubeiran.)
(powdered), 20 grs.; boiling wa
3½ fl. oz.) to yield 3 fl. oz., after
filtration.

Infusion of Cap'sicum. *Syn.*
SICI, L. *Prep.* 1. (Pereira.)
dered), ½ oz.; boiling water, 1
fl. oz.

2. (Stephen's 'PEPPER MEDIC
Red pepper (*Capsicum fructe*
spoonfuls (or 3 of cayenne pe
salt, 2 teaspoonfuls; boiling wa
the strained liquor, when col
sharp vinegar, ¼ pint.—*Dose.* 1

d, every half hour, in cholera,
throat, scarlatina, &c.

ar'away. *Syn.* Caraway tea;
I, L. *Prep.* From bruised
drs.; boiling water, 1 pint. In
ic of infants, and as an adjunct
licine.

Car'rot Seed. *Syn.* Infusum
rræ, L. Diuretic; in dropsy
complaints; ½ to 1 pint being

ascaril'la. *Syn.* Infusum cas-
.), L. *Prep.* 1. (B. P.) Cas-
arse powder, 1 oz.; boiling
r, 10 oz.; infuse for one hour
vessel, and strain.—*Dose.* 1
ally combined with carbonate
incture of cascarilla. It is an
cine in dyspepsia, debility, diar-

rated; Infusum cascarillæ
m, L.)—*a.* Cascarilla (good and
sed), 6½ lbs.; rectified spirit of
cold water, 6 pints; macerate
d for 14 days, express the liquor,

st, but proceeding by the process
.

e preceding processes are well
product is 10 lbs., and resembles
olour and transparency, and is
fragrant. 1 part of this infu-
ith 6½ parts of water makes a
xactly resembling the infusion
—B. P.

e; Infusum cascarillæ alka-
—Ph. Palat.) Cascarilla, 3 oz.;
potassa, 2 drs.; boiling water, 16
cid and tonic.—*Dose.* 1 table-

Cas'sia. *Syn.* Cassia tea; in-
æ fistulæ, L.; Eau de casse,
Soubeiran.) Cassia pods (bruised),
; water, 1½ pint. Laxative.

Cat'echu. *Syn.* Compound in-
echu; Infusum catechu (B.P.),
. P.) Catechu in coarse pow-
; cinnamon, bruised, 30 grs.;
macerate for half an hour in a
l, and strain. Astringent in
ose. 1 to 2 oz. three or four
after every liquid dejection.

Cayenne Pep'per. See Infu-
ctum.

Cen'taury. *Syn.* Infusum cen-
rom the flowering tops of com-
entaury (*Erythræa centaurium*).
uge, stomachic, and vermifuge.
medy in obstructions, jaundice,
epsia, &c.; and externally, for
to destroy pediculi. An infusion
of the root, which is about one
werful than the tops. The plant
a native medicine; in the places
s it is carefully collected for use
macy." (*Lindley.*)

Infusion, Cephal'ic. *Syn.* Infusum cephalicum, L. *Prep.* (Edin. Hosp.) Valerian root, 2 oz.; rosemary tops, 4 drs.; boiling water, 1 quart; infuse 12 hours, strain, and add aromatic water, 4 fl. oz. As an antispasmodic, and in various affections of the head.

Infusion of Cham'omile. *Syn.* Chamomile tea; Infusum anthemidis (B. P.), I. chamæmeli, L.) *Prep.* 1. (B. P.) Chamomile flowers, ½ oz.; boiling water, 10 oz.; infuse for fifteen minutes, and strain.

Tonic, bitter, and stomachic; also emetic. It should be drunk cold, as it is emetic when warm.—*Dose.* As a stomachic, 1 to 3 oz.; as an emetic, 5 to 10 oz.

2. (Concentrated; Infusum anthemidis concentratum, L. From chamomiles, 5½ oz.; water, 1 pint; boil till the mixture weighs exactly 21 oz.; express the liquor by means of a powerful tincture-press, cool, and add of essential oil of chamomile, 15 drops, dissolved in rectified spirit, 5 fl. oz.; agitate well, let it repose until the next day, then decant the clear, and filter. Strongly bitter and odorous, and beautifully transparent. 5½ times as strong as the ordinary infusion—B. P.

Infusion of Cher'ry-laurel. *Syn.* Infusum lauro-cerasi, L. *Prep.* (Dr. Cheston.) Fresh leaves of the common or cherry-laurel (*Cerasus Lauro-cerasus*), 2½ oz.; boiling water, 1 pint; infuse, strain, and add of clarified honey, 2½ oz. As a lotion in cancer of the lip, and as a wash for malignant ulcers.

Infusion of Chiret'ta. *Syn.* Infusum chirattæ, L. *Prep.* 1. (B. P.) Chiretta, cut small, 1 oz.; distilled water, at 120° F., 40 oz.; infuse half an hour, and strain.—*Dose.* 1 to 2 oz.

Obs. Chiretta is a pure tonic bitter, closely allied to gentian, and has been long esteemed in the East Indies as a remedy for acidity, flatulence, and dyspepsia, especially when occurring in gouty or debilitated habits. It is usually given in combination with carbonate of soda or salts of iron. The whole of the plant is employed.

2. (Concentrated; Infusum chirettæ concentratum, L.) From chiretta, 4 oz.; for each pint of the product, prepared as either conc. infusion of calumba or cascarilla. Eight times as strong as the common infusion.

Infusion of Cincho'na. *Syn.* Infusion of bark; Infusum cinchonæ, L. *Prep.* 1. (B. P.) Yellow cinchona (calisaya) bark, in coarse powder, 1 oz.; boiling distilled water, 1 pint; infuse for 2 hours in a covered vessel, and strain.

Obs. Infusion of bark is tonic and stomachic, and in very large doses febrifuge. It is an extremely useful medicine in dyspepsia, debility, and during convalescences, and is often a valuable adjunct to more active remedies. Like the decoction, it is most energetic when strained whilst hot. The addition of 1 fl. dr. of diluted sulphuric acid to the water before pouring it on the bark increases its solvent power, and, consequently, the strength of the infusion.—*Dose.* 1 to 3 fl. oz.

2. (Concentrated; INFUSUM CINCHONÆ CONCENTRATUM, L.)—*a.* Yellow bark (coarsely powdered), 4 lbs.; boiling water, 8 lbs.; digest for 12 hours, express the liquid, add rectified spirit, 2 lbs., and after 24 hours' repose, decant the clear portion.

b. Yellow bark (in coarse powder), 4 lbs.; cold water, 8 lbs.; rectified spirit, 2 lbs; dilute sulphuric acid, 4 fl. oz.; mix the fluids, and either macerate the bark in them for a week in a closed vessel, or proceed by the method of displacement. Very superior.

Obs. 1 fl. dr. of either of the above, added to 7 fl. drs. of water, produces an extemporaneous infusion of cinchona resembling that of the pharmacopœia. The concentrated preparation of the Ph. L. being more than 8 times the usual strength, is placed amongst LIQUORS.

3. From PALE BARK:—*a.* (Ph. L.; INFUSION OF PALE CINCHONA; INFUSUM CINCHONÆ PALLIDÆ—Ph. L.) From pale bark, as INFUSION OF CINCHONA—Ph. L.

b. (Ph. D.; INFUSUM CINCHONÆ—Ph. D.) Crown or pale bark, 1 oz.; boiling water, ½ pint; infuse 1 hour in a covered vessel, and strain through paper.

Obs. "This infusion is inferior to the preceding" (from yellow bark) "in activity, and is a very unnecessary one. It is said to oppress the stomach less than that of the other cinchona bark; the reason is obvious—it is weaker." (Pereira.)

c. (Concentrated; INFUSUM CINCHONÆ PALLIDÆ CONCENTRATUM, L.) As CONCENTRATED INFUSION OF CINCHONA, but using pale bark. The concentrated preparation of the Ph. L. will be found under LIQUORS.

Infusion of Cin'namon. *Syn.* CINNAMON TEA; INFUSUM CINNAMOMI, L. In flatulence, dyspepsia, and nervous colics.

Infusion of Cloves. *Syn.* CLOVE TEA; INFUSUM CARYOPHYLLORUM, I. CARIOPHYLLI (B. P.), L. *Prep.* 1. (B. P.) Cloves (bruised), 1 oz.; boiling distilled water, 20 oz.; infuse for half an hour, and strain. Aromatic, stimulant, and stomachic, either alone or in combination; in colic, dyspepsia, gout, &c.—*Dose.* 1 to 2 oz.

2. (Concentrated; INFUSUM CARYOPHYLLI CONCENTRATUM, L.)—*a.* Bruised cloves, 3 oz.; boiling water, 16 fl. oz.; infuse as above and strain; when cold, add of rectified spirit, ¼ pint, and filter.

b. Bruised cloves, 1¼ lb.; rectified spirit, 1 quart; cold water, 3 quarts; macerate for 7 days, and express the liquid; sprinkle the marc with water, 12 fl. oz., and after the lapse of an hour, again submit it to the press; lastly, filter the mixed liquors. Very fine. The above are about 8 times the strength of the INFUSION OF CLOVES—Ph. L.

Infusion of Cof'fee. *Syn.* INFUSUM CAFFEI, L. *Prep.* (Dr. McBride.) Unroasted coffee berries (bruised), 30 in no.; cold water, 1 quart; macerate 2 or 3 hours. In calculus, &c.—*Dose.* ½ pint every morning.

Obs. Sir J. Floyer and Sir J. Pi
asthma with a strong solution of ro
M. Bouchardat prescribes a stro
made by displacement (percolation),
with a little brandy, in poisoning
and other like narcotics, after the
tion of emetics and ioduretted
Honore also employs very strong
in albuminuria. Clausen gives it i
Parker employs it as a nervous
lieu of ammonia and wine, for
slightly sensitive and excitable te

Infusion of Contrayer'va. *Sy*
CONTRAYERVÆ, L. *Prep.* (Perei
yerva (in powder), 1 oz.; boiling
fl. oz. Stimulant, tonic, and dia
low fevers, &c.

Infusion of Copal'che Bark. *Sy*
COPALCHI CORTICIS, L. *Prep.* (
Bark of copalche bush (*Croton ps*
½ oz.; boiling water, 1 pint; dig
and strain. A warm bitter and st

Infusion of Cor'sican Moss. *Sy*
HELMINTHOCORTI, L. *Prep.* (F
can moss, 5 drs.; boiling water, 1
rate for 10 or 12 hours, and strain.
in cancer. See DECOCTION.

Infusion of Cuspa''ria. *Syn.* I
ANGOSTURA BARK; INFUSUM CUSPA
I. ANGUSTURÆ, L. *Prep.* (B. P.)
in coarse powder, 1 oz.; distille
120°, 20 oz.; infuse 2 hours,
Stimulant and tonic; in typhus f
diarrhœa, dysentery, &c.

Infusion of Daf'fodil. *Syn.* IN
CISSI PSEUDO-NARCISSI, L. *Prep.* (
Flowers of daffodil (*Narcissus P*
cissus), 3 to 16 in no.; boiling w
Expectorant, nauseant and emetic.
cough.

Infusion of Dah''lia Pet'als. Fro
or blue varieties. Used for its co
a test.

Infusion of Dandeli'on. *Syn.* I
TARAXACUM; INFUSUM TARAXA
From the sliced root. Stimulant
and tonic.

2. (Concentrated; INFUSUM TA
CENTRATUM, L.) From the root (sl
exposed to a current of warm d
crisp, then coarsely pulverised, a
for a week in a mixture of rectifi
fl. oz.; cold water, 1½ pint. 8 tim
strength.

3. (Compound; INFUSUM TARA
POSITUM, L.—Meigs.) Infusion o
4 fl. oz.; extract of do., 2 drs.; sesq
of soda, ½ dr.; tartrate of potas
tincture of rhubarb, 3 fl. drs.; tinc
bane, 20 drops. In dropsical a
affections.—*Dose.* 1-3rd part, thric
DECOCTION, EXTRACT, &c.

Infusion of Digita'lis. See I
FOXGLOVE.

Diuret'ic Infusion. *Syn.* INFU
TICUM, L. Prep. 1. Broom t

1 pint; infuse 1 hour, strain,
of sweet spirits of nitre, 3 fl.
wine-glassful every other hour.
of foxglove, 1 fl. oz.; tincture of
dr.; acetate of potassa, 1 dr.;
drops.—*Dose*. 1 table-spoonful
a day, carefully watching the

berries, 2 oz.; aniseed, ¼ oz.;
1 pint; infuse 1 hour; strain,
d, add of compound spirit of
.; tincture of squills, 1 fl. dr.;
Dose. ½ a teacupful frequently.
are used as diuretics in dropsy.
OF BROOM, FOXGLOVE, and

Dog'wood. *Syn*. INFUSUM COR-
, L. From the bark of Ameri-
(*Cornus Florida*). See DECOC-

El'der Flowers. *Syn*. ELDER-
; INFUSUM SAMBUCI FLORUM, L.
ked flowers, ½ oz.; boiling water,
toral, expectorant, and diapho-
lone or sweetened with honey.

f El'ecampane. *Syn*. INFUSUM
Elm-bark. *Syn*. COMPOUND IN-
iaphoretic, expectorant, and tonic.
LM-BARK; INFUSUM ULMI COM-
Prep. (Cadet.) Elm-bark, bitter-
k, and fumitory, of each, 2 drs.;
r, 1 pint; digest for 4 hours,
ld of syrup of sarsaparilla, 1 oz.
be taken in 24 hours, in divided
chronic exanthemata. See DE-

Er'got of Rye. *Syn*. INFUSUM
P.), L. *Prep*. 1. (B. P.) Ergot, 1,
der, 1 oz.; boiling distilled water,
e ½ an hour in a covered vessel,
Should be made fresh when
ose. 1 to 2 oz. every ½ hour or hour,
ent. Also as an injection for

trated.) See LIQUOR OF ERGOT.

f Fen'nel. *Syn*. FENNEL TEA;
NICULI, L. *Prep*. From sweet
½ oz.; boiling water, 1 pint. In
windy colic of infants; a few
easpoonful for a dose, or a little
ema.

f Flax-seed. See INFUSION OF

f Fox'glove. *Syn*. INFUSUM DI-
P.), L. *Prep*. 1. (B. P.) Digi-
30 grs.; distilled water, 10 oz.;
, and strain.—*Dose*. ¼ to ½ oz.
E.) Foxglove (dried), 2 drs.;
r, 18 fl. oz.; spirit of cinnamon, 2

D.) Foxglove (dried and reduced
powder), 1 dr.; boiling water, 9
e 1 hour. The product should
ut 8 fl. oz. The last two are of
strength of the infusion Ph. L.,
must consequently be only 2 to 4 fl. drs. "I believe this, when properly made, to be the most effectual of the preparations of foxglove." (Pereira.) See FOXGLOVE.

Infusion of Fu'mitory. *Syn*. INFUSUM FUMARIÆ, L. From the herbaceous portion of common fumitory (*Fumaria officinalis*). Aperient and diaphoretic; in obstinate skin diseases and chronic obstructions of the liver.

Infusion of Galls. *Syn*. INFUSUM GALLÆ, L. 1. From Aleppo galls, coarsely powdered. In diarrhœa, hæmorrhages, &c.; also freely, in cases of poisoning by the alkaloids; and diluted with 3 or 4 times its volume of water, for injections, embrocations, gargles, &c.

2. (Compound; INFUSUM GALLÆ COMPOSITUM, MISTURA GALLÆ, L.—Ellis.) Infusion of galls, 4 fl. oz.; prepared chalk, ½ oz.; powdered gum, 1 dr.; tincture of opium, ½ fl. dr. —*Dose*. 1 table-spoonful every 2 hours, in diarrhœa, &c.

Infusion of Gar'lic. *Syn*. INFUSUM ALLII, L. *Prep*. (White.) Garlic (recent), ½ lb.; water, 4 lbs.; place them in a covered pot, set it in a very slow oven for 3 or 4 hours, and when cold, express the fluid portion.—*Dose*. In epilepsy, 2 teaspoonfuls before and after every meal; in chronic diarrhœa, a teaspoonful after every motion.

Infusion of Gen'tian. *Syn*. INFUSUM GENTIANÆ, L. *Prep*. 1. (Beral.) Gentian (bruised), 2 drs.; boiling water, 1 pint; infuse 5 or 6 hours, and strain. Stomachic.

2. (Compound; INFUSUM GENTIANÆ COMPOSITUM—B. P.)

Prep. *a*. (B. P.) Gentian, sliced, 1 oz.; orange peel, cut small, 1 oz.; lemon peel (fresh), 2 oz.; boiling distilled water, 1 pint; infuse for an hour in a covered vessel, and strain.—*Dose*. 1 to 2 oz.

b. (Ph. E.) Sliced gentian root, ½ oz.; bitter orange peel (dried and bruised) and coriander seeds, of each, 1 dr.; proof spirit, 4 fl. oz.; digest for 3 hours, then add of cold water, 16 fl. oz., and in 12 hours more strain.

c. (Ph. D.) Gentian and dried orange peel, of each, 2 drs.; boiling water, ½ pint; macerate 1 hour, and strain.—*Dose* of the last two, ½ to 1 fl. oz.

3. (Concentrated Compound; INFUSUM GENTIANÆ COMP. CONCENTRATUM, L.)—*a*. Gentian root (bruised), 4½ lbs.; boiling water, q. s. to cover it; infuse with occasional agitation for 2 hours, express the liquor, wash the marc with a little boiling water, and evaporate to 13 quarts; when cold, strain through flannel, add of rectified spirit, 1 gal., and pour the mixed fluids on dried orange peel, 4½ lbs., and fresh lemon peel, 9 lbs.; macerate for 1 week, then express the liquor in a powerful press, and filter through paper.

b. Gentian and dried orange peel, of each, 4½ lbs.; fresh lemon peel, 9 lbs.; cold distilled water, 13 quarts; rectified spirit, 1 gal.; macerate for 14 or 15 days, with frequent agitation, then express the liquid, add 1 dr. each of the essential oils of lemon and orange, agitate well, and filter through paper.

c. Gentian, 1¼ lb.; essence of lemon, 1 dr.; essence of orange, ½ dr.; essence of cedrat, 15 drops; rectified spirit, 1 quart; cold water, 3 quarts; digest for 10 days and filter.

4. (With RHUBARB; INFUSUM GENTIANÆ ET RHEI, MISTURA STOMACHICA, L.) From gentian and rhubarb (bruised), of each, 2 drs.; boiling water, 1 pint; digest 1 hour, and strain; to the cold infusion add of sesquicarbonate of ammonia, 1 dr. An admirable medicine in dyspepsia, hysteria, loss of appetite, constipation, chronic rheumatism, &c.

Infusion of Gin′ger. *Syn.* GINGER TEA; INFUSUM ZINGIBERIS, L. From the best unbleached Jamaica ginger, freshly bruised or grated. In flatulence, colic, and indigestion.

Infusion of Gin′seng. *Syn.* GINSENG TEA; INFUSUM GINSENG, I. RADICIS G., L. *Prep.* Ginseng (the root of *Panax Schinseng*), ½ oz.; ginger (grated), 1 dr.; boiling water, 1 pint; macerate 1 hour, then add of cinnamon (bruised), ½ dr.; infuse for another hour, and strain. Ginseng tea, made according to the above formula, has a wonderful reputation in China, as a stimulant, restorative, and aphrodisiac. In Europe, however, it is merely regarded as an aromatic demulcent.

Obs. American ginseng (the root of *Panax quinquefolium*) may be substituted for the Asiatic product.

Infusion of Gold′thread. *Syn.* INFUSUM COPTIS, L. From the root of *Coptis trifolia.* Bitter, stomachic; in dyspepsia, and as a mouth-wash in thrush.

Infusion of Gua′co. *Syn.* INFUSUM GUACO, L. From the bruised leaves and stems of guaco or huaco (*Mikania Guaco*). Sudorific and vulnerary; reputed in South America to be a powerful remedy for the bites of venomous serpents and for hydrophobia, but the trials in this country do not show it to be of any value in such cases.

Infusion of Guaiac′um. *Syn.* COMPOUND INFUSION OF GUAIACUM, I. OF THE WOODS; INFUSUM GUAIACI COMPOSITUM, AQUA BENEDICTA COMPOSITA, L. *Prep.* (Ph. D. 1826.) Guaiacum shavings, 6 oz.; bruised liquorice root, 1 oz.; sassafras bark, ½ oz.; coriander seeds, 3 drs.; lime water, 96 fl. oz. (say 5 pints); infuse for 2 days, and strain.—*Dose.* 3 to 4 fl. oz., twice or thrice a day, in scrofula, rheumatism, gout, eruptions, &c.

Infusion of Gum. *Syn.* INFUSUM ACACIÆ, L. From gum acacia and lump sugar, of each, 2 oz.; boiling water, 1 pint; macerate until dissolved, then cool, and add of orange-flower water, ½ fl. oz. A pleasant demulcent in coughs, hoarseness, &c.

Infusion of Hedge Hys′sop. *Syn.* INFUSUM GRATIOLÆ, L. *Prep.* (A. T. Thomson.) Hedge hyssop (*Gratiola officinalis*), dried, 2 drs.; boiling water, 8 fl. oz. Cathartic, diuretic, emetic, and vermifuge.—*Dose.* 3 to 6 fl.
drs.; in dropsies, gout, jau
EXTRACT.

Infusion of Hem′lock. *Syn.*
I. CONII MACULATI, L. *Prep*
Dried leaves of hemlock, and
of each, 2 drs.; boiling water,
2 hours. Combined with acet
tincture of henbane, and syr
pulmonary complaints, &c.

Infusion of Henbane. *Syn*
OSCYAMI, L. *Prep.* 1. From
oz.; boiling water, 1 pint.
painful ulcers, swelled face, &

2. (Compound; HENBANE
INFUSUM HYOSCYAMI COMPO
dius.) Henbane leaves, popp
lows, of each, 1 oz.; boiling
For painful ulcers, and in fac

Infusion of Hops. *Syn.* Ho
HUMULI, I. LUPULI (Ph. L.),
L.) Hops, 6 drs.; boiling d
pint; macerate for 4 hours in
(press), and strain. Tonic and
hopped mild ale is a good sub

Infusion of Hore′hound. *S*
TEA; INFUSUM MARRUBII,
leaves; demulcent, pectoral;
in coughs, colds, hoarseness,
tions generally, taken freely.

Infusion of Horserad′ish.
ARMORACIÆ, L. 1. From h
Diuretic and stomachic.

2. (Compound; INFUSUM A
POSITUM, L.—Ph. L.) Hor
and mustard seed (bruised),
boiling distilled water, 1 pint;
hours in a covered vessel, st
compound spirit of horseradish
lant, stomachic, and diureti
paralysis, scurvy, chronic rheu

Infusion of Hys′sop. *Syn.* I
FUSUM HYSSOPI, L. 1. Fro
Hyssopus officinalis (Linn.). S
chic, emmenagogue, and expe
pepsia, flatulency, hysterical
also used by boxers as a wash

2. (Compound; INFUSUM
POSITUM, L.—Ratier). Hysso
liquorice, 2 drs.; boiling wate
demulcent drink in catarrhal a

Infusion of Indian Sarsapar
FUSUM HEMIDESMI, L. From I
sarsaparilla (*Hemidesmus Ind*
burner orders it to be made
(cold); but this plan is seld
Dose and *uses*, same as thos
sarsaparilla,

Infusion of I′ron (Bitter).
FERRI AMARUM, L. *Prep.* (D
Iron filings, 3 oz.; gentian and
bruised, 1 oz.; orange peel, ½
cider, 1 pint; infuse for a m
stirring, and filter.—*Dose.* ½
times daily, as a chalybeate to

Infusion of Ju′niper. *Syn.*
PERI, I. BACCÆ J., L. 1. F

stimulant diuretic, in dropsies,

und; INFUSUM JUNIPERI COM-
)—a. (Guy's Hosp.) Juniper ber-
; boiling water, 1 pint; to the
tion, when cold, add, of compound
iper, 10 fl. drs.; bitartrate of po-

h.) Ginger, juniper berries, and
d, of each, bruised, ½ oz.; horse-
arsley root, of each, bruised, 1 oz.;
art; infuse, and strain with ex-
ll the above are used in dropsies.

f Ki'no. *Syn.* INFUSUM KINO, L.
5 drs.; boiling water, 1 pint. In
nd diluted with 4 or 5 times its
ter, as an injection in chronic

of Lime Flowers. *Syn.* LINDEN-
A; INFUSUM TILIÆ, L. 1. From
of the lime or linden tree (*Tilia*
Antispasmodic, diaphoretic, and

ound; INFUSUM TILIÆ COMPO-
-Foy.) Chamomiles, linden flowers,
leaves, of each, 2 drs.; boiling water,
ifuse, strain, and add of syrup, 2 fl.
vous headaches, &c. The above are
on the Continent.

of Lin'seed. *Syn.* LINSEED TEA,
T.; INFUSUM LINI (B. P.), L.
P.) Linseed (bruised), 160 grs.;
rice root (sliced), 60 grs.; boiling
ter, 10 oz.; infuse for 4 hours and
. cheap and useful demulcent in
and urinary irritation; especially
gonorrhœa, &c.; *ad libitum*. Dr.
ommends the addition of sliced
sugar-candy, to render it more
See DECOCTION.

f Liq'uorice. *Syn.* INFUSUM GLY-
L. From the fresh root, sliced.
and laxative; taken *ad libitum*.

f Lit'mus. *Syn.* INFUSUM LACMI,
r its colour, and as a liquid test,
s test-paper.

of Lobe'lia. *Syn.* INFUSUM LO-
INFLATÆ. From lobelia or Indian
n asthmas chiefly.—*Dose*. 1 to 2
uls every half hour, until it occa-
l.

f Log'wood. *Syn.* LOGWOOD TEA;
ÆMATOXYLI, L. From logwood
; of the best remedies known for
rhœa arising from weakness; also
colour and test. See DECOCTION,
&c.

(Maiden-hair). *Syn.* INFUSUM
. From either common maiden-
ntum *capillus Veneris*), or Canadian
r (*Adiantum pedatum*). They are
tly bitter, aromatic, and pectoral.
ion forms an excellent demulcent
tarrhs.

of Malam'bo Bark. *Syn.* *INFUSUM*
MALAMBO, L. Prep. (Ure.) Bark (from *Croton Malambo*), 2 drs.; boiling water 1 pint. An aromatic tonic and astringent.

Infusion of Mallow Flowers. *Syn.* INFUSUM MALVÆ FLORUM, L. Pectoral and laxative. Chiefly used as a test.

Infusion of Malt. *Syn.* MALT TEA, SWEET WORT; INFUSUM BYNES, I. MALTI, L. Prepared with hot water (165° to 170° Fahr.). Demulcent and laxative. A useful drink in sore throat, inflammatory fevers, &c. Some persons flavour it with sliced lemon.

Infusion of Ma''rygold. *Syn.* INFUSUM CALENDULÆ, L. From the flowers of the common marygold (*Calendula officinalis*). Carminative, diaphoretic, and emmenagogue. It has been recently recommended in cancerous affections, both internally and as a lotion. Radius adds syrup of orange peel to flavour it.

Infusion of Mat'ico. *Syn.* INFUSUM MATICONIS, I. MATICÆ, I. MATICO, L. 1. From the leaves of the matico plant (*Artanthe elongata*). Aromatic, bitter, stimulant, and reputed hæmostatic; in internal hæmorrhages and mucous discharges. The Indians of South America use it as an aphrodisiac. (Martius.)

2. (Compound; INFUSUM MATICONIS COMPOSITUM, L.—Watmough.) Matico and senna, of each, 2 drs.; boiling water, 1 pint. In hæmorrhagic and other discharges, piles, &c.; a wine-glassful repeatedly.

Infusion of May-weed. *Syn.* INFUSUM COTULÆ, L. From the dried flowers of mayweed or stinking chamomile (*Anthemis cotula*). Bitter, stomachic, and diaphoretic; in large doses, emetic and sudorific; chiefly in hysterical affections, scrofula, &c.

Infusion of Mea'dow Rue. *Syn.* INFUSUM THALICTRI FLAVI, L. From the herb meadow rue (*Thalictrum flavum*). In hydrophobia, taken plentifully.

Infusion of Mil'foil. *Syn.* YARROW TEA; INFUSUM MILLEFOLII, L. In dropsies, and as a fomentation to bruises. See EXTRACT, &c.

Infusion of Mint. *Syn.* MINT TEA. 1. (Ph. D.—INFUSUM MENTHÆ SIMPLEX.) From the dried leaves of green or spearmint. Carminative and stomachic; chiefly used as a vehicle for other medicines. A wine-glassful *ad libitum*.

2. (Compound; INFUSUM MENTHÆ COMPOSITUM.) To mint tea 6 fl. oz., add of oil of spearmint, 3 drops, previously triturated with lump sugar, 2 drs., and dissolved in compound tincture of cardamoms, ½ fl. oz. A useful remedy in colic, flatulence, &c.; as the last.

Infusion of Mu'dar. *Syn.* INFUSION OF MUDAR-BARK; INFUSUM CORTICIS MUDARIS, L. From the root bark of *Calotropis gigantea*. Resembles infusion of ipecacuanha.—*Dose*. 1 to 3 teaspoonfuls, as an alterative; a wine-glassful as an emetic. In the East Indies it is highly esteemed in epilepsy, hysteria, syphilis, convulsions, and various spasmodic diseases.

Infusion of Net'tle Seed. **Syn.** INFUSU

Infusion of Or'ange Peel. *Syn.* Infusum aurantii, B. P. *Prep.* 1. Dried bitter orange peel, cut small, 1 oz.; boiling water, 20 oz.; infuse for 15 minutes, and strain.—*Dose.* 1 to 2 oz. Bitter and stomachic.

2. (Compound; Infusum aurantii—Ph. E., I. a. compositum—Ph. L. & D., L.)—*a.* (Ph. L. & E.) Dried bitter orange peel, ½ oz.; fresh lemon peel, 2 drs.; cloves (bruised), 1 dr.; boiling distilled water, 1 pint; macerate for 15 minutes in a covered vessel, and strain.

b. (Ph. D.) Dried orange peel, 3 drs.; cloves, ½ dr.; boiling water, ½ pint; macerate half an hour. An agreeable stomachic. It is chiefly employed as a vehicle for other medicines.

c. (B. P.) Dried bitter orange peel, cut small, ½ oz.; fresh lemon peel, 120 grs.; cloves (bruised), 60 grs.; boiling water, 20 oz. Infuse for 15 minutes, and strain.—*Dose.* 1 to 2 oz.

3. (Concentrated Compound; Infusum aurantii concentratum, I. a. com. conc., L.)—*a.* Seville orange peel (dried), 3¼ lbs.; fresh lemon peel, 1½ lb.; bruised cloves, ¾ lb.; boiling water, 9 pints; infuse for 20 minutes, press out the liquor, and, when cold, add of rectified spirit, 1 quart, and filter.

b. Dried orange peel, 18 oz.; fresh lemon peel, ½ lb.; bruised cloves, ¼ lb.; rectified spirit, 1 pint; cold water, 3 pints; macerate for 1 week, press, and filter. Very superior.

Obs. 1 fl. dr. of either of the above, added to 7 fl. drs. of water, makes a similar (preferable) preparation to the compound infusion of orange peel.—Ph. L.

Infusion of Parei'ra. *Syn.* Infusum pareiræ (Ph. E. & D.), I. p. bravæ, L. *Prep.*

(sliced) and poppy-heads, or e
ing water, 1 pint; digest two h
In coughs, colds, hoarseness, d
with a dose of aperient medici
&c.

Infusion of Pennyroy'al.
royal tea; Infusum puleg
pulegii, L. A popular rem
flatulence, colds, hooping-co
affections, obstructed menstru

Infusion of Pep'permint. *S*
tea; Infusum menthæ pi
flatulence, colic, griping, &c.,
for other medicines.

Infusion of Periwin'kle.
vincæ minoris, L. From the
periwinkle (*Vinca minor*).
tonic; in diarrhœa, dysent
Weathers employs it in passi
and others have recommended i
tonic applied to the perinæu
relaxation of the genitals, &c.

Infusion of Persim'mon.
persimmonis, L. From the
mon (*Diospyros Virginiana*).
valuable in diarrhœa, hæmorrh
and as a gargle in ulcerated so

Infusion of Peru'vian Bark.
of Bark.

Infusion of Pink'root. *Syn.*
Worm t.; Infusum spigili
Indian pinkroot. Vemifuge;
with or followed by a purge af
fourth dose. The dose for a ch
old is 1 to 2 table-spoonfuls.

2. (Compound; Infusum
positum, I. s. cum sennâ, L.-
root, ½ oz., senna, 2 drs.; fen
manna, 1 oz.; boiling water,

VERIS, L. From poppy-heads paver somniferum). Soothing, etened with honey, it is a popu- ickling cough, restlessness, &c.; as an embrocation, in painful umations, &c. See INFUSION OF

Pur'ging Flax. *Syn.* INFUSUM CI, L. From the dried leaves x (*Linum catharticum*). Ca- lose should be repeated at in- our or an hour and a half, until

Quas'sia. *Syn.* QUASSIA TEA; SIÆ (B. P., Ph. L. E. & D.), L. P.) Quassia, in chips, 60 grs.; ater, 10 oz.; infuse for half an n.—*Dose.* 1 to 2 oz.

Quassia (sliced), 40 grs.; boiling , 1 pint; infuse for 2 hours in a and strain.

Quassia, 1 dr.; boiling water,

Quassia (rasped), 1 dr.; boiling L.

3.) Quassia, 2 drs.; cold water, cerate for 12 hours, and strain. ic, in loss of appetite, dyspepsia, mbined with alkaline carbonates . Sweetened with moist sugar orms a common FLY-WATER or

nd; INFUSUM QUASSIÆ COM- Ellis.) Quassia, serpentary, and eel, of each, ½ oz.; boiling water, nulant stomachic.

Red Cab'bage. *Syn.* INFUSION AGE. *Used* as a colour, and to er. It will not keep without ' about 1-10th of its weight of

Red Pop'py. *Syn.* RED-POPPY : RHŒADOS, L. From the petals orn poppy. Anodyne and pec- ned with sugar or honey, it is a r in catarrhal affections; but the well as of INFUSION OF POPPY- be accompanied by a dose of ine.

f Rhat'any. *Syn.* INFUSUM . P.), INFUSUM RHATANIÆ. I. a. L. & D.), L. *Prep.* 1. (B. P.), ised, 1 oz.; boiling distilled infuse 1 hour, and strain.—*Dose.*

Rhatany root, 1 oz.; boiling , 1 pint; macerate for 4 hours ssel, and strain.

Rhatany, ½ oz.; boiling water, cerate 1 hour, and strain. A- l tonic; chiefly in chronic

rated; INFUSUM KRAMERIÆ t, L.) From 8 times the usual gredients, as INFUSION ON CAS-

Infusion of Rhododen'dron. *Syn.* INFUSUM RHODODENDRI, L. From the leaves of yellow rhododendron (*Rhododendron chrysanthum*), ½ oz.; boiling water, ½ pint. Highly recommended by Pallas and Koelpin in gout, chronic rheumatism, and syphilis. It has marked narcotic properties.

Infusion of Rhubarb. *Syn.* INFUSUM RHEI (B. P., Ph. L. E. & D.), L. *Prep.* 1. (B. P.) Rhubarb (in thin slices, 1 oz.; boiling distilled water, 40 oz.; infuse for 1 hour, and strain. —*Dose.* 1 to 2 oz.

2. (Ph. L.) Rhubarb (sliced), 3 drs.; boiling distilled water, 1 pint; macerate for 2 hours in a covered vessel, and strain.

3. (Ph. D.) Rhubarb, 2 drs.; boiling water, 9 fl. oz.; macerate 1 hour.

4. (Ph. E.) Rhubarb (in coarse powder), 1 oz.; boiling water, 18 fl. oz.; infuse for 12 hours, add of spirit of cinnamon, 2 fl. oz.; and strain through linen or calico. Stomachic and purgative; along with neutral salts or aromatics.

Obs. The infusion of the Ph. E., being fully double as strrong as that of the Ph. L. & D., must be taken in proportionate doses.

5. (Concentrated; INFUSUM RHEI CONCENTRATUM, L.)—*a.* Rhubarb (in coarse powder), 10 oz.; rectified spirit, 1 pint; cold distilled water, 1 quart; digest 10 days, with frequent agitation, then express the liquor, and filter it; or proceed by the method of displacement.

b. Rhubarb, 3 lbs. 5 oz.; cold distilled water, 11 pints; rectified spirit, 5½ pints; as the last.

Obs. 1 fl. dr. of either of the above, added to 7 fl. drs. of water, forms 1 fl. oz. of liquid, resembling, and in many points preferable to, the infusion of the Ph. L. The above is the only way a fine, rich-coloured, and transparent concentrated preparation can be made, that will keep well. Should it not prove perfectly limpid, it may be clarified in the way already mentioned.

6. (Alkaline; INFUSUM RHEI ALKALINUM, I. R. CUM POTASSÂ, L.—Copland.) Rhubarb, 2 drs.; carbonate of potassa, 1 dr.; boiling water, ½ pint; macerate for 4 hours, strain, and add of tincture of cinnamon, ½ fl. oz. In dyspepsia, acidity, hearthburn, &c.

Infusion of Ro'ses. *Syn.* INFUSUM ROSÆ, L. 1. (Simple.) From the petals of red roses. *Used* as colouring and for a test; mixed with vinegar and sweetened with honey, it forms a popular gargle in sore throat.

2. (Compound; INFUSUM ROSÆ—Ph. E., I. ROSÆ COMPOSITUM—Ph. L., I. R. ACIDUM—B. P., Ph. D.) *Prep.*—*a.* Red rose petals (broken up), 1 oz.; dilute sulphuric acid, ½ oz.; boiling distilled water, 40 oz.; infuse for half an hour with the acid and water, and strain. —*Dose.* 1 to 2 oz.

b. (Ph. L.) Petals of the red or damask rose (dried and pulled asunder), 3 drs.; boiling water, 1 pint; mix, and add of dilute sulphuric acid, 1½ fl. dr.; macerate for 2 hours, *strain off* the liquor, and dissolve in it white sugar, 6 drs. The Edinburgh form is nearly similar.

c. (Ph. D.) Petals, 2 drs.; boiling water, ½ pint; infuse 1 hour, strain, and add of dilute sulphuric acid, 1 fl. dr.

Obs. A vessel of glass or stoneware should be used to make the infusion in, as metallic vessels injure the colour of the liquid, and are also attacked by the acid. The best plan is to add the dilute sulphuric acid to the water before pouring it on the leaves. The infusion may be squeezed out of the leaves with the hands.

The COMPOUND INFUSION OF ROSES is principally used as a vehicle for sulphate of quinine, saline purgatives, and some other medicines. It is astringent and refrigerant, and, when diluted with water, forms a pleasant drink in febrile disorders, phthisical sweats, hæmorrhages, diarrhœa, &c. It also makes a very useful astringent gargle.—*Dose.* 1 to 4 fl. oz.; either alone or diluted with water. It is incompatible with the alkalies and earths, and their carbonates and bicarbonates.

3. (Concentrated; INFUSUM ROSÆ CONCENTRATUM, L.)—*a.* Rose petals, 10 oz.; boiling distilled water, 3 pints; infuse for 2 hours, with frequent agitation, express the liquid, strain through a clean hair sieve, and add of dilute sulphuric acid, 4½ fl. oz.; after agitation for 5 or 6 minutes, and repose for 2 or 3 hours, decant the clear portion, and filter through paper supported on calico; next, dissolve in the liquid 1½ lb. of the finest white sugar, broken up into small lumps, but perfectly free from dust and dirt; lastly, pour the infusion into clean, stoppered, green-glass bottles, and, as much as possible, keep them from the light, and in a cool place.

b. Rose petals, 3½ lbs.; boiling water, 2 galls.; diluted sulphuric acid, 24 fl. oz.; finest white sugar, 6½ lbs.; as the last.

c. The same quantity of dilute sulphuric acid and cold water, as before; mix, and infuse the rose leaves in the liquid for 48 hours, then express, filter, and add the sugar. Product very fine, and keeps well without becoming gelatinous.

Obs. This preparation is 8 times as strong as that of the Ph. L. (2, *a*). Great care should be taken that the utensils are perfectly clean, especially the press, if one is employed; and earthenware glazed with lead should be avoided. The pressing should also be conducted as rapidly as possible, to avoid the colour being injured by the iron. Clean wrought iron does not readily injure the colour of infusion of roses before the addition of the acid. When the last formula is adopted, strong pressure of the leaves with the hands can alone be safely had recourse to. If the infusion does not filter quite clear though paper, it should be set aside for a few days, when, in general, it will be found to filter more readily and satisfactorily. Should it be wanted for immediate sale, the addition of the whites of 2 or 3 eggs, diluted

with 2 or 3 ounces of water, fol
lent agitation of the liquid for a
and repose for an hour or two,
render it 'fine,' when it may be ei
or filtered should it require it.
pass rapidly through ordinary fi
and at once run clear.

Infusion of Rue. *Syn.* RUE T
RUTÆ, L. Carminative, antispa
nagogue, and vermifuge. It is
useful remedy in flatulent colic,
vulsions, epilepsy, hysteria, suppre
ation, &c.

Infusion of Sage. *Syn.* SAG
FUSUM SALVIÆ, L. 1. From
common garden sage. Carmina
machic. In flatulence and dy
diluted with water as a drink,
night sweats in phthisis and feve
the secretion of milk after weani

2. (Compound; INFUSUM SA
SITUM, L.—Ellis.) Sage and bo
½ oz.; cascarilla, 1 dr.; boiling w
infuse until cold. A wine-glass
4 hours in hectic fever.

Infusion of Sarsaparil'la. *S*
SARZÆ, I. SARSAPARILLÆ (Ph.
From the bruised root. Dr.
½ fl. dr. of hydrochloric acid to
the water employed, as a menstru
he says, the efficacy of the infus
increased. At St. George's Ho
liquorice root and solution of po
for the same purpose.

2. (Compound; INFUSUM S
COMPOSITUM, L. — Ph. D. 1
parilla root (washed clean with
water, and sliced), 1 oz.; lime
16 fl. oz.; macerate for 12 hour
Inferior to the simple infusio
earths and alkalies lessen the
of water on sarsaparilla. *Use*
above, similar to that of the DEC

Infusion of Sas'safras. *Syn*
TEA; INFUSUM SASSAFRAS, L.
chips. Alterative, stimulant, an
popular remedy in various cutaneo
scrofulous, and syphilitical affec
land recommends the addition of
rice root.

Infusion of Sav'ine. *Syn.*
INFUSUM SABINÆ, L. *Prep.* (Pe
savine leaves or herb, 1 dr.; bo
fl. oz.; infuse in a covered vesse
emmenagogue, and vermifuge;
and suppressed menstruation d
torpid action of the uterine vesse
rheumatism, worms, &c.—*Dose.*
spoonfuls, cautiously administer

Infusion of Sax'ifrage. *Syn*
TEA; INFUSUM PIMPINELLÆ,
root of burnet saxifrage (*Pimpine*
Astringent; in diarrhœa, and e
wash to remove freckles.

Infusion of Scutella"ria. *Syn.*
TELLARIÆ, L. Prep. (Dr. Spal

laria lateriflora, in powder,
. boiling water, 1 pint. By
ce daily, to prevent hydro-

Sen'ega. *Syn.* Infusion of
root, Seneka tea; Infusum
, Ph. E.), I. polygalæ (Ph.
1. (B. P.) Senega, bruised,
istilled water, 20 oz.; infuse 1
.—*Dose.* 1 to 2 oz.
Senega snake-root (bruised),
g water, 1 pint; infuse for 4
red vessel, and strain.
Polygala root, ½ oz.; boiling
. Stimulant, expectorant, and
: alone or combined with am-
rrha, &c. See Decoction, Ex-

Sen'na. *Syn.* Senna tea; In-
(B. P., Ph. E.), I. sennæ com-
L. & D.), L. *Prep.* 1. (B. P.)
ginger, sliced, 30 grs.; boiled
, 10 oz.; infuse 1 hour, and strain.
½ oz.
..) Senna, 15 drs.; ginger
cruples; boiling water, 1 pint;
an hour in a covered vessel, and

Senna, 1½ oz.; ginger, 4 scrup.;
1 pint. (See No. 9, *below.*)
) Senna, ½ oz.; ginger, ½ dr.;
. ½ pint. Purgative.—*Dose.* 1 to
ls. It is usually given in doses
oz., combined with 3 to 6 drs. of
or other saline purgative, under
black draught.'
infusion is very apt to spoil in
r, to prevent which Mr. Squire
he addition of 1 gr. of nitrate of
h ounce.
ntrated; Infusum sennæ con-
..)—*a.* Senna, 2 lbs. 1 oz.; tepid
rt, macerate for 12 hours, fre-
ng with a stick, and express the
'marc,' add of tepid water, 1½
he maceration for 3 hours, and
the liquor with powerful pres-
se infusions, and after 2 hours'
the clear portion, and evaporate
s possible, by steam or a chloride
th, until it measures 1½ pint;
to a strong bottle, and when
add of rectified spirit, ½ pint;
er, 3½ oz.; macerate a week with
ation, and after repose for a few
the clear portion, and add dilute
, q. s. to make the whole measure
rt.
times the quantity of senna and
d in the Ph. L., put them into a
apparatus, either alone or mixed
ashed sand, and transmit water,
th part of rectified spirit, through
il the proper quantity of infusion

nda.) *Alexandrian senna (best),* 7 lbs.; unbleached Jamaica ginger (finest, bruised), 3 lbs.; rectified spirit and water, of each, 1 gal.; macerate for 14 days, press out the fluid, filter, and set it aside in a well-corked bottle; then take of good East India senna, 25 lbs.; and the 'pressings' or 'marc' from the tincture, and macerate in the least possible quantity (10 or 12 galls.) of cold distilled water, for 12 or 14 hours, employing frequent agitation with a wooden spatula; next press out the liquid, and again macerate the 'marc' in cold distilled water (5 or 6 galls.) for 2 hours; press, mix the two liquors, strain, heat gradually to the boiling-point, carefully separate the coagulated albumen, and afterwards evaporate as quickly as possible to exactly 9 quarts; put the liquid at once into a vessel capable of holding 5 gallons, bung close to exclude the air, and when nearly cold add the 'tincture' obtained from the Alexandrian senna and the ginger; the whole must now be well agitated together, and allowed to stand for a week, when the clear portion must be carefully decanted into bottles (Winchester quarts) for sale.

d. As the last, but employing hot water, and limiting the period of the infusions to 2 hours and 1 hour.

Obs. The preceding formulæ are at present employed in the wholesale trade, by nearly all those houses that are most noted for the superior quality of their 'concentrated infusions.' The products of the whole are excellent. That from *c* is very beautiful, and contains all the valuable active matter that it is possible to extract from the ingredients, under the circumstances. It also keeps well. The last one, like all preparations of senna made with hot water, is apt to drop a large deposit on standing, from which the last portion of the infusion is obtained with difficulty. They each furnish a liquid, of which 1 fl. dr. added to 7 fl. drs. of pure water forms 1 fl. oz. of a preparation precisely similar in medicinal qualities to the infusum sennæ comp.—Ph. L.

From the extreme bulkiness of senna, it has become a practice with certain unprincipled druggists to employ only ⅓ or ¼ of the proper quantity of that drug, and to add burnt sugar or treacle to bring up the consistence and colour, and alkaline solution of gamboge to impart the necessary purgative quality. Concentrated infusion of senna, as generally met with, is nearly worthless. This arises from either the employment of inferior senna, or the destruction of its active principle, by the lengthened exposure to heat and atmospheric oxygen during its manufacture.

6. (With coffee; Infusum sennæ cum caffeâ, L.)—*a.* (Foy.) Senna, 2 drs.; roasted coffee (ground), 1 dr.; boiling water and hot milk, of each, 3 fl. oz.; infuse for 12 hours (4?), and strain. For an adult; to be taken *in the morning fasting.*

b. (Guersand and Blake.) Senna, 10 to 30 grs. (according to age); hot coffee and hot milk, at will; infuse, and when cold, strain, and sweeten it with sugar, q. s. As a purge for children.

7. (With LEMON JUICE; INFUSUM SENNÆ LIMONIATUM, L.) From senna, 1½ oz.; fresh lemon peel, 1 oz.; lemon juice, 1 fl. oz.; boiling water, 16 fl. oz.; infuse.

8. (With RHUBARB; INFUSUM SENNÆ ET RHEI, L.—Ellis.) Senna, 6 drs.; manna, 1 oz.; rhubarb and cardamoms, of each (bruised), 2 drs.; boiling water, 1 pint; infuse 1 hour and strain.

9. (With TAMARINDS; INFUSUM SENNÆ COMPOSITUM—Ph. E., SENNÆ CUM TAMARINDIS, L—Ph. E.) Senna, 3 drs.; tamarinds, 1 oz.; coriander seeds, 1 dr.; sugar, ½ oz.; (if brown, 1 oz.); boiling water, 8 fl. oz.; infuse for 4 hours, with agitation, and then strain through calico. Pleasanter than the ordinary infusion of senna.

10. (With TARTAR; INFUSUM SENNÆ TARTARIZATUM, L.) From senna, 1½ oz.; coriander seeds, 4 drs.; cream of tartar, 2 drs.; boiling water, 16 fl. oz.

Infusion of Ser′pentary. *Syn.* INFUSUM SERPENTARIÆ (B. P., Ph. L. & E.), L. *Prep.* 1. (B. P.) Serpentary, bruised, 1 oz.; boiling distilled water, 40 oz.; infuse 2 hours, and strain.—*Dose.* 1 to 2 oz.

2. (Ph. L.) Serpentary or Virginian snake-root, ½ oz.; boiling distilled water, 1 pint; macerate for 4 hours in a closed vessel, and strain. The form of the Ph. E. is similar. As a stimulating expectorant and diaphoretic; in chronic catarrhs, low fevers, agues, &c.

3. (Compound; INFUSUM SERPENTARIÆ COMPOSITUM, L.—Guy's Hosp.) Virginian snake-root and contrayerva, of each, 5 drs.; boiling water, 1 pint; macerate 2 hours, strain, and when cold add of tincture of serpentary, 2 fl. oz. As the last.

Infusion of Simaru′ba. *Syn.* INFUSUM SIMARUBÆ (B. P., Ph. E. & D.), L. *Prep.* 1. (B. P.) Simaruba, bruised, 3 drs.; boiling water, 1 pint; infuse 2 hours, and strain.—*Dose.* 1 to 2 oz.

2. (Ph. E. & Ph. L. 1836.) Bark of the bitter simaruba or mountain damson, 3 drs.; boiling water, 1 pint; macerate 2 hours, and strain.

3. (Ph. D.) Simaruba bark, 2 drs.; boiling water, 9 fl. oz. Tonic, and, in large doses, emetic; in chronic diarrhœa and dysentery, either alone or combined with opium; and in agues, dyspepsia, &c.

4. (Compound; INFUSUM SIMARUBÆ COMPOSITUM, L.—Foy.) Simaruba bark and wormwood, of each, 2 drs.; boiling water, 1 pint; infuse for 15 minutes, strain, and add of syrup of gentian, 1 fl. oz. In agues and dyspepsia.

Infusion of Slip′pery Elm. *Syn.* INFUSUM ULMI (Ph. U. S.), I. U. FULVÆ, L. *Prep.* (*Ph. U. S.*) Inner bark of slippery elm (Ulmus *fulva*), 1 oz.; boiling water, 16
for 2 hours, and strain. Demul
Infusion of Soap-wort. *Syn.*
PONARIÆ, L. From soap-wort n
officinalis). Aperient and de
reputed alterative and antisyphil
Infusion of South′ernwood.
ERNWOOD TEA; INFUSUM ABROT
the herb southernwood or old m
Abrotanum). Antispasmodic, t
mifuge; in hysteria, difficult and
struation, worms, &c.

Stim′ulant Infusion. *Syn.* I
LANS, L. *Prep.* (Dr. Paris.)
seed (bruised) and dittander, o
boiling water, 16 fl. oz.; macera
strain, and when cold add of
volatile, 1 fl, dr.; spirit of pim
—*Dose.* 2 table-spoonfuls, 3 ti
palsy.

Infusion of Stink′ing Hel′leb
FUSUM HELLEBORI FŒTIDI, L.
ville.) Dried leaves of setter-wo
rus fœtidum, ½ dr. (or green
boiling water, 16 fl. oz.; macera
strain. Aperient and vermifuge
in large doses. It is chiefly use
large round worms of children
taken fasting.

Infusion of Suc′cory. *Syn.* C
INFUSUM CHICORII, L. From t
Aperient, deobstruent, and tonic
or sweetened with honey or suga

Infusion of Sweet Flag. *S*
TEA, SWEET-FLAG T.; INFUS
CALAMI AROMATICI, L. An ar
lant, tonic, and stomachic. See

Infusion of Tam′arinds. *Sy*
TAMARINDI, L. Cooling and lax
throat, febrile affections, &c., tak
See INFUSION OF SENNA.

Infusion of Tan′sy. *Syn.* TA
FUSUM TANACETI, L. From th
or the green herb, using double
Aromatic, bitter, tonic, and verm

Infusion of Tar. *Syn.* TAR
TEA; INFUSUM PICIS LIQUIDÆ,
(Ph. D.), L. *Prep.* 1. (Bisho
Wood tar, 1 quart; cold water,
with a stick for 15 minutes, th
tar to subside, strain, and kee
stoppered jars.

2. (Ph. D.) As the last.
extent of a pint daily in chronic
nephritic affections; also used
chronic cutaneous diseases, espec
the scalp in children. See DECO

Infusion of Tarax′acum. See
DANDELION.

Infusion of Tobac′co. *Syn.* TOB
INFUSUM TABACI, L. *Prep.* (P
Tobacco leaves, 1 dr.; boiling wa
macerate for an hour. Used fo
strangulated hernia, obstinate c
serving not to administer more
at a time; also as a wash to kill

m'ic. See INFUSIONS OF CA-
RILLA, GENTIAN, &c., also MIX-

Tre'foil. See INFUSION OF

u'lip-tree Bark. *Syn.* INFUSUM
L. From the bark of the tulip
dron tulipifera). Diaphoretic,
machic, and tonic; in dyspepsia,
lso used to flavour liquors.

Tur'meric. *Syn.* INFUSUM CUR-
sed as a test and to prepare test-
required for keeping, about 1-7th
of rectified spirit must be added.

Valer'ian. *Syn.* INFUSUM VA-
, Ph. L. & D.), L. *Prep.* 1. (B. P.)
ised, 120 grs.; boiling distilled
infuse 1 hour and strain.—*Dose.*

Valerian root, ½ oz.; boiling dis-
1 part; infuse for an hour in a
l, and strain.
) Valerian, 2 drs.; boiling water,
tispasmodic and nervine; in hys-
ndriasis, epilepsy, and low fevers.
und; INFUSUM VALERIANÆ COM-
) Yellow cinchona bark, 1 oz.;
oz.; boiling water, 1 pint; as
lebilitated nervous habits.

f Vanil'la. *Syn.* VANILLA TEA;
NILLÆ, L. *Prep.* Vanilla, 1½ dr.;
r, 1 pint. A stimulant antispas-
ysteria, rheumatism, anaphrodisia,
chiefly used as a flavouring for
nfectionery, &c.

f Vittie Vayr. *Syn.* VITTIE VAYR
SUM VETIVERIÆ, L. From the
ndropogon muricatus (VETIVER,
n, or CUSCUS). Antispasmodic,
, and stimulant, and, when warm,
and emmenagogue; in rheumatism,
febrile cases, &c.; and as a pro-
f cholera. See ESSENCE.

of Wall-pel'litory. *Syn.* INFUSUM
E, L. From the dried herb (*Parie-
inalis*). Aperient, diuretic, and pec-
asthmas, dropsies, calculous affec-

of Wal'nut Leaves. *Syn.* WALNUT-
; INFUSUM JUGLANDIS, L. From
leaves of the common walnut (*Juglans
lso from the inner wood-bark, and the
l of the fruit. See DECOCTION and

of Water-fen'nel. *Syn.* INFUSUM
DRII, L. *Prep.* (Bird.) Seeds of
nel, 5 drs.; boiling water, 1 pint.
to 4 fl. drs., to check excessive ex-
n.

of Whor'tleberry. *Syn.* INFUSUM
I, L. With alkalies, henbane, or
diseases of the urinary organs; and
ic acid and foxglove, in affections
. See DECOCTION and EXTRACT.
Infusum Uvæ Ursi of the Brit. Phar-

Infusion of Wild-cherry Bark. *Syn.* INFUSUM PRUNI VIRGINIANÆ (Ph. U. S.), L. *Prep.* (Ph. U. S.) Wild cherry-tree bark (*Prunus Virginiana* or *Cerasus Serotina*), ½ oz.; cold water, 16 fl. oz.; infuse 24 hours, and strain. A valuable tonic and febrifuge. Wild-cherry bark also exercises a sedative action on the circulatory and nervous system, and is much used in America in a variety of diseases.

Infusion of Wild Gin'ger. *Syn.* INFUSUM ASARI CANADENSIS, L. From the root of wild ginger or Canada snake-root (*Asarum Canadense*). A warm stimulant diaphoretic; in the same cases as INFUSION OF VIRGINIAN SNAKE-ROOT.

Infusion of Wil'low Bark. *Syn.* INFUSUM SALICIS, L. From the bark of the white or common willow (*Salix alba*). Astringent, tonic, and febrifuge; often used instead of INFUSION OF CINCHONA.

Infusion of Win'ter Green. *Syn.* INFUSUM PYROLÆ, I. CHIMAPHILÆ, L. Astringent, tonic, and diuretic; in dropsy, nephritic pains, and chronic affections of the urinary organs. It blackens the urine, like uva ursi. See DECOCTION.

Infusion of Wood Soot. *Syn.* SOOT TEA; INFUSUM FULIGINIS LIGNI, L. Antacid and stimulant. A similar preparation is also made from coal-soot, which is reputed antispasmodic and vermifuge.

Infusion of Worm'wood. *Syn.* WORMWOOD TEA; INFUSUM ABSINTHII, L. From the fresh tops of the plant, or from only half the quantity of the dried herb. In loss of appetite, dyspepsia, amenorrhœa, leucorrhœa, gout, worms, &c. See BITTERS.

INHALA'TION. *Syn.* INHALATIO, L. In medicine, the drawing in or inspiring of vapour with the breath. Inhalations (INHALATIONES) are vapours or gases imbibed for the purpose of medicating the mucous membrane of the air-passages. The substances that are to furnish the vapours or fumes are put into a vessel called an 'inhaler,' (see INHALER), which may be simply a small covered pot or mug of metal or glass, furnished with a short flexible tube, terminating in a small mouth-piece. In many cases even this simple apparatus may be dispensed with, and the fumes inhaled by holding the head over a vessel containing a little of the substance furnishing them; or, as with chloroform, a little may be dropped on a handkerchief or napkin, which is then held to the nose.

The following are the principal substances that are employed for inhalations at the present day:—

1. Carbonic acid gas and nitrous oxide; occasionally used in phthisis, by means of a bladder and mouth-piece.

2. Chlorine gas; exhibited by adding 5 or 6 drops of aqueous chlorine to the water (tepid) of the inhaler, which should be, in *this case*, of glass; employed in France for *phthisis, but seldom used in England.*

3. Chloroform; as an anæsthetic.

4. Vapour of iodine, administered in the same way as chlorine; occasionally used in phthisis.

5. Oxygen and hydrogen gases, either alone or diluted with air; employed in asthma and phthisis, by means of a bladder and mouthpiece.

6. Tar vapour, obtained by heating tar, mixed with a little carbonate of potash, over a spirit lamp, occasionally employed in bronchitis, and recommended by Sir A. Crighton in phthisis, but appears of little value in the latter.

7. Steam of hot water; in bronchitis, and to allay the cough in phthisis; small quantities of the seeds of henbane, opium, poppy-heads, &c., are frequently added to produce an anodyne effect. See CIGARS (in pharmacy), DISINFECTANTS, FUMIGATION, &c.

INJEC'TION. *Syn.* INJECTIO, L. In *medicine*, any liquid medicine thrown into a cavity of the body by means of a syringe or an elastic bag. Those thrown into the rectum are commonly called 'clysters' or 'enemata,' and are noticed under the head of ENEMA. The following are the principal injections employed in medical practice at the present day:—

Injection of Ac'etate of Ammo''nia. *Syn.* INJECTIO AMMONIÆ ACETATIS, L. *Prep.* (Ph. Chirur.) Solution of acetate of ammonia (Ph. L.), 1 part; water, 3 parts. Refrigerant.

Injection of Ac'etate of Cop'per. *Syn.* INJECTIO CUPRI ACETATIS, L. *Prep.* From verdigris, 10 grs.; oil of almonds (hot), 4½ oz.; triturate until dissolved, and strain. Detergent.

Injection of Ac'etate of Lead. *Syn.* INJECTIO PLUMBI ACETATIS, L. *Prep* 1. Sugar of lead, ½ dr.; distilled water, ½ pint.

2. (Dr. Collier.) Acetate of lead, 40 grs.; rose water, 8 fl. oz. Astringent and sedative. See SEDATIVE INJECTION.

Injection of Ac'etate of Zinc. *Syn.* INJECTIO ZINCI ACETATIS, L. *Prep.* 1. (Ellis.) Acetate of zinc, 8 grs.; rose water, 4 fl. oz.

2. (Brodie.) Sulphate of zinc, 1 dr.; sugar, of lead, 80 grs.; water, 1 pint; dissolve separately, mix, and filter. Astringent.

Injection, Alkaline. *Syn.* INJECTIO ALKALINA, I. LITHONTRIPTICA, L. *Prep.* (Chevallier.) Carbonate of soda, 1 dr.; Castile soap, 2 drs.; water, 12 fl. oz.; dissolve. In certain forms of calculus.

Injection of Al'um. *Syn.* INJECTIO ALUMINIS, L. *Prep.* 1. (Dr. Collier.) Alum, 18 grs.; rose-water, 6 fl. oz.; dissolve. For the urethra.

2. (Collier.) Alum, 3 drs.; water, 1 quart. For the vagina.

3. (Ph. Ch.) Alum, 4 grs.; rose-water, 4 fl. oz. The above are all astringent.

Injection of Ammo''nia. *Syn.* INJECTIO AMMONIÆ, L. *Prep.* 1. (Dr. Ashwell.) Liquor of ammonia, 1 to 2 fl. drs.;
In obstructed menstruation.

2. (Lavagna.) Liquor of am
drops; milk, 2 fl. oz. As th
daily, beginning with the lea
ammonia.

3. Liquor of ammonia, 1 fl.
1 oz.; water, 9 fl. oz. As the l

Injection of Ammo''nio-Sulph
Syn. INJECTIO CUPRI AMMONI
(Swediaur.) Ammonio-sulphate of
rose water, 8 fl. oz. In chronic

Injection of Bichlo''ride of
INJECTIO HYDRARGYRI BICHLO
1. Corrosive sublimate, 2 grs.;
oz.: hydrochloric acid, 1 drop.

2. Corrosive sublimate and sa
each, 5 to 10 gr.; waters, 1 pin

3. Sublimate, 5 grs.; rose w
Used to promote healthy actio
vent infection.

Injection of Cal'omel. *Syn.* I
MELANOS, I. HYDRARGYRI CHLO
(St. B. Hosp.) Calomel, 1 dr.;
oz.; water, ½ pint. Some person
mucilage.'

Injection of Car'bonate of L
JECTIO CERUSSÆ, I. PLUMBI C
Prep. (Hosp. F.) Carbonate o
levigated), ½ dr.; sulphate of zi
cilage, 1 oz.; rose water, 5 oz.
astringent.

Injection of Chlo''ride of Li
JECTIO CALCIS HYPOCHLORIS,
Chloride of lime, ½ dr.; water
tate well together, and filter.
fection.

2. (Detmold.) Chloride of li
coction of rhatany, 13 fl. oz.;
filter. In foul discharges, espec
or fœtid ulceration of the nose.

3. (Rousse.) Chloride of li
water, 7 fl. oz.; wine of opium
foul discharges, and to allay irri

Injection of Chlo''ride of So
JECTIO SODÆ HYPOCHLORIS, L.
solution of chloride of soda, 1
water, 3 fl. oz. As the last.

Injection of Chlo''ride of Zi
JECTIO ZINCI CHLORIDI, L. *Pre*
ride of zinc, 2 grs.; rose water
drochloric acid, 1 drop. In gon

Injection of Copai'ba. *Syn.*
PAIBÆ, L. *Prep.* 1. (Abernet
2 drs.; thick mucilage, 5 drs.
6 fl. oz.; make an emulsion.

2. (Plenck.) Copaiba, ½ oz.
q. s.; lime water, 6 fl. oz.; hone
As the last.

3. (Ricord.) Copaiba, 6 drs.
q. s.; decoction of poppies, 3 t
ulcers of the rectum, vagina,
and in gonorrhœa.

Injection of Cre'asote. *Syn.* I
SOTI, L. Prep. (Dr. Allnatt.)
drops; white sugar, 2 drs.; liq

ate, and add of water, 8 fl. oz.
and piles.
Cu'bebs. *Syn.* INJECTIO CU-
p. (Soubeiran.) Cubebs (in pow-
extract of belladonna, 1 dr.;
16 fl. oz.; infuse in a covered
rain. Stimulant and narcotic.
and leucorrhœa.
: the Ear. *Syn.* INJECTIO ACOUS-
p. 1. Ox-gall, 3 drs.; balsam of
mix. In hardened wax, dryness
s, &c.
lmonds or olives, 2 oz.; oil of
ops; tincture of castor, 1 fl. dr.;
phor, ½ dr.; laudanum, 3 drops;
ache and chronic deafness.
) Balsam of Peru, 2 drs.; tincture
r 5 drops; otto of roses, 1 or 2
tion of St. John's wort (warm), 16
ate together, and after repose
clear. In discharges from the

Yearsley states that drops and
r the ear should be used with very
s, and only under proper advice,
rwise often aggravate the ailment,
ring it.
f Er'got. *Syn.* INJECTIO ERGOTÆ,
ORNUTI, L. *Prep.* 1. (Boudin.)
; boiling water, 8 fl. oz.; infuse
When the urethra is highly sen-

illes.) Powdered ergot, 1 oz.; boil-
pint. Both the above are used in
ammation of the vagina, and in

of Gal'lic Acid. *Syn.* INJECTIO
CI, L. *Prep.* (Dunglison.) Gallic
water, 1 pint. In leucorrhœa.
f Galls. *Syn.* INJECTIO GALLÆ,
rom galls (bruised), 2 drs.; boiling
nt; infuse 1 hour, and strain.
in leucorrhœa.
f Hydrochlo''ric Aci'd. *Syn.* IN-
I HYDROCHLORICI, L. *Prep.*
hloric acid, 10 drops; soft water,
prevent and to remove recent
so to remove particles of lime and
e eye.
f Hydrocyan'ic Ac'id. *Syn.* IN-
I HYDROCYANICI, L. *Prep.* Me-
cyanic acid, 1 fl. dr.; soft water
nulsion, ½ pint. Anodyne; to allay
tability, both in chronic ophthal-
iorrhœa, and to relieve chordee;
es it must be used with caution,
argely diluted with water.
f Io'dide of I'ron. *Syn.* INJECTIO
I, L. *Prep.* 1. (Ricord.) Iodide
s.; water, 5 fl. oz. In gonorrhœa,
reasing the quantity of iodide.
ran.) Iodide of iron, 3 to 4 drs.;
t. In suppressed and painful
, leucorrhœa, &c. Both are a-
d well adapted to scrofulous pa-

Injection of I'odide of Potas'sium. *Syn.* INJECTIO POTASSII IODIDI, L. *Prep.* (Foy.) Iodide of potassium, 3 grs.; pure water, 1 pint. As a stimulant to fistulous sinuses and ulcers in persons of scrofulous habits.

Injection of I'odine. *Syn.* IODURETTED INJECTION; INJECTIO IODURETA, I. IODINII, L. *Prep.* 1. (M. Ameuille.) Tincture of iodine, 1 part; water, 5 or 6 parts. In refractory fistulæ.

2. (M. Bonnet.) Iodine, 1 part; iodide of potassium, 2 parts; water, 10 parts. In scrofulous hydrarthrosis, &c.

3. (Bransby Cooper.) Compound tincture of iodine, 2 fl. drs.; water, 6 fl. drs. In hydrocele.

4. (Guibourt.) Iodine, 4 grs.; iodide of potassium, 8 grs.; water, 1 pint. To stimulate fistulous sinuses.

5. (Velpeau.) Tincture of iodine, 1 fl. dr.; water, 3 fl. drs. In hydrocele.

Lithontrip'tic Injection. *Syn.* INJECTIO LITHONTRIPTICA, I. VESICALIS, L. *Prep.* (Dr. Hoskins.) Nitro-saccharate of lead, 1 gr.; saccharic acid, 5 drops; rub together, then add of distilled water, 1 fl. oz. As a solvent for phosphatic calculi. See ALKALINE INJECTION.

Mercu''rial Injection. *Syn.* INJECTIO MERCURIALIS, I. HYDRARGYRI, L. 1. *Prep.* 1. Quicksilver, 1 dr.; gum mucilage, 1½ oz.; triturate until the globules disappear, and gradually add of water, 1½ fl. oz.

2. (Hosp. F.) Quicksilver and balsam of copaiba, of each, 4 drs.; yoke of an egg; rose water, ½ pint. An awkward and useless preparation.

Injection of Mor'phia. *Syn.* INJECTIO MORPHIÆ, L. *Prep.* (Brera.) Morphia, 2 grs.; oil of almonds (warm), 1 oz.; triturate together until united. Anodyne and emollient. To ease the pain in ear-ache, acute gonorrhœa, piles, &c.

Injection of Nitrate of Sil'ver. *Syn.* INJECTIO ARGENTI NITRATIS, L. *Prep.* 1. (Acton.) Nitrate of silver, 3 grs.; distilled water, ½ pint; dissolve.

2. (Dr. Arnott). Nitrate, 12 grs.; water, 1 fl. oz.

3. (Dr. Collier.) Nitrate, 2 grs.; rose water, 1 fl. oz.

4. (Dr. Culverwell.) Nitrate, 20 to 30 grs.; water, 1 fl. oz.

5. (Dr. Jewell.) Nitrate, 12 grs.; water, 6 fl. oz.

6. (Ricord.) Nitrate, 8 grs.; water, 1 fl. oz.

7. (West. Hosp.) Nitrate, 1½ gr.; diluted nitric acid, 1½ minim; distilled water, 1 fl. oz.

Obs. The weaker solutions are used in chronic gonorrhœa, gleet, and leucorrhœa; those of an intermediate strength to prevent an attack of gonorrhœa following the incipient symptoms of that disease; and the strongest, chiefly in spermatorrhœa. Their use requires great caution.

Injection of Oak Bark. *Syn.* INJECTIO QUERCUS. *Prep.* (Univ. Hosp.) Alum, 6 grs.;

decoction of oak bark, 1 fl. oz. For the vagina. Astringent.

Injection of O′pium. *Syn.* INJECTIO OPII, I. OPIATA, L. *Prep.* 1. Tincture of opium or wine of opium, 1 to 2 fl. drs. (according to circumstances); water, 5 fl. oz. As an anodyne, in gonorrhœa.

2. (Foy.) Extract of opium, 6 grs.; extract of belladonna, 1½ dr.; decoction of wild lettuce, 16 fl. oz. In neuralgia and hæmorrhages.

Sed′ative Injection. *Syn.* INJECTIO SEDATIVA, L. *Prep.* (Hosp. F.) Oil of almonds, 1 oz.; solution of diacetate of lead, 20 drops. Cooling, sedative, and emollient.

2. (Wendt.) Aqueous extract of opium, 1½ gr.; mucilage, 2 drs.; solution of diacetate of lead, 4 drops; water, 2 fl. oz. Cooling, sedative, and anodyne.

3. (Gassincourt.) Simple emulsion, 5 fl. oz.; decoction of poppies, 16 fl. oz.; white of 1 egg; mix. In acute gonorrhœa.

Stim′ulating Injection. *Syn.* INJECTIO STIMULANS, L. *Prep.* (St. Marie.) Myrrh, 1 oz.; quicklime, 2 oz.; water, 1 quart; digest for 2 or 3 days, and decant the clear portion. In fistulous ulcers.

Injection of Sul′phate of Cop′per. *Syn.* INJECTIO CUPRI SULPHATIS, L. *Prep.* 1 Sulphate of copper, 5 grs.; rose water, 4 fl. oz. In chronic gonorrhœa.

2. (Hunter.) Sulphate of copper, 3 grs.; water, 4 fl. oz. As the last.

3. (Swediaur.) Sulphate of copper, 6 grs.; water, 4 fl. oz.; dissolve, and add solution of diacetate of lead, 20 drops. In phimosis.

Injection of Sul′phate of I′ron. *Syn.* INJECTIO FERRI SULPHATIS, L. *Prep.* (Berends.) Sulphate of iron and mucilage, of each, ½ dr.; sage water, 4 fl. oz.; dissolve. In nasal and uterine hæmorrhages.

Injection of Sul′phate of Zinc. *Syn.* INJECTIO ZINCI SULPHATIS. *Prep.* 1. (Hosp. F.) Sulphate of zinc, 2 grs.; water, 1 fl. oz.

2. (King's Coll.—INJECTIO COMMUNIS.)—*a.* Sulphate of zinc, 3 grs.; solution of lead, 20 drops; water, 1 fl. oz. For a man. *b.* Sulphate of zinc, 10 grs.; alum, 10 grs.; decoction of oak bark, 1 fl. oz. For a woman.

Injection of Sul′phuret of Potas′sium. *Syn.* INJECTIO POTASSII SULPHURETI, L. *Prep.* (Wedekind.) Sulphuret of potassium, 1 dr.; water, ½ pint. In gonorrhœa.

Injection of Tan′nic Acid. *Syn.* INJECTIO TANNINI, I. ACIDI TANNICI, L. *Prep.* (Béral.) Tannin, ½ dr.; distilled water, 8 fl. oz. (or better, ½ pint). In gleet and leucorrhœa.

Injection of Tea. *Syn.* INJECTIO THEÆ, L. *Prep.* (Hosp. F.) Green tea (or rough black tea), 1 dr. (say 2 teaspoonfuls); boiling water, ½ pint. Astringent; in gleet and fluor albus.

Vi′nous Injection. *Syn.* INJECTIO VINI RUBRI, I. VINOSA, L. *Prep.* (Earle.) Red wine, 1 part; water, 2 or 3 parts. In hydrocele.

INK. *Syn.* ATRAMENTUM, L. Coloured liquid employed for writing wi
is made of various substances
at present we shall confine our
tanno-gallic compounds, to wh
when standing alone, is alm
applied.

Prep. 1. Aleppo galls (well b
clean soft water, 1 quart; mac
corked bottle for 10 days or
even longer, with frequent agit
of gum arabic (dissolved in a
water, 1½ oz.; lump sugar, ½
and afterwards further add of
(green copperas, crushed small
tate occasionally for 2 or 3
ink may be decanted for use,
the whole is left to digest toge
weeks. When time is an objec
the ingredients may at once
bottle, and the latter agitated
ink is made; and boiling water
water may be employed. *Prod*
excellent ink, writing pale at
turning intensely black.

2. Aleppo galls (bruised), 12
6 galls.; boil in a copper ves
adding more water to make up
lost by evaporation; strain, an
galls with water, 4 galls.; for ½
off the liquor, and boil a third t
2½ galls., and strain; mix the
and while still hot, add of
(coarsely powdered), 4½ lbs.
(bruised small), 4 lbs.; agitate
and after defecation strain t
sieve, and keep it in a b
for use. *Prod.* 12 galls.;
durable.

3. Aleppo galls (bruised), 14 l
put them in a small cask, and
soft water, 15 galls.; allow the
rate, with frequent agitation, f
then further add of green coppe
solved in) water, 7 pints; again
agitate the whole once daily fo
Prod. Fully 15 galls. Resembl

4. Galls (bruised), 9 lbs.;
(best Campeachy), 3 lbs.; boil
the strained mixed liquors, add
and green copperas, of each (
4 lbs.; simmer or digest until
at once strain through a hair
store-cask or jars. *Prod.* 16½ g
but inferior to the preceding.

5. Galls (bruised), 2 lbs.;
green copperas, and gum, of eac
7 galls.; boil 2 hours, and st
galls. A superior ink for retail.

6. Galls (bruised), 1 lb.; lo
gum (common), 1 lb.; green
water, 8 galls.; proceed as last,
Common, but fit for all ordinary

The following formulæ are fo
advertised inks, or are those re
the authorities whose names
them:—

RROSIVE.) Same as 'Asiatic

) Galls, 4 lbs.; logwood, 2 lbs.;
eel, 1 lb.; soft water, 5 galls.;
2, then add to the strained and
r, when cold, of gum arabic,
gar or sugar candy, ¼ lb.; dis-
ter, 3 pints. *Prod.* 4¼ galls.
ut flows well from the pen, and
k.

) Galls, 6 oz.; green copperas
bic, of each, 4 oz.; soft water,
decoction.

l.) As No. 4 (nearly), adding
opper, ½ lb. Full coloured, but
and anticorrosive than the pre-

neaux.) Galls, 1 lb.; logwood
water, 6 quarts; boil 1 hour,
, add of sulphate of iron (cal-
ness), 4 oz.; brown sugar, 3 oz.;
cetate of copper, ¼ oz.; agitate
or a fortnight, then decant the
and cork up for use. Writes a
l otherwise resembles No. 10.

.) Galls (powdered), 42 oz.; gum
dered), 15 oz.; distilled or rain
rts; sulphate of iron (free from
.; liquor of ammonia, 3 drs.;
, 24 oz.; mix these ingredients in
l, stirring frequently until the
he desired blackness. This for-
o give a deep black, neutral ink,
corrode steel pens.

QUER.) Galls (bruised), 40 lbs.
gum, 10 lbs. (say 1 part); green
n, 9 lbs. (say 1 part); soft water,
45 parts); macerate for 3 weeks.
quent agitation. "This ink will
turies."

urt.) Galls (in powder), 50 parts;
0 parts; digest 24 hours, strain,
green sulphate of iron and gum
h 25 parts; when dissolved, add
g solution and mix well:—Sal-
parts; gum, 2 parts; oil of laven-
boiling water, 16 parts. Said to

.) This is a black and glossy
, which may be prepared from
above receipts by calcining the
il white or yellow, or by sprink-
powder) with a little nitric acid
g it to the decoction (preferably
by which the ink is rendered of a
soon as made. The glossiness is
g more gum. It flows less easily
than other inks, and is less dura-
that writes paler and afterwards
It is unfitted for steel pens.

) Bruised galls, 3 lbs.; gum and
n, of each, 1 lb.; vinegar, 1 gal.;
s; macerate with frequent agi-
days. To produce 3 galls. Fine
pt to act on steel pens.

GATIVE COURT.) Galls, 1 lb.; gum arabic, 6 oz.; alum, 2 oz.; green vitriol, 7 oz.; kino, 3 oz.; logwood raspings, 4 oz.; soft water, 1 gall.; macerate as last. Said to write well on parchment.

18. (Ribaucourt.) Galls, 1 lb.; logwood chips and sulphate of iron, of each ½ lb.; gum, 6 oz.; sulphate of copper and sugar candy, of each, 1 oz.; boil the first two in soft water, 2½ galls., to one half, then add the other ingredients. Full coloured, but somewhat corrosive, as No. 10.

19. (Dr. Ure.) Galls, 12 lbs.; green copperas and gum Senegal, of each, 5 lbs.; as No. 2 (nearly). To produce 12 galls.

20. (Dr. Wollaston.) Galls, 1 oz.; sulphate of iron, 3 drs.; gum, ½ oz.; cold water, ½ pint; put into a bottle and shaken together every day for a fortnight or longer. A good, durable ink, which will bear diluting.

General commentary. According to the most accurate experiments on the preparation of black ink, it appears that the quantity of sulphate of iron should not exceed ⅓rd part of that of the galls, by which an excess of astringent vegetable matter, which is necessary for the durability of the colour, is preserved in the liquid. Gum, by shielding the writing from the action of the air, tends to preserve the colour; but if much is employed, the ink flows languidly from quill pens, and scarcely at all from steel pens. The latter require a very limpid ink. The addition of sugar (especially of moist sugar) increases the flowing property of the liquid, but makes it dry more slowly, and frequently to pass into an acetous state, in which condition it acts injuriously on the pen. Vinegar, for a like reason, is not calculated for the menstruum, as it rapidly softens quill or horn, and corrodes iron and steel.

To ensure the permanency of the colour of the tanno-gallic inks, the best Aleppo or blue nut-galls must alone be used. No second or inferior quality should be employed. A contrary practice, often adopted for the sake of economy, is nearly always followed by unpleasant results, and often by considerable loss.

The only improvement of importance which has been made in the manufacture of writing ink from the common materials, during the last few years, is the practice of first roasting the gall-nuts, which is now adopted by a few of the houses most celebrated for their COPYING INK. In this way a portion of pyrogallic acid is formed, which is very soluble in water, and strikes an intense bluish-black colour with the protosulphate or green sulphate of iron. From galls so treated an ink may be made to write black at once. Care must, however, be taken to avoid any loss of materials by volatilization.

To prevent any tendency to mouldiness in ink, a few bruised cloves, or a little oil of cloves, or, still better, a few drops of creasote (carbolic acid) may be added. The last two *should be* previously dissolved in a small quantity of strong vinegar, or rectified spirit. With the same intention, some of the large makers allow the ink to become covered with a skin of 'mould' in the cask, to render it less liable to undergo the same change when subsequently bottled. Formerly, the practice was to add a little spirit for the same purpose.

Sumach, logwood, and oak-bark, are frequently substituted for galls in the preparation of common ink. When such is the case, only about ⅙th or ⅐th of their weight of copperas should be employed. Inks so made possess little durability.

The very general use of steel pens of late years has caused a corresponding demand for easy-flowing inks, many of which are now vended under the titles of WRITING-FLUID, STEEL-PEN INK, ANTICORROSIVE INK, &c. The greater number of these are prepared from galls in the preceding manner; but a less quantity of gum is employed, and greater attention is paid than heretofore to avoid every source of 'greasiness,' among which smoke and dirty utensils are, perhaps, the principal. The blue 'writing fluids,' which either maintain their colour or turn black by exposure to the air, are, in general, prepared from ferrocyanide of potassium, or from indigo, and are fully noticed in another place. COPYING INK, another variety of ink of recent introduction, is characterised by its suitableness to metallic pens, and by furnishing a transcript by means of the 'copying press' or 'copying machine.' (See *below*.)

The inks prepared by the first four of the above formulæ are very durable and limpid, and will bear dilution with nearly an equal bulk of water, and still be superior in quality to the ordinary inks of the shops. See GALLS, IRON, WRITING FLUID, and *below*.

Blue and Blue-black Ink. See WRITING FLUID.

Brown Ink. 1. A strong decoction of catechu; the shade may be varied by the cautious addition of a little weak solution of bichromate of potash.

2. A strong decoction of logwood with a very little bichromate of potash.

Chrome Ink. See GREEN INK and WRITING FLUID.

Col'oured Ink. Inks of various colours may be made from a strong decoction of the ingredients used in dyeing, mixed with a little alum or other substance used as a mordant, and gum arabic. Any of the ordinary water-colour cakes employed in drawing, diffused through water, may also be used as coloured ink. See BROWN, GREEN, and RED INKS, &c.

Cop'ying Ink. This is usually prepared by adding a little sugar or other saccharine matter to ordinary black ink, which for this purpose should be very rich in colour, and preferably made of galls prepared by heat, as noticed above. Writing executed with this ink may be copied within the space of 5 by passing it through a press (co in contact with thin unsized POST), slightly damped, enclosed sheets of thick oiled or waxed reversed transcript will be ob will read in proper order when the copy is turned upwards. In of a press, a copy may be taken, is good and the writing very ing the sheets, duly arranged on a the surface of a flat smooth table, as much force as possible, and slipping or crumpling of the paper. method is to pass a warm flat-iro paper laid upon the writing. The proportions are employed:—

1. Sugar candy or lump sugar, treacle or moist sugar, 1½ oz.; rich 1½ pint; dissolve.

2. Malt wort, 1 pint; evaporate consistence of a syrup, and then good black ink, 1½ pint.

3. Solazza juice, 2 oz.; mild ale, dissolve, strain, and triturate with (previously heated to dull redness in a vessel), ½ oz.; when the mixture is add of strong black ink, 1½ pint, and in 2 or 3 hours decant the clear.

Obs. After making the above mixt must be tried with a common steel pen, they do not flow freely, some more ink should be added until they are do so.

Gold Ink. From gold in the state impalpable powder, ground up with gum water. The brilliancy of the performed with this ink is considerab may be increased by burnishing.

Green Ink. 1. From sap green very weak alum water.

2. A strong solution of binacetate of in water, or of verdigris in vinegar.

3. (Klaproth.) Verdigris, 2 oz.; tartar, 1 oz.; water, ½ a pint; boil to and filter.

4. (Winckler.) Bichromate of pot parts; hot water, 8 parts; dissolve, rectified spirit, 4 parts, mix, and furthe of sulphuric acid, q. s. to liberate the acid, avoiding excess; next evaporate half, dilute with water, filter, and add filtrate rectified spirit, 4 parts, together 3 or 4 drops of sulphuric acid (if requir precipitate any remaining potash salt; decant and preserve the liquid until it a rich green colour.

5. A solution of recently precipitate drated oxide of chromium in liquor monia, diluted with distilled water, magnificent dark-green liquid, perfectly corrosive.

Horticul'tural Ink. *Prep.* 1. Chlo platinum, ¼ oz.; soft water, 1 pint; and preserve it in glass. Used with a quill to write on zinc labels. It almost

and cannot be removed by
dition of gum and lamp-
nded in certain books, is
en prejudicial to the quality

l sal ammoniac, of each,
lampblack, ½ oz.; common
x thoroughly. Used as the
, iron, or steel.
1 oz.; sal ammoniac ½ oz.
vinegar, ½ pint; dissolve.
k, or vermilion may be
necessary. As No. 1; for
plate. Some of the prepa-
elow under 'INCORRODIBLE
by gardeners and nursery-

nk. This name has been
preparations of a resinous
of resisting the action of

d linseed oil, ground with
ussian blue, of each, q. s. to
ck colour. It may be thinned
tine.
or amber varnish, coloured
ago or vermilion.
sphaltum (genuine), 1 part;
4 parts; colour (as last) q. s.
balt (in powder), 25 gr.; oil
gr.; dissolve by a gentle
lampback, 3 gr.; indigo 1
alpable powder); or vermil-

.) As No. 3 (nearly). Re-
of iodine, chlorine, alkalies,

e.) Asphaltum dissolved in
and oil of turpentine, and
mpblack.
ve are also frequently called
ndestructible inks.' They are
riting labels on bottles con-
acids and alkaline solutions.
are very permanent, and are
sting the action of iodine,
e lyes, and acids, together
rations of dyeing and bleach-
offer a cheap and an excellent
rking linen, &c., as they can-
off by any menstrua that will
e fabric. They must be em-
mps, types, or stencil plates, by
neatness will be secured than
d with either a brush or pen.
URAL INK, INDELIBLE INK, &c.
. *Syn.* INDESTRUCTIBLE INK.
pblack (previously heated to
a covered vessel), ½ oz.; tritu-
l black ink (gradually added),
s chlorine, weak acids, and
yes, in the cold.
.) Lampblack ground in a
oda, combined with a mixture
l caustic soda. *Said to be in-*
ble genuine China ink.

3. (Braconnot.) Dantzic potash, 4 parts; tanned leather parings, 2 parts; sulphur, 1 part; water, 20 parts; boil them in an iron vessel to dryness, then raise the heat (constantly stirring with an iron rod) until the whole forms a soft mass, observing that it does not ignite; next dissolve the mass in water, q. s., and filter the solution through a cloth. Flows freely from a pen, and resists the action of many chemical substances.

4. (CARBON INK.) Genuine Indian ink, rubbed down with good black ink until it will flow easily from a pen. Resists chlorine, oxalic acid, and ablution with a hair pencil or sponge.

5. (Coathupe.) Borax, 1 oz.; shell-lac, 2 oz.; water, 18 fl. oz.; boil in a covered vessel until dissolved, strain, add of thick mucilage, 1 oz., and triturate it with levigated indigo and lampblack, of each, q. s. to give a good colour. After 2 hours' repose, decant it from the dregs, and bottle for use. Resists moisture, chlorine, and acids.

6. (FRENCH.)—*a.* From Indian ink, diffused through water acidulated with hydrochloric acid. For quills.—*b.* From Indian ink diffused through water slightly alkalized with liquor of potassa. For metallic pens.

7. (Herberger.) Wheat gluten (free from starch), q. s., is dissolved in weak acetic acid of good pure vinegar, 4 fl. oz.; lampblack (best), 10 or 12 gr.; indigo, 2 or 3 gr.; and oil of cloves, 1 or 2 drops, are then added, and the whole is thoroughly incorporated together. The product is inexpensive, has a beautiful black colour, and resists the action of water, chlorine, and weak acids.

Obs. The products of the above formulæ, though called 'indelible ink' and 'indestructible ink,' are in reality only indelible as compared with common writing ink, as they may all be removed with more or less facility by chemical reagents, assisted by mechanical means. They are intended chiefly for paper, pasteboard, and parchment. No 5 is also used for glass and metal. See MARKING INK.

In'dian Ink. *Syn.* CHINA INK; ATRAMENTUM INDICUM, L. *Prep.* 1. Lampblack (finest) is ground to a paste with very weak liquor of potassa, and this paste is then diffused through water slightly alkalized with potassa, after which it is collected, washed with clean water, and dried; the dry powder is next levigated to a smooth, stiff paste, with a strong filtered decoction of carrageen or Irish moss, or of quince seed, a few drops of essence of musk, and about half as much essence of ambergris being added, by way of perfume, towards the end of the process; the mass is, lastly, moulded into cakes, which are ornamented with Chinese characters and devices, as soon as they are dry and hard.

2. A weak solution of fine gelatine is boiled at a high temperature in a Papin's digester *for 2 hours,* and then in an open vessel for *1 hour more;* the liquid is next filtered and

evaporated to a proper consistence, either in a steam or salt-water bath; it is, lastly, made into a paste, as before, with pure lampblack which has been previously heated to dull redness in a well-closed crucible. Neither of the above gelatinize in cold weather, like the ordinary imitations.

3. (Gray.) Pure lampblack made up with asses'-skin glue, and scented with musk.

4. (Merimée.) Dissolve superfine glue in water, add a strong solution of nut-galls, and wash the precipitate in hot water; then dissolve it in a fresh solution of glue, filter, evaporate to a proper thickness, and form it into a paste as before, with purified lampblack.

5. (Proust.) As No. 1 (nearly).

6. Seed-lac, ½ oz.; borax, 1½ drs.; water, ½ pint; boil to 8 oz., filter, and make a paste with pure lampblack, as before. When dry, it resists the action of water.

Obs. The Chinese do not use glue in the preparation of their ink, but an infusion or decoction of certain seeds abounding in a glutinous transparent mucilage, which at once imparts brilliancy and durability to the colour. Starch converted into gum by means of sulphuric acid, or 'British gum,' has been recommended as a substitute. (M. Merimée.) Indian ink is chiefly employed by artists, but it has been occasionally given as a medicine, dissolved in water or wine, in hæmorrhages and stomach complaints. *Dose.* 1 to 2 drs.

Lithograph'ic Ink. *Prep.* 1. Mastic (in tears), 8 oz.; shell-lac, 12 oz.; Venice turpentine, 1 oz.; melt together; add, of wax, 1 lb.; tallow, 6 oz.; when dissolved, further add of hard tallow soap (in shavings), 6 oz.; and when the whole is perfectly combined add of lampblack, 4 oz.; lastly, mix well, cool a little, and then pour it into moulds, or upon a slab, and when cold cut it into square pieces.

2. (Lasteyrie.) Dry tallow soap, mastic (in tears), and common soda (in fine powder), of each, 30 parts; shell-lac, 150 parts; lampblack, 12 parts; mix as last. Both the above are used for writing on lithographic stones.

3. (AUTOGRAPHIC.)—*a.* Take of white wax, 8 oz., and white soap, 2 to 3 oz.; melt, and when well combined, add of lampblack, 1 oz.; mix well, heat it strongly, and then add of shell-lac, 2 oz.; again heat it strongly, stir well together, cool a little, and pour it out as before. With this ink lines may be drawn of the finest to the fullest class, without danger of its spreading, and the copy may be kept for years before being transferred.

b. From white soap and white wax, of each, 10 oz.; mutton suet, 3 oz.; shell-lac and mastic, of each, 5 oz.; lampblack, 3½ oz.; mix as above. Both the above are used for writing on lithographic paper. When the last is employed, the transfer must be made within a week.

Obs. The above inks are rubbed down with a little water in a small cup or saucer for use, in the same way as common
cakes or Indian ink. In winter t
should be performed near the
saucer should be placed over a b
ing a little tepid water. Either
a camel-hair pencil may be em
the ink. See LITHOGRAPHY.

Mark'ing Ink. *Syn.* INDELI
MANENT I. Of this there are sev
of which the following are the
and commonly used:—

1. Nitrate of silver, ½ oz.;
water, 7 fl. drs.; dissolve, add of
oz.; previously rubbed with sap g
of buckthorn, q. s. to colour. T
be first moistened with 'liquid po
preparation,' as it is commonl
when it has again become dry
with a clean quill pen. The
dilution if the writing is not
black.

The POUNCE OR PREPARATION
of carbonate of soda, 1½ oz.; in
slightly coloured with a little
syrup of buckthorn, to enable th
with it to be afterwards known.

2. (WITHOUT PREPARATION.)
trate of silver, ¼ oz.; water, ¾
add as much of the strongest
monia as will dissolve the preci
on its first addition, then furth
cilage, 1½ dr., and a little sap g
buckthorn, or finely powdered in
Writing executed with this ink
on being passed over a hot It
held near the fire.

3. Terchloride of gold, 1½
fl. dr.; mucilage, 2 dr.; sap g
colour. To be written with on
pared with a weak solution of p
tin, and dried. Dark purple.

4. (Rev. J. B. Reade.) Nit
1 oz., tartaric acid (pure), 3 d
rated together in a mortar, in
a little water is then added, by
of tartrate of silver are formed,
acid set free; the latter is then
liquor of ammonia, sufficient b
dissolve all the newly formed ta
avoiding unnecessary excess;
gum and colouring matter is ad

5. (Rev. J. B. Reade.) To t
an ammoniacal solution of a salt
Reade has used for this purpose
Cassius,' the hyposulphate, the a
the ammonio-periodide of gold,
compound of gold which is solu
will do as well. This ink is
nearly all those reagents which
executed with solutions of the
alone, as cyanide of potassium,
of lime and soda, &c.

6. (Redwood.) Nitrate of s
bitartrate of potassa, of each 1
are rubbed together in a glass
ware mortar, and after a shor

oz. (16 parts, or q. s.), is added;
olution is complete, archil, 4 drs.
; white sugar, 6 drs. (or 3 parts);
ed gum, 10 drs. (or 5 parts), are
the liquor, after which sufficient
dded to make the whole measure
oz., when it is ready to be bottled
he last three are used in the same
No. 2.

Smellie.) From sulphate of iron,
milion, 4 drs.; boiled linseed oil, 1
ated together until perfectly smooth.
type.

eiran.) Nitrate of copper, 3 parts;
of soda, 4 parts; nitrate of silver,
mix, and dissolve in liquor of am-
parts. *Used* like No. 2.

.) A strong solution of chloride of
with a little potassa, and sugar and
icken.

fluid contained between the kernel
of the cashew nut. On linen and
turns gradually black, and is very
This has been called ANACARDIUM
-NUT INK.

phate of manganese, 2 parts; lamp-
part; sugar, 4 parts; all in fine
d triturated to a paste with a little
Used with types or stencil-plates;
when dry, being well rinsed in water.

ck oxide of manganese and hydrate
are mixed, heated to redness in a
and then triturated with an equal
pure white clay, and water, q. s. to
ue consistence. *Used* like the last.

he products of the first two of the
mulæ constitute the marking ink of
. They have, however, no claim to
of 'INDELIBLE INK,' "which no art
act without injuring the fabric"—as
ally represented. On the contrary,
be discharged with almost as much
common iron-moulds. This may
and cheaply effected by means of
cyanide of potassium, the chlorides
and soda, and some of the hyposul-
without in the least injuring the tex-
the fabric to which they may be
The only precaution required is
sing the part in clean water imme-
ter the operation. The 'marking ink
preparation' is more easily extracted
'with preparation.' The former has
disadvantage of not keeping so well
tter, and of depositing a portion of
ng silver, under some circumstances,
nders its use dangerous. The thinner
intended to be used with type or
e thickened by adding a little more
ome sugar.

ng Ink. *Syn.* PACKER'S INK. Ink
Used by packers for marking bales,

al Ink. *Prep.* 1. Pitch, 3 lbs.; melt over the fire, and add of lampblack, ¾ lb.; mix well.

2. Trinidad asphaltum and oil of turpentine, equal parts. *Used* in a melted state to fill in the letters on tombstones, marbles, &c. Without actual violence, it will endure as long as the stone itself.

Print'er's Ink. See PRINTING INK.

Pur'ple Ink. A strong decoction of logwood, to which a little alum or chloride of tin has been added.

Red Ink. *Prep.* 1. Brazil wood (ground), 4 oz.; white-wine vinegar (hot), 1½ pint; digest in glass or a well-tinned copper or enamel saucepan, until the next day, then gently simmer for half an hour, adding towards the end gum arabic and alum, of each ½ oz.

2. Ground Brazil wood, 10 oz.; white vinegar, 10 pints; macerate for 4 or 5 days; then boil as before to one half, and add of roach alum, 4½ oz.; gum, 5 oz.; and when dissolved, bottle for use.

3. As the last, but using water or beer instead of vinegar.

4. Cochineal (in powder), 1 oz.; hot water, ½ pint; digest, and when quite cold, add of spirit of hartshorn, ½ pint (or liquor of ammonia, 1 oz., diluted with 3 or 4 oz. of water); macerate for a few days longer, and then decant the clear. Very fine.

5. (Buchner.) Pure carmine, 20 gr.; liquor of ammonia, 3 fl. oz.; dissolve, then add of powdered gum, 18 grs. Half a drachm of powdered drop lake may be substituted for the carmine where expense is an object. Colour superb.

6. (Henzeler.) Brazil wood, 2 oz.; alum and cream of tartar, of each, ½ oz.; rain water, 16 fl. oz.; boil to one half, strain, add of gum (dissolved), ½ oz.; and when cold, further add a tincture made by digesting powdered cochineal, 1½ dr., in rectified spirit, 1½ fl. oz.

7. (Redwood.) Guarancine and liquor of ammonia, of each, 1 oz.; distilled water (cold), 1 pint; triturate together in a mortar, filter, and dissolve in the solution, gum arabic, ½ oz.

Se'pia Ink. See SEPIA.

Sil'ver Ink. From silver leaf or powdered silver, as GOLD INK.

Sympathet'ic Ink. *Syn.* DIPLOMATIC INK, INVISIBLE I. Fluids which, when used for writing, remain invisible until the paper is heated, or acted on by some other chemical agent. Sympathetic inks have been frequently employed as the instruments of secret correspondence, and have often escaped detection; but by heating the paper before the fire until it begins to grow discoloured by the heat, the whole of them may be rendered visible.

The following are the most common and amusing sympathetic inks:—1. Sulphate of copper and sal ammoniac, equal parts, dissolved in water; writes colourless, but turns YELLOW when heated.—2. Onion juice; like the last—2. A weak infusion of galls; turns BLACK when moistened with weak copperas water.

muriate of cobalt; turns GREEN when heated, and disappears again on cooling. If the salt is pure, the marks turn BLUE.—8. Solution of acetate of cobalt, to which a little nitre has been added; becomes ROSE COLOURED when heated, and disappears on cooling.—9. A weak solution of the mixed chlorides of cobalt and nickel; turns GREEN. The last three are about the best of our sympathetic inks.—10. Solution of acetate of lead; turns BROWNISH-BLACK when exposed to the fumes of sulphuretted hydrogen.—11. A weak solution of nitrate of mercury; turned BLACK by heat and sulphuretted fumes.—12. Rice water or decoction of starch; turned BLUE by a solution of iodine in weak spirit, and by the fumes of iodine, if the paper is first slightly moistened by exposure to steam or damp air.

Vi'olet Ink. The same as PURPLE INK, but weaker.

Yel'low Ink. 1. From gamboge (in coarse powder), 1 oz.; hot water, 5 oz.; dissolve, and when cold, add of spirit, ¾ oz.

2. Boil French berries, ½ lb., and alum, 1 oz., in rain water, 1 quart, for half an hour, or longer, then strain and dissolve in the hot liquor gum arabic, 1 oz.

INK POW'DERS. *Prep.* 1. Aleppo galls, 4 oz.; sulphate of iron, 1⅓ oz.; gum arabic, 1 oz.; lump sugar, ¾ oz.; (all quite dry and in powder); mix, and divide into 3 packets. A pint of boiling water poured over one of them produces, in a few hours, a pint of excellent ink.

2. Aleppo galls, 3 lbs.; copperas, 1 lb.; gum arabic, ½ lb.; white sugar, ¼ lb.; all in powder; mix, and divide into two-ounce packets, to be used as the last. Ink powders are very useful in travelling.

attained through a series o
In general, every insect po
wings; the trunk in the
usually composed of 3 chief
thorax, and abdomen. The
may also be described as con
ments, of which 1 constit
constitute the thorax, and
Insects are arranged in the
—1. *Hymenoptera*, includin
neumon-flies, &c.—2. *Cole*
all those kinds commonly
Neuroptera, dragon-flies,
ants, &c.—4. *Strepsiptera*, t
5. *Lepidoptera*, the butterfli
Diptera, the house-fly and
insects.—7. *Orthoptera*, cric
locusts, earwigs, &c.—8.
frog-hoppers, aphides, &c.—
&c. There are several ani
the classes MYRIOPODA and
are commonly but erroneous
Of these the centipedes, spi
or mites, are well-known e
useful products, as SILK, WA
NEAL, LAC, CANTHARIDES, &
insects. The class includes n
which are extremely destru
which are regarded as domes
articles devoted to these
various methods of extermi
noticed. A powder for dest
recently been introduced i
and has been found pecu
This powder, which is kno
names (INSECT-DESTROYING
MONT'S INSECTICIDE, &c.), is
Pyrethrum roseum Caucasi
flower growing wild in th

a and ably exposed by the clergy, magistrates, and by philanthro- r grade, that it would be folly to i refer to it here. Fully one half r disreputable deeds of those who , and fully an equal proportion of and wretchedness which pauperizes on and crowds our workhouses, are this damning vice of the Anglo- *intemperance.*

HABITUAL DRUNKENNESS various been proposed, most of which are ous than useful, The following, erves respectful notice:—

an eminent American physician, *tartar emetic*, given in alterative nauseating doses, for the cure of inkenness. "Possessing," he ob- positive taste itself, it communi- asting quality to those fluids in lissolved." "These liquors, with of a very small quantity of emetic ad of relieving, increase the loathing of food, and quickly pro- atient an indomitable repugnance cle of its administration. My rescribing it has varied according s, age, and constitution of the convenient preparation of the grs., dissolved in 4 oz. of boiling oz. (say a table-spoonful) of the e put into half a pint, pint, or patient's favourite liquor, and to y in divided portions. If vomit- ging ensue" (which is seldom the ould direct laudanum to allay the d diminish the dose. In some ange suddenly produced in the bits has brought on considerable debility, which, however, were of on. In a majority of cases no has been perceptible than slight diarrhœa, and a gradual but very aste to the menstruum."

Marcet has chiefly described the s disordered state of the brain, les, and stomach, brought on by l use of alcohol, even without in- ing produced. The symptoms of which he terms CHRONIC ALCO- quite distinct from those of REMENS, which is an acute and urbance of the nervous system. nents on a large number of pa- arcet has arrived at the important hat oxide of zinc is the true anti- of slow alcoholic poisoning. It as a strong tonic on the nerves, same time a powerful sedative nodic.[1]

oms of actual intoxication, or the ndition of the intellectual func- ition, produced by taking excessive quantities of alcoholic liquors, need not be described.

Among the remedies employed to remove the 'fit of drunkenness,' the preparations of ammonia, and the vegetable acids, are the most common and important. About 2 or 3 fl. drs. of aromatic spirits of ammonia (spirits of sal volatile), or a like quantity of solution of acetate of ammonia (mindererus spirit), mixed with a wine-glassful of water, will in general neutralize or greatly lessen the action of intoxicating liquors. In some cases these fluids produced vomiting, which is, however, a good symptom, as nothing tends to restore an inebriated person so soon as the removal of the liquor from the stomach. Hence tickling the fauces with the finger or a feather, until sickness comes on, is a method very commonly adopted by drunkards to restore themselves to a sober state. The use of aromatic water of ammonia was first suggested by Mr. Bromley. With a like intention, some persons have recourse to soda-water, which acts by the free carbonic acid it contains, and also as a diluent and, from its coldness, as a tonic on the coats of the stomach. The carbonates and bicarbonates of soda and potassa are also favourite remedies with habitual drunkards, Among the vegetable acids, acetic acid is the one that appears to possess the greatest power of removing intoxication; and after this follow the citric, tartaric, malic, and carbonic acids. These substances are commonly taken by soldiers before going to parade. The usual dose of vinegar is a small teacupful. In the West Indies lime juice and lemon juice are had recourse to. Both these juices act from the citric acid they contain. The use of bitter almonds, as a means of lessening or retarding the effects of fermented liquors, was known to antiquity, and is still common among heavy drinkers at the present day. Even small doses of medicinal prussic acid have been foolishly taken with a like intention. See ABSTINENCE, DELIRIUM TREMENS, &c.

INTERMIT'TENT FEVER. *Syn.* AGUE. A disease consisting of paroxysms or periods of fever, with perfect intermissions or periods without fever. Marsh miasmata, or the effluvia arising from stagnant water or marshy ground, when acted upon by heat, are the most frequest causes of this malady. For the prevention of ague in situations where it prevails endemically, small doses of quinine should be taken two or three times a day, and flannel clothing should be constantly worn.

Symp. Each febrile paroxysm is of three periods or stages—the cold, the hot, and the sweating stage, and these occur in regular succession. The cold stage commences with great languor and aversion to motion; a sense of coldness down the back soon follows; then the extremities become cold, the fingers shrunken, and the nails blue; the skin assumes that peculiar condition which is commonly known another change comes over the patient, moisture appears on the face and forehead, the harsh and hot skin becomes soft, and at last a copious sweat breaks out over the whole surface. This is the third or sweating stage, and after it has passed, the several functions of the system return to their ordinary condition. The paroxysm may return daily (QUOTIDIAN AGUE); or every other day (TERTIA A.); or every fourth day, including that of the first attack (QUARTAN A.).

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[1] e Alcoholic Intoxication.' By W. Marcet,

Treatm. During the cold stage everything should be done to bring on the hot; the patient should be placed in a warm bed, with warm pans or bottles of water; he may be allowed the free use of warm diluent drinks. In the hot stage the opposite course should be adopted; the coverings must be diminished, and lemonade or other cooling drink administered. In the sweating stage there is no occasion for any treatment beyond care to avoid checking the perspiration by premature exposure. During the intermission the disease must be fought with the tonics, Peruvian bark, or its chief alkaloid, quinine. The most effective form of this remedy is the sulphate, which may be given in doses of from 2 to 4 grs. every three hours, the dose being greater for a quartan than for a quotidian. See AGUE-CAKE, FEVER, &c.

INTOXICA'TION. See INTEMPERANCE.

IN'ULIN. *Syn.* INULINE, ALANTINE, DAHLINE. A peculiar starch-like substance, first obtained by Rose from the root of *Inula Helenium* or *elecampane*. It has been found in several other vegetables.

Prep. From the rasped root, by the same method that is adopted for arrow-root or potato farina; or by boiling the sliced root in 7 or 8

deflagrate like the chlorates
combustibles. They are all of
and many are quite insolubl
may be made by adding iod
drates or carbonates, and
sparingly soluble iodate fr
luble iodide. See IODIC A
POTASSA.

IODHY'DRIC ACID. See

IOD'IC AC'ID. HIO_3. S
CUM, L.

Prep. 1. Iodate of sodiu
sulphuric acid in considerabl
tion boiled for 15 minutes, a
to crystallize.

2. Decompose iodate of
sulphuric acid.

3. (Boursen.) Iodine, 1
(sp. gr. 1·5), 40 parts; mi
nearly the boiling tempera
hours, or until the iodine i
evaporate to dryness, and le
in the open air at a temp
59° Fahr.; when, by attra
has acquired the consistence
into a place where the temp
and the air drier, when in
fine white crystals of a rho
form.

Prep., &c. Iodic acid is a
white or yellowish-white;
into oxygen and iodine by a
to 500° Fahr., a property o
ourselves for the conversio
this acid (iodates) into iod
soluble in water, and is ra
when heated with inflamma
acid is *used* as a test for mor
ous acid. It has been em

All the principal iodides are
the names of their respective
DINE, &c.

Sym. Iodum, B.P.; Iodinium
Iodineum (Ph. E.), L.; Iode,
r. An elementary substance
scovered in 1812, by De Cour-
e manufacturer at Paris. It was
and described by M. Clement,
ts precise nature was soon after-
ined by Sir H. Davy and M.
In 1819, some six years after
iodine was first employed in
he merit of the introduction of
curative agent into medicine is
oindet, a physician of Geneva,
ar commenced a series of ex-
n it as a remedy for bronchocele
is found in each of the three
nature, but exists in greatest
the vegetable family *Algæ*

ne is principally manufactured
ourhood of Glasgow, from the
of kelp, known as iodine lye.
half vitrified ashes of seaweed, is
water, and the solution filtered;
hen concentrated by evaporation
ced to a very small volume, the
um, carbonate of sodium, chloride
and other salts, being removed
ssively assume the crystalline
itriol is now added, in excess, to
rk-brown mother-liquor (iodine-
evolved gases are either kindled
escape by a flue; the liquid,
g some time, is decanted or
d to about 140° Fahr., and
much binoxide of manganese as
of vitriol employed; the whole
luced into a cylindrical leaden
l with a very short head and
h 2 or 3 large globular glass
heat is applied, when fumes of
lved and condensed in the re-
ing the distillation very great
o watch the process, and prevent
he still becoming choked with
ne. For this purpose the head
usually furnished with a movable
ich the process may be watched,
of manganese or sulphuric acid
ired. To render the product
d be pressed between blotting
n resublimed in glass or stone-

on of sulphate of copper, 4
tosulphate of iron, 9 parts, are
nother liquor of the soda works,
hite precipitate is thrown down;
s (iodide of copper) is collected,
ed with its own weight of finely
k oxide of manganese, and dis-
ng heat in a retort, when dry
over. *By the addition of sul-*
the manganese, a less heat is required, but the product is wet with water, like that of the last formula.

3. The residual liquor of the manufacture of soap from kelp (or other iodine lye), of the sp. gr. of 1·374, is heated to 230° Fahr., with sulphuric acid diluted with half its weight of water, after which the liquor is allowed to cool, and is either decanted or filtered; to every 12 fl. oz. of the filtrate 1000 grs. of black oxide of manganese, in powder, are added; the mixture is put into a glass globe or matrass with a wide neck, over which is inverted another glass globe, and heat is applied by means of a charcoal chauffer, when iodine sublimes very copiously, and condenses in the upper vessel; as soon as the latter is warm it is replaced by another, and the two globes are thus applied in succession, as long as violet fumes are evolved. The iodine is washed out of the globes with a little cold water. A thin disc of wood, having a hole in its centre, is placed over the shoulder of the matrass, to prevent the heat from acting on the globular receiver. On the large scale, a leaden still, as before described, may be employed, and receivers of either stoneware or glass; and the addition of the sulphuric acid is made in a basin or trough of stoneware or wood. Prod. 12 oz. yield 80 to 100 grs.

4. Another method of preparing iodine has been patented by a Mr. Stanford, which consists of compressing the wet weed, drying in an oven, and distilling at a high temperature. The inventor claims that double the usual amount of iodine is obtained besides other useful products.

Prop. Iodine is usually met with under the form of semi-crystalline lumps having a semi-metallic lustre, or in micaceous, friable scales, somewhat resembling plumbago or gunpowder. By carefully conducted sublimation, or by the slow evaporation of its solution in hydriodic acid, it may be obtained in rhombic-plates an inch long. It has a grayish-black colour, a hot acrid taste, and a disagreeable odour, not much unlike that of chlorine. It fuses at 225° into a deep-brown liquid, volatilizes slowly at ordinary temperatures, boils at 347°, forming a magnificent violet-coloured vapour; when mixed with water, it rapidly rises with the steam at 212° Fahr. It dissolves in about 7000 parts of water, and freely in alcohol, ether, solutions of the iodides, liquid hydriodic acid, chloroform, petroleum, bisulphide of carbon, &c. Most of these solutions have the brown colour of liquid iodine, but some (particularly those formed by the last three solvents named above) have the beautiful violet colour of the vapour. It bleaches like chlorine, only more feebly. Iodine has an extensive range of affinity; with the metals it forms compounds termed iodides, of which several are used in medicine. Its principal compounds with oxygen are the iodic and periodic anhydrides. Sp. gr. 4·946 to 4·948. *According* to Debaugne, the addition of syrup of orange peel or tannin to water greatly increases its power of dissolving iodine. 2 grs. of the latter will enable 6 fl. oz. of water to take 10 grs. of iodine. A knowledge of these facts may prove useful to the pharmaceutist.

Pur. It is entirely soluble in rectified spirit, and in a solution of iodide of potassium. On applying heat to it, it first liquifies, and then (wholly) sublimes in violet-coloured vapour. The iodine of commerce is usually that of the first sublimation, and generally contains from 12% to 20% of water. Some of the foreign iodine, prepared by precipitation with chlorine, without subsequent sublimation, even contains 1-4th part of water, and has a dead leaden-gray colour, and evolves a sensible odour of chlorine. Coal, plumbago, oxide of manganese, crude antimony, and charcoal, are also frequently mixed with iodine to increase its weight. Water may be detected by the loss of weight it suffers when exposed to strong pressure between bibulous paper; or more accurately by drying it in the manner directed below,—chlorine may be detected by the odour; and the other substances mentioned above, by their insolubility in rectified spirit and in a solution of iodide of potassium. Before use as a medicine, it should be dried by being placed in a shallow basin of earthenware, in a small confined space of air, with 10 or 12 times its weight of fresh burnt-lime, till it scarcely adheres to the side of a dry bottle, or else prepared from the commercial iodine as follows:—Place it in a deep circular porcelain capsule, and having covered it accurately with a glass matrass filled with cold water, apply a water heat to the capsule for 20 minutes, and then allow the whole to cool; should the sublimate attached to the bottom of the matrass include acicular prism of a white colour, and a pungent odour, it must be scraped off with a glass rod, and rejected; the apparatus is then to be again exposed to a gentle and steady heat until the whole of the iodine has sublimed; the sublimate is, lastly, to be collected from the bottom of the matrass, and at once enclosed in a stoppered bottle.

Tests. Free iodine may be recognised by the violet colour of its vapour, by its imparting a violet colour to bisulphide of carbon, and by its striking a blue colour with starch. The latter test is so delicate, that water containing only $\frac{1}{450000}$th part of iodine acquires a perceptible blue tinge on the addition of starch. Free iodine may be eliminated from solutions of iodides by chlorine, nitric acid, concentrated sulphuric acid and peroxide of manganese, and may be made evident by adding starch-paste. This reagent serves to detect minute traces of iodine in insoluble as well as in soluble compounds of that element. The substance under examination is mixed in a retort with concentrated nitric acid, and a strip of white cotton cloth moistened with a solution of starch suspended from the stopper; in a
few hours the cloth will become
if the most minute trace of iodi
By mixing the liquid containi
with the starch and acid, and li
thereon a small quantity of aque
very visible blue zone will be de
line of contact, even in very di

Iodides give a pale yellowi
with nitrate of silver, scarcely
monia, and insoluble in dilute
bright yellow one with acetate
scarlet one with bichloride of
distinguishes them from the iod
white precipitates with the same
solutions of alkaline iodides chl
dium produces a black precipita

Estim. The proportion of fr
mixture may be estimated: by
by heat, and collecting and
sublimate; by solution in re
adding water, and collecting
ing precipitate, which must
and weighed; by dissolving it
of iodide of potassium, and t
standard solution of hyposulphi
until the whole of the free iodin
and the mixture no longer strike
with starch. 24·8 grs. of the
are necessary to absorb 12·7 grs.
by comparing the tint of a solu
by chloroform with that of a
tion containing a known quanity
in Crum's process for estimating

Uses, &c. Iodine is chiefly us
cine, a chemical test, and in pho
small doses it appears to be both
tonic, rapidly diffusing itself thr
and exerting a stimulating action
of secretion. It is also said to b
in some cases to have produced
salivation. Iodine has been ex
following diseases, as well as i
depending on an imperfect actio
bents, or accompanied by indu
largement of individual glands
Internally, in bronchocele, goit
neck, scrofula, ovarian tumour
or induration of the lymphatic,
parotid glands, amenorrhœa, le
eases of the muco-genital tis
chronic nervous diseases, lepra, ps
rheumatism, dropsies, hydrocele,
nally, in scrofula, numerous
(especially the scaly), erysipelas,
chilblains, burns, scalds, vario
check ulceration, to promote a
—*Dose.* ⅛ gr. dissolved in spir
by means of an equal weight
potassium. It is seldom exhibit
usually combined with the la
stance, which, in fact, is now
ferred by practitioners. It is

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[1] For details of this and other meth
determining the per-centage of iodine,
the reader is referred to Sutton's "Sy
of Volumetric Analysis."

form of ointment, solution, or

mides of. Bromine and iodine
by mere mixture. By careful
d vapour is obtained, which, on
ses into red crystals, of a form
ı leaves. This is said to be the
IBr). By adding more bromine,
re converted into a fluid, said to
iide (IBr_5).

rides of. When dry chlorine is
y iodine, at common tempera-
volved, and a yellow solid ter-
results when the iodine is fully
an orange-red liquid protochlo-
ı the iodine is in excess. They
oisture in the air, are volatile,
le in water.

Hydrogen. Hydriodic Acid,
ohdyric Acid; Acidum Hydri-
An acid compound of iodine and
rep. 1. (Gaseous).—*a.* Into a
sed at one end, introduce a little
small quantity of roughly pow-
oistened with water, next a few
its of phosphorus, and upon this
glass; this order (iodine, glass,
glass) is to be repeated until the
nalf or two thirds filled; a cork
tube are then to be fitted in, a
applied, and the gas collected by
lisplacement' or over mercury. If
passed into water a solution of
d will be obtained.

riodic acid gas can only be retained
over mercury, owing to its action
d.

little water over some pentaiodide
us, previously put into a glass
r a gentle heat, and collect the gas

gether in a retort water, iodide of
odine, and phosphorus, and collect
efore.

pure iodide of barium in a retort,
ose it with sulphuric acid.

tion of Hydriodic Acid.) — *a.*
repared by either of the above
sed into cold distilled water.

in fine powder, is suspended in
a stream of washed sulphuretted
ssed through the mixture as long
is deposited, or until it becomes
The liquid is then gently heated,
excess of sulphuretted hydrogen,
ecanted or filtered. A cheap and
ocess.

icinal Hydriodic Acid). Dr.
-Tartaric acid, 264 grs.; pure
otassium, 330 grs.; dissolve each
in 1¼ fl. oz. of water; mix the
d when the precipitate has settled
lear liquid, and add a sufficiency of
ake it up to 6¼ fl. oz. The liquid
ttle acid *tartrate of potassium in*
t this does not interfere with its medicinal properties. This preparation "possesses all the therapeutic powers of iodine without its irritating properties." (Pereira.) —*Dose.* ½ to 1 fl. dr., gradually increased to 2 or 3 fl. dr., twice or thrice daily.

Prop., &c. Gaseous hydriodic acid is colourless, fumes in the air, is very soluble in water, and has a density of about 4·4. Liquid hydriodic acid, when strong, is very liable to decompose, and should be kept in well-stoppered bottles. Both the gas and the solution are decomposed by potassium, zinc, iron, and other metals, with the evolution of hydrogen and the formation of salts called *iodides.*

IOD'OFORM. CHI_3. *Syn.* Iodoformum, L. A solid, yellow, crystallizable substance, obtained by the action of iodine on alcohol.

Prep. An alcoholic solution of potassa is added to tincture of iodine, carefully avoiding excess; the whole is then gently evaporated to dryness, the residuum is washed with water, and then dissolved in alcohol; the alcoholic solution yields crystals by evaporation.

Prop., &c. Nearly insoluble in water; freely soluble in alcohol; the solution is decomposed by caustic potassa into formic acid and iodide of potassa.—*Dose.* ½ gr. to 3 grs.; where the use of iodine is indicated.

IPECACUAN'HA. *Syn.* (Ipecacuhana, L.; Ipecacuan, E., B. P.) Radix ipecacuanhæ, Ipecacuanha (Ph. L. E. & D.), L. The dried root of *Cephaëlis Ipecacuanha,* or the true ipecacuanha plant, one of the *Cinchonaceæ.* "Ashy coloured, tortuous, very much cracked, and marked in rings with deep fissures, having an acrid, aromatic, bitterish taste." (Ph. L.) It occurs in pieces, 3 or 4 inches long, and about the size of a writing quill.—*Dose.* As an *emetic,* 10 to 20 grs., assisted by the copious use of warm water; as a *nauseant,* 1 to 3 grs.; as an *expectorant* and *sudorific,* ½ to 1 gr. It is undoubtedly the safest and most useful medicine of its class. It has recently been highly recommended in dyspepsia, combined with other bitters or aperients.

IRID'IUM. Ir. A rare metal discovered by Descotils in 1803, and by Tennant in 1804, in the black powder left in dissolving crude platinum. This powder is an alloy of iridium with osmium. The metal is also found native and nearly pure amongst the Uralian platinum ores.

Prep. The native alloy of iridium and osmium, remaining after dissolving crude platinum in aqua regia, is reduced to powder, mixed with an equal weight of dry chloride of sodium, and heated to redness in a glass tube, through which a stream of moist chloride gas is transmitted. The further extremity of the tube is connected with a receiver containing liquor of ammonia. Chloride of iridium and chloride of osmium are produced; the former remains in combination with the chloride of sodium; *the latter,* being volatile, is carried forward *into the receiver,* where it is decomposed into osmic and hydrochloric acids, which combine with the ammonia. The contents of the tube, when cold, are treated with water to dissolve out the double chloride of iridium and sodium; the solution thus formed is mixed with an excess of carbonate of sodium, and evaporated to dryness. The residue is ignited in a crucible, boiled with water, and dried; it then consists of a mixture of sesquioxide of iron and a combination of oxide of iridium with sodium hydrate. It is reduced by hydrogen at a high temperature, and treated successively with water and strong hydrochloric acid, which remove the alkali and the iron, leaving metallic iridium in a divided state. By strong pressure and exposure to a welding heat, a certain degree of compactness may be given to the product.

Prop., *&c.* Brittle, white, very hard, only fusible by the strongest heat of Deville's gas furnace. In its pure state it is not acted upon by any of the acids, but it is oxidized by fusion and nitre, and by ignition to redness in the air. An ingot of iridium, weighing $27\frac{3}{4}$ oz., melted by Deville's process, was displayed in Messrs. Johnson and Matthey's case at the International Exhibition of 1862. An alloy of iridium and osmium (artificial or native) has been employed for tipping the nibs of gold pens (everlasting pens).

Iridium, Chlo'rides of. DICHLORIDE. $IrCl_2$. An olive green powder formed by transmitting chlorine over powdered iridium, heated to a dull red, or by digesting the hydrated protoxide in hydrochloric acid. SESQUICHLORIDE, Ir_2Cl_6, obtained by calcining iridium with nitrate of potassium, digesting in nitric acid, washing with water, and solution in hydrochloric acid. TETRACHLORIDE, $IrCl_4$, obtained in solution by adding hydrofluosilicic acid to the tetrachloride of iridium and potassium (formed when chlorine is passed over a heated mixture of iridium and chloride of potassium). HEXACHLORIDE, $IrCl_6$, obtained in combination with potassium, by heating iridium with nitrate of potassium, dissolving in aqua regia, and evaporating to dryness.

Iridium, Ox'ides of. MONOXIDE, IrO, prepared by adding potassium hydrate to the hexachloride of iridium, and digesting the precipitate in an acid. It is a heavy black powder, insoluble in acid. SESQUIOXIDE, Ir_2O_3, is best prepared by fusing in a silver crucible a mixture of carbonate of potassium and the double chloride of iridium and potassium, and boiling the product in water. Bluish-black TRIOXIDE, IrO_3, is produced when carbonate of potassium is gently heated with hexachloride of iridium. A grayish-yellow hydrate, containing alkali.

I'RON. Fe. *Syn.* FERRUM, L.; FER, Fr.; EISEN, Ger. The history of this most important metal extends to the remote past. The discovery of an iron rod in one of the Assyrian bronzes brought to England by Mr. Layard established the interesting fact that this metal was known and commonly employed, where
required, nearly 3000 years ago.
and scales of iron were used as
period equally remote.

Sources. Iron in a metallic sta
is of very rare occurrence; but
enters into the composition
Combined with oxygen and oth
iron ores, it occurs in nearly eve
earth. These ores may be di
oxides and the carbonates. The
again divided into four distinct
(1) Magnetic iron ore, consistin
oxide and 69% sesquioxide, wit
cant proportion of silica; (2) sp
iron glance, composed of the ses
a small admixture of magnetic
hæmatite, consisting of the sesq
in a state of purify; and (4) br
the hydrated sesquioxide of i
bonates are principally two, viz.,
iron, the protocarbonate of iro
condition, and (6) clay ironstone
ironstone, which consists of
bonates associated with clay and
matter.

Swedish iron is made almost
No. 1, which occurs in massive
dahl and Dannemora, in Swede
is of great purity, being perfec
sulphur and phosphorus. The ti
sand found at Taranaki, in New
sists almost entirely of No. 1 a
titanium. No. 2 found princi
island of Elba, in the form of
crystals. The micaceous iron
small quantities in Wales and L
nearly the same composition, but
brilliant plates. No. 3 occurs in r
masses in different parts of the
found in large quantities in Wa
cashire, some of the specimens f
locality containing nearly 99% c
oxide. It makes excellent iron.
in reddish-brown masses of a bo
It is a valuable ore, and is foun
Wales, and Scotland. No 5 is fo
Siegen, in Prussia. No. 6 is the
of the Staffordshire and Scotch
where it occurs in great abunda
with the fuel and the flux requi
ing it. Iron is contained in pla
an essential component of the
higher animals.

Prep., *&c.* Iron is only pr
large scale, and an account of th
would be out of place here. T
detailed information must cons
rate works of Percy, Hunt, Fair
and other metallurgists.

Pure iron may be prepared b
fine iron wire, cut small, 4 pa
oxide of iron, 1 part, into a He
covering with a mixture of whi
and carbonate of potassium (in t
used for glass-making); and,

over, exposing the crucible to
egree of heat. A button of
thus obtained, the traces of
d silicon present in the wire
d by the oxygen of the black

he properties and uses of iron
nown to require description.
s are almost universal. It is
tile, and possesses great tena-
s malleable than many of the
Its sp. gr. is 7·844. It is the
he malleable and ductile metals,
mbined with carbon (steel)
ng tempered to almost any
ess or elasticity. In dry air it
s at common temperatures; but
t soon becomes covered with a
f black oxide, and at an intense
rns brilliantly with the produc-
is substance. Pure water, free
bonic acid, does not tarnish the
ished iron, but the combined
nd moisture, especially when a
ur is present, causes its surface
ered with rust, which is hydrated
iron (ferric hydrate). Nearly all
on; dilute sulphuric and hydro-
lo so with considerable energy
ion of hydrogen gas. At a red
mposes water rapidly, hydrogen
, and the black oxide of iron
. is magnetic up to a dull-red
point it loses all traces of that
melts at about 3300° Fahr.
chlorine, iodine, the acids, &c.,
rous important compounds. As
gent, when properly exhibited,
genial stimulant and tonic, and
res beneficial in cases of chronic
companied with organic conges-
mation. The carbonate (ferrous
it exists in mineral waters, held
carbonic acid in excess, appears
a most congenial to the human
m its state of dilution is rapidly
he lacteals, and speedily imparts
o the wan countenance. Iron is
ne of the most valuable articles
a medica, and appears from the
its introduction into medicine,
iber of its preparations, to have
lly appreciated.
n forms two classes of salts,
us or proto salts, in which iron
ower of combining with two
y monad element, and the ferric
a which iron has a capacity of
three atoms of any monad

s or proto salts have generally a
ur, but yield nearly colourless
ept when concentrated. Their
known by the following re-
y are not precipitated by hydro-
d when acid, and but incompletely when neutral. Sulphide of ammonium produces a black precipitate, becoming brown on exposure to the air, insoluble in alkalies, but easily soluble in the mineral acids. Ammonia and potassa give a greenish-white precipitate, gradually becoming green, and then brown in the air. This precipitate occasionally is of a bluish-black, if excess of potassa is used. The presence of ammoniacal salts interferes with the action of these tests. Ferrocyanide of potassium gives a nearly white precipitate, becoming gradually blue in the air, and immediately so on the addition of a little weak nitric acid or chlorine water. Ferricyanide of potassium produces a rich deep-blue precipitate, insoluble in hydrochloric acid. In highly dilute solutions the effect is only a deep bluish-green coloration. Phosphate of sodium produces a white precipitate, which after a time becomes green.

The ferric salts, which are also called the sequi or persalts of iron, have for the most part a reddish-yellow colour, yielding deep-coloured solutions, which exhibit the following reactions:—They redden litmus paper. Hydrosulphuric acid in acid solutions reduces ferric to ferrous salts, giving a white or yellow precipitate of sulphur only. In alkaline solutions it yields a blackish precipitate, consisting of sulphur and ferrous sulphide. Sulphide of ammonium gives similar reaction. Ammonia and potassa produce bulky reddish-brown precipitates, insoluble in excess. Ferrocyanide of potassium gives a rich blue precipitate, insoluble in hydrochloric acid, and readily decomposed by potassa. Ferricyanide of potassium deepens the colour, but does not give a blue precipitate, as it does with ferrous salts (proto salts). Sulphocyanide of potassium gives an intense ruby-red colour to neutral or acid solutions. Tincture and infusion of galls strike a black colour. Phosphate of sodium gives a white precipitate, which becomes brown, and finally dissolves on the addition of ammonia.

Estim. The iron may be thrown down in the state of ferric hydrate or hydrated sesquioxide, washed, dried, ignited, and weighed. The weight, in grains, multiplied by ·7, indicates the weight of metallic iron.

50 grs. of the ore are reduced to powder, dissolved in aqua regia, with the aid of heat, and the solution filtered in order to separate the silica and a little alumina which sometimes is left in an insoluble state; an excess of ammonia is then added to the filtered liquor, which produces a reddish-brown precipitate of ferric hydrate mixed with alumina, which is collected on a filter, washed, and boiled with a solution of potassa, in order to dissolve the alumina; the whole is next thrown upon a filter, washed, dried, carefully ignited, and weighed. The above is well adapted to determine the quantity of iron in *clay ironstone, the* most common ferruginous ore in *England.*

Iron, Preparations of:—

Ferric Acetate. $Fe_2(C_2H_3O_2)_6$. *Syn.* PERACETATE OF IRON; FERRI SESQUIACETAS, L. *Prep.* Ferric carbonate, 1 part; acetic acid, 6 parts; digest 3 days, and filter. A dark brownish-red, uncrystallisable liquid, very soluble, and powerfully astringent. The calcined sesquioxide of iron of the shops, commonly sold as carbonate of iron, does not answer well for this or any of the sesquicompounds, owing to its being with difficulty dissolved by acids, especially by the weaker ones.—*Dose.* (Of the last) 10 to 25 drops, in water or wine.

Ferric Albuminate. *Syn.* FERRI ALBUMINAS, L. *Prep.*

Precipitate a filtered solution of white of egg with another of ferric sulphate or persulphate of iron, wash the deposit in water, and dissolve it in alcohol holding potassium hydrate in solution.

This preparation is highly spoken of by M. Lassaigne, as especially adapted by its nature, on theoretical grounds, for combining with the tissues of the body.

Ferric Citrate. $Fe_2(C_6H_5O_7)_2$. *Syn.* PERCITRATE OF IRON, CITRATE OF SESQUIOXIDE OF I., CITRATE OF I.; FERRI CITRAS.

Prep. By saturating a solution of citric acid in an equal weight of water with freshly precipitated moist hydrated ferric hydrate, evaporating at 150° Fahr. to the consistence of a syrup, and spreading on glass plates to dry.

By either of the methods adopted for the AMMONIO-CITRATE, merely omitting the addition of the ammonia. It much resembles the ammonio-citrate, but is only slightly soluble in water, and has a rather less agreeable taste.—*Dose.* 3 to 5 grs.

Ferric and Ammonium Citrate. $FeNH_4.C_2H_3O_2$. *Syn.* AMMONIO CITRATE OF IRON; AMMONIO FERRIC CITRATE; FERRI AMMONIO CITRAS.

L. There are several preparations in which the term 'citrate of iron' has been applied. That commonly known under this name is really a double citrate of iron and ammonia, and appears to be correctly called 'ammonio-citrate of iron.'

B.P. Liquor Ferri Persulphatis (B.P.), 8; liquor ammonia, 19½; citric acid (in crystals), 4; distilled water, a sufficiency, mix 14 of the solution of ammonia, with 40 of water, and all gradually; the solution of ferric sulphate stir constantly and briskly; let the mixture stand two hours, and put into a calico filter and allow to drain. Wash well the precipitate until it no longer gives a precipitate with Barium's chloride. Dissolve the citric acid in 8 oz. of the water, and having applied the heat of a water bath add the precipitate of ferric hydrate previously well drained, stir them together until the whole or nearly the whole of the hydrate has dissolved. Let the solution cool, then add 5½ of the ammonia, filter through flannel, evaporate to the consistency of syrup, and dry it i
flat porcelain or glass plates
not exceeding 100°.

Prep. (Ph. L.) Ferrous sulp
bonate of sodium, 12½ oz.; di
rately in boiling distilled wat
the solutions whilst still ho
precipitate to subside; afte
the supernatant liquor, was
frequently with water (drain
acid (in powder), 6 oz., and
aid of a gentle heat; whe
cooled, add of liquor of ammo
oz., and gently evaporate to t
a syrup; in this state spread
flat earthenware dishes (or
dry by a gentle heat, and wn
well-stoppered bottles.

(Ph. D.) Citric acid, 4 oz.
16 fl. oz.; hydrated ferric oxi
the sulphate, 5 oz.; liquor of
or q. s.

(Wholesale.) A mixture of
citric acid, in powder, with
water to cover it, is kept in
for some days, occasionally st
and replacing the water as it
saturated solution is next n
water, there being previous
citric acid (about half the we
first used), as required; it is
with liquor of ammonia (about
of ammonia, sp. gr. ·882, to
the solution of sp. gr. 1·025),
is concentrated by evaporation
then completed as in No. 1.
of this process produces a salt
of iron, or ferrous citate, whi
converted, by exposure to the
a citrate of the magnetic acid
citrate, and, lastly, into citrate
iron, or ferric citrate.

B. P. Liquor Ferri Persulph
Ammoniæ 19½. Citric acid (in
tilled water, a sufficiency. Mi
tion of ammonia, with 40 of
gradually the solution of ferric
constantly, let the mixture sta
filter through calico, and allow
until the washing ceases to pre
chloride, dissolve the citric aci
add the precipitated ferric hyd
a water bath until dissolved.
cool, add 5½ of the ammonia
flannel, evaporate to the consis
and dry on flat porcelain plate
at a temperature below 100° F

Obs. Pharmaceutical writer
diffuse in their disquisitions on
of this salt, as would lead to th
there is some difficulty attendi
trary is, however, the case.
necessary is to spread the syr
thinly on warm sheets of glass
will rapidly do if they are pla
sphere of warm dry air, for

**F is the most convenient. The
then be easily detached from the
l form thin scales, or lamellæ, of
y and beauty. It is also better
more oxide than the acid will
he remainder will be employed
operation. Less water may be
a larger quantity than that men-
n the first case the liquid will
lt to filter—in the latter it will
evaporation. Boiling water dis-
wice its weight of citric acid, and
⁴⁄₁ths of this quantity in solution
nd it takes rather more than
ght of the citric acid in moist
oxide of iron to produce satu-**

**This beautiful salt is of a rich
nd forms glistening transparent
luble in aqueous menstrua, and
solution is less easily decomposed
an the solutions of most of the
iron. It is 'compatible' with
f carbonates and bicarbonates,
her salts, and is nearly tasteless,
ich have been perhaps overrated
riber and patient. It is doubtful
rticle has not obtained a larger
leasing appearance than from its
tues. Several persons who have
lumps or powder, by the simple
f the solution to dryness, have
o sell it under that form, even at**

**itrate of iron is soluble in water;
neither changes the colour of
rmeric; nor is it turned blue by
of potassium; but either potas-
or lime water being added, it
ferric hydrate, and ammonia is
m 100 grs. dissolved in water,
drate precipitates about 34 grs.
ite.—*Dose.* 3 to 10 grs. in water,
r infusions.**

Magnesium Citrate. *Syn.* CITRIC
MAGNESIA; FERRI MAGNESIO-
RRI ET MAGNESIÆ CITRAS, L.
**e last, but using carbonate of
stead of ammonia to neutralize
—*Dose.* 2 to 10 grs. It has been
as a chalybeate in the dyspepsia
debilitated habits.**

Quinine Citrate. *Syn.* CITRATE
AND IRON; FERRI-QUINIO-CI-
the ammonio-citrate, but using
atly precipitated, instead of am-
tralize the acid.

**e ferric hydrate is prepared from
persulphatis, 4½ pints, and liquor
pints, as in the ferric and ammo-
Sulphate of quinine, 1 is mixed
½, and sulphuric acid 1½, and
d, ammonia added until the qui-
pitated. The precipitate is col-
ashed with 30 of water. Citric
*olved in 8 of water by the aid of*** a water bath, and the ferric hydrate, well drained, added; stir together until dissolved, and add the quinine, stirring well until all is dissolved, and allow to cool; add 1½ of solution of ammonia diluted with 2 of water, stirring the solution briskly until the quinine at first thrown down by the ammonia is redissolved; filter and evaporate to a syrup, drying in thin layers on flat porcelain or glass plates at a temperature of 100°.

Ferric citrate, 4 parts; citrate of quinine, 1 part; distilled water, q. s.; dissolve, gently evaporate, and proceed as directed for ammonio-citrate of iron. Greenish golden-yellow scales when prepared by the B.P. process, soluble in 2 parts of water, and somewhat deliquescent; entirely soluble in ether; taste bitter as well as chalybeate.—*Dose.* 2 to 6 drs.; in cases where the use of both iron and quinine is indicated.

Ferric and Sodium Citrate. *Syn.* FERRI SODIO-CITRAS, FERRI ET SODÆ CITRAT, L. *Prep.* From citric acid, carbonate of sodium, and iron or the hydrate, as the ammonio-citrate or potassio-citrate.

Ferric Chlo'ride. Fe_2Cl_6 or $FeCl_3$. *Syn.* SESQUICHLORIDE OF IRON, PERCHLORIDE OF IRON, PERMURIATE OF I.; FERRI SESQUICHLORIDUM, L. *Prep.* 1. (Anhydrous.) By passing dry chlorine over heated iron filings. Brown scales.

(Hydrated.) Dissolve ferric hydrate in hydrochloric acid, evaporate to the consistence of a syrup, and crystallize. Yellow or red scaly crystals. The impure solution of this salt has been greatly used as a sewage deodorizer. See TINCTURE.

Ferric and Ammonium Chloride ($Fe_2Cl_6 . NH_4Cl . Aq$). *Syn.* DOUBLE CHLORIDES OF IRON AND AMMONIUM, AMMONIO CHLORIDE OF IRON; FERRI AMMONIUM CHLORIDUM.

Sesquioxide of iron, 3 oz.; hydrochloric acid, ½ pint; digest in a sand bath, until dissolved, then add of ammonium 2½ lbs., dissolved in water, 3 pints; filter the liquid, evaporate to dryness, and reduce the mass to coarse powder. Orange-coloured crystalline grains readily soluble in water.

Ammonio-chloride of iron is tonic, emmenagogue, and aperient.—*Dose.* 5 to15 grs.; in glandular swellings, obstructons, &c.

Ferric Ferrocy'anide. ($Fe_4(FeCy_6)_3 . 18Aq$). *Syn.* SESQUIFERROCYANIDE OF IRON, PRUSSIAN BLUE; FERRI FERROCYANIDUM, F. SESQUIFERROCYANIDUM, L. *Prep.* Ferrous sulphate, 4 oz.; water, 1 pint; dissolve, add to the solution of nitric acid, 6 fl. drs., in small portions at a time, boiling for a few moments after each addition; next dissolve ferrocyanide of potassium, 4½ oz., in water, 1 pint, and add this last solution, by degrees, to the first liquid, stirring well each time; lastly, collect the precipitate, wash it with boiling water, drain, and dry it.—*Dose.* 3 to 5 grs., three or four times daily, as an alterative, febrifuge, pound, soluble in water and alcohol. It is rarely employed as medicine.

Ferric Oxide. Fe_2O_3. *Syn.* SESQUIOXIDE OF IRON, PEROXIDE OF IRON, RED OXIDE OF I.; FERRI SESQUIOXYDUM, F. PEROXYDUM, F. OXYDUM RUBRUM, L. This substance is found native under several forms, but that employed in the arts is prepared by one or other of the following methods:—

From metallic iron. From iron wire or clean iron filings cut into pieces, moistened with water, and exposed to the air until completely converted into rust; it is then ground with water, elutriated, and dried, in a similar way to that adopted for chalk. For sale, it is usually made up into small conical loaves or lumps.

By Calcination;—(BROWN-RED COLCOTHAR, CROCUS, INDIAN RED, ROUGE, JEWELLER'S R.; FERRI OXYDUM RUBRUM, L.)—Calcine ferrous sulphate until the water of crystallisation is expelled, then roast it with a strong fire until acid vapours cease to rise; cool, wash the residuum with water until the latter ceases to affect litmus, and dry it.

Ferrous sulphate, 100 parts; common salt, 42 parts; calcine, wash well with water, dry, and levigate the residuum. This process yields a cheap and beautiful product, which is frequently sold for the ferri sesquioxydum; but it is less soluble, and therefore unfitted for a substitute for that preparation.

By Precipitation;—FERRI SESQUIOXYDUM—B. P., FERRI OXYDUM RUBRUM—Ph. E. L. By precipitating a solution of ferric sulphate or chloride with ammonia, in excess, and washing, drying, and igniting the resulting hydrate. Pure; anhydrous.

Ferrous sulphate, 4 lbs.; sodium car-

prepared. When expos
brightened, its sp. gr. in
dered less easily soluble
prepared by calcination i
coloured, less soluble, and
has either a scarlet or pu
to the heat to which it h
finest Indian red, or cro
a second calcination, in
a very intense heat. I
'purple brown.' The be
prepared by calcining t
until it becomes scarlet.

The hydrate is of a ye
and though it can be drie
tion, it requires to be
It is best preserved in a
filled with recently distil

Pur. Medicinal ferric
of iron (FERRI SESQUIOX
soluble in dilute hydro
effervescing, and is ag
potassa. The strained
colour, and is not discolo
of either sulphuretted
cyanide of potassium."

The hydrate (FERRI FE
—Ph. D., FERRUGO—Ph
very easily soluble in hy
out effervescence; if pr
Fahr., a stronger heat d
water.

Uses, &c. The prec
ployed in medicine as a
gogue, in *doses* of 10 to
thelmintic and in tic do
1 to 4 drs., mixed up w
employed to make some
The calcined oxide is em

e as an antidote to arsenic is
ired by age, even when kept in
The presence of potassium, so-
um, hydrates, sulphates, chlo-
nates, is not of consequence,
in cases of emergency, time
st in washing the precipitate,
h cases, need only be drained
a a calico filter. The magma ob-
pitating ferrous sulphate with
xcess, and which contains free
magnesium sulphate, besides
, precipitates arsenious acid not
ckly, but in larger quantity, than
does when alone. It will even
Fowler's solution, and precipitate
er and arsenic from solutions of
green in vinegar, which the pure
ide alone will not do.

ate. $Fe_2(NO_3)_6$. *Syn.* PROTO NI-
N, NITRATE OF SESQUIOXIDE OF
I PERNITRAS, L. By digesting
iluted with about half its weight
iron or ferric hydrate. A deep-
pt to deposit a basic salt. It is
g, and has been recommended in
alculous affections, and chronic
Dose. 5 to 10 or 12 drops.

sphate. $Fe_2H_3(PO_4)_3$. *Syn.* FER-
PHOSPHATE (Odling); FERRI SES-
S, PHOSPHAS FERRICUS, L. A
r obtained by precipitating ferric
sodium phosphate. Uses and dose,

PYROPHOSPHATE. A salt contain-
xide of iron combined with pyro-
acid.
precipitating a solution of ferric
th one of pyrophosphate of sodium,
to operate at a temperature below

A gelatinous precipitate, which
ith facility in excess of pyrophos-
lium. The citrate of ammonium is
gible solvent according to M. Robi-
irst called attention to this salt as
gent.—*Dose*. 5 to 10 grs.

lphate. $Fe_23(SO_4)$. *Syn.* PERSUL-
IRON, SULPHATE OF SESQUIOXIDE
ERRI PERSULPHAS, L. *Prep.* By
a solution of ferrous sulphate ex-
s much sulphuric acid as it already
ising the liquid to the boiling.
then dropping in nitric acid, until
ceases to blacken by such addition-
n evaporated to dryness, furnishes
red mass, slowly soluble in water.
With the sulphates of ammonium
um, it unites to form compounds to
name 'iron alums' has been given.
he active ingredient in the 'liquor
s ferri' of Mr. Tyson, and is said
me to be a constituent of 'Widow
s.' This salt is also formed when
hate is calcined with free exposure
Dissolved in water, it is used as a test for hydrocyanic, gallic, and tannic acids.

Ferric Sulphide. Fe_2S_3. *Syn.* PERSULPHURIDE OF IRON. This compound is prepared in the hydrated state (FERRI PERSULPHURETUM HYDRATUM) by adding, very gradually, a neutral solution of ferric sulphate to a dilute solution of potassium sulphide, and collecting, &c., the precipitate, as in the case of the hydrated ferrous sulphide. Proposed by Bouchardat and Sandras as a substitute for ferrous sulphide, to which, they say, it is preferable.

Ferric Tan'nate. *Syn.* FERRI TANNAS, FERRUM TANNICUM, L. *Prep.* From tannin, 1 part; boiling water, 150 parts; dissolve, add of freshly precipitated ferric hydrate (dried at 212° Fahr.), 9 parts; evaporate by a gentle heat to one half, filter, add of sugar, 1 part, complete the evaporation, and at once put it into bottles.—*Dose*. 3 to 5 grs., thrice daily; in chlorosis, internal hæmorrhages, &c.

Double Ferric and Ammonium Tartrate. *Syn.* AMMONIO TARTRATE OF IRON, DOUBLE TARTRATE OF IRON AND AMMONIUM; AMMONIO FERRIC TARTRATE, FERRI AMMONIO TARTRATE; FERRI AMMONIO TARTRAS.

Prep. (Aikin.) Tartaric acid, 1 part; iron filings, 3 parts; digest in a sufficient quantity of hot water to barely cover the mixture for 2 or 3 days, observing to stir it frequently, and to add just enough water to allow the evolved gas to escape freely; next add ammonia, in slight excess, stir well, dilute with water, decant, wash the undissolved portion of iron, filter the mixed liquors, and evaporate to dryness; dissolve the residuum in water, add a little more ammonia, filter, and again gently evaporate to dryness, or to the consistence of a thick syrup, when it may be spread upon hot plates of glass, or on earthenware dishes, and dried in a stove-room, as directed for the corresponding citrate.

Tartaric acid, 6½ oz.; water, 7 pints; dissolve, neutralize the solution with sesquicarbonate of ammonium, and add 6¼ oz. more tartaric acid; to the solution heated in a water bath, further add moist hydrated oxide of iron (obtained from sesquioxide of iron, 53¼ drs., dissolved in hydrochloric acid, and precipitated by ammonia); when dissolved, filter, and evaporate, &c., as before.

Prop., &c., Glossy, brittle lamellæ, or irregular pieces, of a deep garnet colour, almost black, very soluble in water, and possessing a sweetish and slightly ferruginous taste. By repeated re-solution and evaporation its sweetness is increased, probably from the conversion of a part of its acid into sugar. It contains more iron than a given weight of the sulphate of the same base. It is the most pleasant-tasted of all the preparations of iron, except the ammonio-citrate, last noticed.—*Dose*. 3 to 10 grs.

Ferric and Potassium Tartrate. Syn. TAR-

TRATE OF POTASSA AND IRON, FERRO-TARTRATE OF POTASSA, FERRIC TARTRATE OF P.; FERRI TARTARATUM (B. P.), FERRI POTASSIO-TARTRAS (Ph. L.), FERRUM TARTARIZATUM (Ph. E.), FERRI TARTARUM (Ph. D.), FERRI ET POTASSÆ TARTRAS (Ph. U. S.), L. *Prep.* (B. P.) Prepare ferric hydrate from 4 fl. oz. of liq. ferri persulphas, B. P., as in making the double citrate, and add it to 2 oz. of the acid tartrate of potassium, dissolved in 30 oz. of water. Digest for 6 hours at 140°, allow to cool, and decant off the clear solution, which is to be evaporated down and dried on glass plates.—(Ph. L.) Ferrous sulphate, 4 oz., is dissolved in water, 1 pint, previously mixed with sulphuric acid, ½ fl. oz.; heat is applied to the solution, and nitric acid, 1 fl. oz., gradually added; the solution is boiled to the consistence of a syrup, and then diluted with water, 4 galls. (less the pint already used); liquor of ammonia, 10 fl. oz., is next added, and the precipitate washed, and set aside for 24 hours; at the end of this time, the water being decanted, the still moist precipitate is added, gradually, to a mixture of bitartrate of potassium, 2 oz., and water, ½ pint, heated to 140° Fahr.; after a time the undissolved oxide is separated by a linen cloth, and the clear solution either gently evaporated to dryness or treated in the same manner as the citrate (lastly, preserve it in well-stopped bottles). The formulæ of the Ph. E., D., & U. S., are essentially the same. The Ph. D. orders a heat not beyond 150° Fahr. to be applied to the mixture of the oxide and bitartrate, with occasional stirring for 6 hours, and the desiccation to be conducted at the same temperature.

Obs. This preparation is a double salt of potassium and iron; it is therefore wrongly called 'tartrate of iron' as is commonly heard. It is totally soluble in water; the solution is neutral to litmus and turmeric, unaffected by ferrocyanide of potassium, and not precipitated by acids nor alkalies, nor acted on by the magnet. Heated with potassa, 100 gr. throws down about 34 gr. of sesquioxide of iron. Entirely soluble in *cold* water; taste, freely chalybeate. That of commerce has generally a feebly inky taste, a *slight* alkaline reaction, is slightly deliquescent, dissolves in 4 parts of water, and is nearly insoluble in alcohol.

Potassio-tartrate of iron is an excellent ferruginous tonic.—*Dose.* 10 to 20 grs., made into a bolus with aromatics, or dissolved in water or other convenient menstruum.

Ferric Valerianate. *Syn.* VALERIANATE OF SESQUIOXIDE OF IRON, VALERIATE OF IRON; FERRI VALERIANAS (Ph. D.), L. *Prep.* (Ph. D.) By adding a solution of sodium valerianate to another of ferric sulphate, and collecting and washing the precipitate, which is to be dried by placing it for some days folded in bibulous paper, on a porous brick; after which it is to be carefully kept from the air.

Prop., &c. A reddish-brown amorphous powder; nearly insoluble in wat in rectified spirit, and in the dil decomposition. Citrate or tartrat with oil of valerian, is frequently —*Dose*. 1 to 3 grs.; in anæmia complicated with hysteria.

Ferroso-Ferric Hydrate. Fe(H HYDRATED FERROSO-FERRIC DRATED MAGNETIC OXIDE. (B. P.) ferri persulphas, 5½; ferri sulphas, tion of soda, 80; distilled water, ciency. Dissolve the ferrous 40 of water, add the solution of ring them well, boil the mixture, for two hours, put in a calico with distilled water until the no precipitate with barium chl dry at a temperature not exceeding

Ferrous sulphate, 6 oz.; sulphuric minims; nitric acid, 4 fl. drs.; liquor of ammonia, 4½ fl. oz.; boi 3 pints; dissolve half of the half of the water, add the oil of vit add the nitric acid gradually, boil each addition for a few minutes; remaining half of the sulphate in the the boiling water; mix the two soluti the ammonia, stirring well (and boil short time); collect the precipitate on a filter, wash it with water until it precipitate a solution of nitrate of and dry at a heat not exceeding 180° The formulæ of Gregory and Dr. Jeph similar.

Ferrous sulphate, 8 oz., dissolved in ture of water, 10 fl. oz., and sulphuric fl. drs., is converted by means of nitric fl. drs., diluted with water, 2 fl. oz., with sulphates; this solution is then added another, formed by dissolving ferrous sulph 4 oz., in water, ½ pint; the whole is then with liquor of potassium hydrate, 2¾ pints, after being boiled for 5 minutes, is coll on a calico filter, and washed, &c., as bef and is to be preserved in a well-stopp bottle.

Prop., &c. The hydrate is a black like substance, consisting of very min crystals. When pure, it is attracted by magnet, and is entirely soluble in hydrochl acid; and ammonia added to the soluti throws down a black precipitate. The oxi is the chief product of the oxidation of iron a high temperature in the air and in aqueous vapour. It is more permanent than ferrous oxide, but incapable of forming salts.—*Dose*. 5 to 20 grs. two or three times a day.

Ferroso-ferric Oxide. Fe_3O_4. *Syn.* MAG NETIC O. OF I.; FERRI OXYDUM NIGRUM, F MAGNETICUM (Ph. D.), OXYDUM FERROSO-FERRICUM, L. This occurs native, but that used in medicine is prepared artificially.

From the black scales of iron that fall around the smith's anvil, by washing, drying, detaching them from impurities by means of a magnet, and then treating them by grinding

directed for prepared
t of this process is in-
to the hydrate obtained as
ily soluble in the juices of

F$(C_2H_3O_2)_2$. *Syn.* FERRI
1. From freshly precipi-
mate dissolved in dilute

lution of calcium acetate to
sulphate, and evaporating
ut of contact with the air.
r pale-greenish needles or
and prone to oxidation.
$Fe_3(AsO_4)_2$ *Syn.* FERRI
From a solution of sodium
a solution of ferrous sul-
e being collected, washed in
and dried.—*Dose*, $\frac{1}{20}$ to $\frac{1}{12}$
l; in lupus, psoriasis, can-
tc. Externally, combined
ight of ferrous phosphate
as a paint to destroy the
s formations. An ointment
he oz.) is also used for the
y are all dangerous reme-
onal hands.
$Fe(AsO_2)_2$. *Syn.* FERRI
m the potassium arsenite,
te, as the last. A yellowish-
asionally used in medicine
tive, and febrifuge.—*Dose.*

le. $FeBr_2$. *Syn.* FERRI
Prep. (Moir.) Bromine and
ch, 1 part; water, 3 parts;
l phial, set it aside, occasion-
r 2 or 3 days, and when the
ine has disappeared, and the
eenish, filter and evaporate
1 to 6 grs., as a tonic, diu-
it, in similar cases to those
iron is given.
ate. $Fe(CO_3)$. *Syn.* PRO-
IRON; FERRI CARBONAS, F.
This occurs in nature as
s the chief constituent of
and in many CHALYBEATE

errous sulphate (sulphate of
ium carbonate, 1¼; boiling
20; refined sugar, 1. Dis-
e and ammonium carbonate
e water, and mix; allow
hours and decant, of the
dd the remainder of the
cipitate, stir well, allow to
it off. Collect the deposit
ress, rub in the sugar in a
and dry at a temperature
Fahr. Small coherent gray
to a solution of ferrous sul-
lution of sodium carbonate,
a powder with water which
d dry it out of contact with
lightest *exposure to air it is*

converted into ferrous hydrate or oxide. This change is for the most part prevented by combining it with sugar, as in the following preparation.

(With sugar: FERRI CARBONAS SACCARATA, B. P.; SACCHARINE C. OF I.; FERRUM CARBONICUM SACCHARATUM, FERRI CARBONAS CUM SACCHARO—Ph. L., FERRI CARBONAS SACCHARATUM—Ph. E. & D. L.)—(Ph. L.) Ferrous sulphate, 4 oz.; sodium carbonate, 4½ oz.; dissolve each separately in quart of boiling water, and mix the solutions whilst hot; after a time collect the precipitate, wash it frequently with water, and add of sugar, 2 oz., previously dissolved in water, 2 fl. oz.; lastly, evaporate the mixture over a water bath to dryness, and keep it in a well-closed bottle.

Prop. &c. A sweet-tasted greenish mass or powder, consisting chiefly of carbonate of iron. It is one of the best of the chalybeates.—*Dose.* 5 to 10 grs. When pure, it should be easily soluble in hydrochloric acid with brisk effervescence.

Ferrous Chloride. $FeCl_2$. *Syn.* PROTOCHLORIDE OF IRON; MURIATE OF IRON; FERRI CHLORIDUM, L. *Prep.* 1. (Anhydrous.) By passing dry hydrochloric acid gas over ignited metallic iron. The chloride sublimes in yellowish crystals.

2. (Hydrated.) Dissolve iron filings or scale in hydrochloric acid, evaporate and crystallize. Soluble, green crystals.

Ferrous Citrate. $Fe_3 (C_6H_5O_7)_2$. *Syn.* PROTOCITRATE IRON, CITRATE OF PROTOXIDE OF IRON. This salt is easily formed by digesting iron filings or wire with citric acid, and evaporating the solution as quickly as possible out of contact with the air. It presents the appearance of a white powder, nearly insoluble in water, and rapidly passing to a higher state of oxidation by exposure to the air. Its taste is very metallic. It is exhibited under the form of pills, mixed with gum or syrup, to prevent it from being prematurely decomposed.

Ferroso-Ferri C. Hydrate. $Fe_3 (FlO)_8$. *Syn.* HYDRATED MAGNETIC OXIDE. See *under* FERROSO FERRIC OXIDE.

Ferrous Ferricy'anide. *Syn.* FERRIDCYANIDE OF IRON. *Prep.* By adding a solution of potassium ferricyanide ('red prussiate of potash') to a solution of ferrous sulphate (or any other soluble ferrous salt), and collecting and drying and precipitate. A bright-blue powder. (See TURNBULL'S BLUE.)

Ferrous Hydrate. $Fe_2 (HO)_2$. See *under* FERROUS OXIDE.

Ferrous Iodide. FeI_2. *Syn.* PROTOIODIDE OF IRON, IODIDE OF IRON; F. IODIDUM, FERRI HYDRIODAS, F. IODURETUM, L. *Prep.* (B. P.) Fine iron wire, 1; iodine, 2; distilled water, 10. Introduce the iron, iodine and 8 of water into a flask, heat it about ten minutes, and boil until all the red colour is gone. Filter through paper into a polished *iron dish*, washing with the rest of the water, and boil until a drop of the solution taken out on iron wire solidifies on cooling. Pour on porcelain and cool. (Ph. L. 1836.) Iodine, 6 oz.; iron filings, 2 oz.; water, 4½ pints; mix, boil in a sand bath until the liquid turns to a pale green, filter, wash the residuum with a little water, evaporate the mixed liquors in an iron vessel at 212° Fahr. to dryness, and immediately put the iodide into well-stoppered bottles.

Iodine, 1 oz., and clean iron filings or turnings, ⅓ oz., are put into a Florence flask with distilled water, 4 fl. oz., and having applied a gentle heat for 10 minutes, the liquid is boiled until it loses its red colour; it is then at once filtered into a second flask, the filter washed with water, 1 fl. oz., and the mixed liquid is boiled down, until it solidifies on cooling.

With sugar; SACCHARINE IODIDE OF IRON, SACCHARUM FERRI IODIDI, FERRI IODIDUM SACCHARATUM, L. Iron (in powder), 1 dr.; water, 5 drs.; iodine, 4 drs.; obtain a solution of iodide of iron, as above, and add to it of sugar of milk (in powder), 1½ oz.; evaporate at a temperature not exceeding 122° Fahr., until the mass has a tenacious consistence, then further add of sugar of milk, 1 oz., reduce the mixture to powder, and preserve it in a well-stoppered bottle. Every 6 grs. contain 1 gr. of iodide of iron.

From "syrup of iodide of iron" exposed in a shallow vessel, in a warm place, until it crystallizes; the crystals are collected, dried, and powdered. A simpler plan is to gently evaporate the whole to dryness, and to powder the residuum. The saccharine iodide may be kept for some time in a corked bottle without undergoing decomposition.

Obs. The preparation of the above compound, like that of the citrates, has formed a fertile subject during some years for pharmaceutical amateurs to dilate upon. There is in reality not the least difficulty in the process. As soon as iodine and iron are mixed together under water, much heat is evolved, and if too much water be not used the combination is soon complete, and the liquor merely requires to be evaporated to dryness, out of contact with the air, at a heat not exceeding 212° Fahr. This is most cheaply and easily performed by employing a glass flask, with a thin broad bottom and a narrow mouth, by which means the evolved steam excludes air from the vessel. The whole of the uncombined water may be known to be evaporated when vapour ceases to condense on a piece of cold glass held over the mouth of the flask. A piece of moistened starch paper occasionally applied in the same way will indicate whether free iodine is evolved; should such be the case, the heat should be immediately lessened. When the evaporation is completed, the mouth of the flask should be stopped up by laying a piece of sheet india rubber on it, and over that a flat weight; the flask must be then removed, and when cold broken to pieces, the iodide weighed,
and put into dry and warm sto
mouth glass phials, which must be
closed, tied over with bladder, and
dipped into melted wax.

Prop., *&c.* Ferrous iodide
vapours by heat, and ferric
When freshly made, it is totally
water, and from this solution, wh
badly stoppered vessel, ferric hyd
soon precipitated; but with iron wi
in it, it may be kept clear in a w
bottle.—*Dose.* 1 to 3 grs., or more,
stimulant, and resolvent. It has
with advantage in anæmia, chlorosis
scrofula, and various glandular affe

Ferrous Lactate. Fe $(C_3H_5O_3)_2$.
TOLACTATE OF IRON; FERRI LACTA
LACTICUM, L. *Prep.* Boil iron filin
acid diluted with water, until gas
evolved, and filter whilst hot into
vessel, which must be at once closely
as the solution cools, crystals will be
which after being washed, first wi
cold water, and then with alcohol,
carefully dried. The mother liquor,
digested, as before, with fresh iron,
more crystals.

Into sour whey, 2 lbs., sprinkle
milk and iron filings, of each, in fine
oz.; digest at about 100° Fahr., until
of milk is dissolved, then add a second
and as soon as a white crystalline pow
to form, boil the whole gently, and filt
clean vessel: lastly, collect, wash, and
crystals, as before.

Prop., *&c.* Ferrous lactate is a
white salt; and when pure, forms small
or prismatic crystals, which have a
ferruginous taste, and are soluble in
parts of cold and in 12 parts of boiling
It has been regarded by many high auth
as superior to every other preparation
for internal use, as being at once miscible
the lactic acid of the gastric juice, inst
having to be converted into a lact
the expense of that fluid, as it is asserted
case with the other preparations of
Dose. 2 to 6 grs., frequently, in any form
convenient.

Ferrous Ma'late (Impure). Syn.
MALAS IMPURUS, L. *Prep.* (P. Cod.
Porphyrised iron filings, 1 part; juice of
apples, 8 parts; digest for 3 days in an
vessel, evaporate to one half, strain
linen whilst hot, further evaporate to the
sistence of an extract, and preserve it from
air.—*Dose.* 5 to 20 grs., where the
iron is indicated.

Ferrous Nitrate. $(FeNO_3)_2$. Syn.
NITRATE OF IRON, NITRATE OF PROTOXIDE
IRON; FERRI NITRAS, L. By dissolving
rous sulphide in dilute sulphuric acid, in
cold, and evaporating the solution in
Small green crystals, very soluble, and
to oxidation.

Ferrous Oxide. FeO. Syn. PROTOXIDE

OXYDUM, L. This substance
n in a separate state, from its
s to absorb oxygen and pass
ide.

te. $Fe(HO)_2$. May be pre-
errous solutions as a white
line hydrates. It rapidly
and turns first green, and
osure to the air. Both the
te are very powerful bases,
acids and forming stable
en soluble, have commonly a
ur, and a nauseous metallic

phate. *Syn.* Phosphate of
P. of protoxide of iron,
Ferrous orthophosphate
i phosphas (Ph. U. S.), L.
rom ordinary or tribasic phos-

) Ferrous sulphate, 3; so-
, 2½; sodium acetate, 1; boil-
ter, 80; dissolve the sulphate
s, each in half the water, mix,
, filter through calico, wash with
ter until it ceases to give a pre-
rium chloride, dry at a heat not
Fahr. (Ph. U. S.) Ferrous
.; sodium phosphate, 6 oz.;
parate in 2 quarts of water, mix
nd after repose for a short time,
the precipitate.

A slate-coloured powder; inso-
; soluble in dilute nitric and
cid.—Dose. 5 to 10 grs.; in
iabetes, dyspepsia, scrofula, &c.;
, as an application to cancerous

phate. $FeSO_4 . 7Aq$. *Syn.* Pro-
of iron, Sulphate of iron, Cop-
vitriol, Shoemaker's black;
as (P. B., Ph. L. E. & D.). Vit-
. The crude sulphate of iron or
of commerce (ferri sulphas
L.) is prepared by exposing heaps
iron pyrites or native bisulphuret
e air for several months, either in
d state or after it has been roasted.
position is sufficiently advanced,
formed salt is dissolved out with
he solution crystallised by evapora-
this state it is very impure. The
ate or sulphate of iron employed
is prepared as follows:—

.P.) Iron wire, 4; sulphuric acid,
water, 30. Pour the water on the
he acid, and when the disengage-
has nearly ceased, boil for ten
Filter through paper. Allow to
ty-four hours, and collect the
sulphuric acid, 1 fl. oz.; water, 4
, and add of commercial sulphate of
; iron wire, 1 oz.; digest with heat
al agitation until the sulphate is
in whilst hot, and set aside the
crystals may form; evaporate the mother-liquor for more crystals, and dry the whole.

Dissolve the transparent green crystals of the impure sulphate of iron in their own weight of water, acidulated with sulphuric acid, and re-crystallise.

The formula of the Ph. U. S. is similar.

(Dried; Ferri sulphas exsiccata, B. P.; Ferri sulphas exsiccatum—Ph. E., F. s. siccatum—Ph. D.) From ferrous sulphate, heated in a shallow porcelain or earthen vessel, not glazed with lead, till it becomes a greenish-gray mass, and then reduced to powder. The heat should be that of an oven, or not exceeding 400° Fahr. 5 parts of the crystallised sulphate lose very nearly 2 parts by drying.

(Granulated; Ferri sulphas granulata, L.) (B. P.) A solution of iron wire, 4 oz., in sulphuric acid, 4 fl. oz., diluted with water, 1½ pint, after being boiled for a few minutes, is filtered into a vessel containing rectified spirit, 8 fl. oz., and the whole stirred until cold, when the granular crystals are collected on a filter, washed with rectified spirit, 2 fl. oz., and dried, first, by pressure between bibulous paper, and next beneath a bell-glass over sulphuric acid, after which they are put into a stoppered bottle, to preserve them from the air.

Prop., &c. Ferrous sulphate forms pale bluish-green rhombic prisms, having an acid, styptic taste, and acid reaction; it dissolves in two parts of cold and less than one part of boiling water; at a dull-red heat it suffers decomposition; sp. gr. 1·82. It is perfectly soluble in water; a piece of iron put into the solution should not be covered with metallic copper. By exposure to the air it effloresces slightly, and is partly converted into a basic ferric sulphate.—*Dose.* ½ to 4 grs., in pills or solution; externally, as an astringent or styptic. In the arts, as sulphate of iron (copperas), it is extensively used in dyeing, and for various other purposes. The dried sulphate (ferri sulphas exsiccatum) is chiefly used to make pills.

Crude sulphate of iron is frequently contaminated with the sulphates of copper, zinc, manganese, aluminium, magnesium, and calcium, which, with the exception of the first, are removed with difficulty. It also contains variable proportions of the neutral and basic ferric sulphates. The preparation obtained by direct solution of iron in dilute sulphuric acid should, therefore, be alone used in medicine.

In commerce, there are four varieties of crude sulphate of iron or copperas known,—greenish-blue, obtained from acid liquors,—pale green, from neutral liquors,—emerald green, from liquors containing ferric sulphate,—and ochry brown, which arises from age and exposure of the other varieties to the air. Even the first two of these contain traces of ferric sulphate, and hence give a bluish precipitate with ferrocyanide of potassium; whereas the pure sulphate gives one which is at first nearly white.

Ferrous Sulphide. FeS. *Syn.* SULPHURET OF IRON, SULPHIDE OF I., PROTOSULPHIDE OF I.; FERRI SULPHURETUM (Ph. E. & D.), L. *Prep.* (Ph. E. & D.) Expose a bar of iron to a full white heat, and instantly apply a solid mass of sulphur to it, observing to let the melted product fall into water; afterwards separate the sulphide from the sulphur, dry, and preserve it in a closed vessel.

From sublimed sulphur, 4 parts; iron filings, 7 parts; mixed together and heated in a common fire, till the mixture begins to glow, and then removing the crucible from the heat, and covering it up, until the reaction is at an end, and the whole has become cold.

Hydrated; FERRI PROTOSULPHURETUM HYDRATUM, L. By adding a solution of ammonium sulphide or of potassium sulphide to a neutral solution of ferrous sulphate made with recently distilled or boiled water; the precipitate is collected on a filter, washed as quickly as possible with recently boiled water, squeezed in a linen cloth, and preserved in the pasty state, under water, as directed under ferric hydrate.

Prop., &c. The sulphide prepared in the dry way is a blackish brittle substance, attracted by the magnet. It is largely used in the laboratory as a source of sulphuretted hydrogen. The hydrated sulphide is a black, insoluble substance, rapidly decomposed by exposure to the air. Proposed by Mialhe as an antidote to the salts of arsenic, antimony, bismuth, lead, mercury, silver, and tin, and to arsenious acid; more especially to white arsenic and corrosive sublimate. A gargle containing a little hydrated sulphide of iron, will instantly remove the metallic taste caused by putting a little corrosive sublimate into the mouth. (Mialhe.) On contact with the latter substance, it is instantly converted into ferrous chloride and mercurous sulphide, two comparatively inert substances. It is administered in the same way as ferrous hydrate. When taken immediately after the ingestion of corrosive sublimate, it instantly renders it innocuous; but when the administration is delayed until 15 or 20 minutes after the poison has been swallowed, it is almost useless.

Ferrous Tar'trate. *Syn.* FERRI TARTRAS, FERRI PROTOTARTRAS, L. *Prep.* 1. From iron filings, 2 parts; tartaric acid, 1 part; hot water, q. s.; digest together until reaction ceases, agitate the liquid, pour off the turbid solution, and collect, wash, and dry the powder, as quickly as possible, and keep it out of contact with the air.

Crystallised potassium tartrate, 132 parts; ferrous sulphate, 139 parts; dissolve each separately, mix the solutions, and collect the precipitate as before. A nearly insoluble powder; seldom used.

Obs. By dissolving the corresponding hydrates in a solution of tart
the former in slight exce
both the ferrous and ferric
obtained.

IRON AL'UM. See ALU

IRON CEMENT'. See C

IRON FI''LINGS. *Sy*
(Ph. L. 1836), FERRI LI
FERRI SCOBS (Ph. D.). T
preparing iron filings for m
been already noticed; the
to obtain them pure, is t
soft iron with a clean f
orders them to be forcibly
mortar, and to be separat
dust by means of a fine
grosser parts by means of
—*Dose.* 10 to 30 grs., in a
chalybeate; in larger dose
vermifuge, especially for as
thread-worm.

IRON LIQ'UOR. *Syn.*
IRON, DYER'S ACETATE OF
TAR IRON L.; FERRI AC
This article, so extensively
a crude mixed acetate of
sesquioxide of iron. It is
one or other of the followin

1. Old scraps of iron (h
plate, &c.) are left in a ca
acid, occasional agitation
to, until a sufficiently stro
tained. By keeping the aci
in suitable vessels it will
with the iron in a few days.
on a large scale, forty day
quired to complete the proc

2. A solution of pyroligni
of lime, is added to another
as long as a precipitate
repose, the clear liquor is de

IRON, REDUCED. *Syn.*
FERRUM REDACTUM (B.P.),
FER REDUIT, F. *Prep.* This
consists of metallic iron in a fi
mixed with a variable am
oxide of iron, is made by pa
hydrogen over peroxide of i
ness in a gun-barrel.

Prop. A grayish-black
by the magnet, and exhibitin
when rubbed with firm pre
Rapidly absorbs oxygen, an
be preserved from the air
bottles. It dissolves in hyd
the evolution of hydrogen.
to an aqueous solution of 5
and 50 grains of iodide of p
gested with them in a smal
heat, should leave not mo
undissolved, which should
in hydrochloric acid.

Uses. In *medicine,* it is
restore the condition of the b
states of the system. The
lent state of iron so conve

no taste, and only a very
ed.—*Dose.* 1 to 5 grains
ain), in powder, pill, or be-
itter.

Syn. FERRUM IN FILA
), FERRI FILUM (Ph. E.),
D.), L. This is the only
ron retained in the Ph. L.
preparations of iron.

a *pathology*, retention, stop-
n of the urine.

Syn. ICHTHYOCOLLA, L.
f isinglass are obtained from
the genus *Acipenser*, or
n the great sturgeon being
esteemed. It is the air-bag,
r, or sound, dried without
tion than opening, folding,
be picked or cut isinglass of
of the lumps of staple isin-
reds by women and children,
s.

ood isinglass is the purest
own. Its quality is deter-
iteness, absence of the least
eady and almost entire solu-
water; the solution forming
scentless, semi-transparent,
cold. It is soluble in weak
olution is precipitated by al-
eous solution is not precipi-
f the common strengths. 1
glass dissolved in 25 parts of
a rich, tremulous jelly. It is
dulterated. See GELATIN.

In *chemistry*, identity of
h dissimilarity of properties.
nds (isomerides) are such as
e elements in the same pro-
ich differ from each other in
roperties; thus, formate of
ate of methyl are isomeric,
the same ultimate composi-
fering in the arrangement of

M. In *chemistry*, the quality
dies differently composed of
me crystalline form. Isomor-
s are found to be closely allied
l nature; and the fact of two
sing in the same form has
e discovery of other points of
een them. The alums, for
atter what their components,
n octahedra, and a crystal of
, if transferred to a solution of
vill continue to increase with
ity from the deposition of the

. FONICULUS, L. In *surgery*,
l ulcer formed on any part of
ans of caustic or the lancet,
by daily introducing an ISSUE
h some digestive or stimulating
whole being duly *secured by an*
ign.

ISSUE PEAS. *Syn.* PISÆ PRO FONTICULIS, L. Those of the shops are the immature fruit of the orange tree (ORANGE BERRIES). They are usually smoothed in a lathe. Issue peas are also 'turned' from orris root. The following compound issue peas are occasionally employed:—

1. Orris root (in powder) and Venice turpentine, of each, 1 part; turmeric, 2 parts; bees' wax, 3 parts; melted together and made into peas whilst warm.

2. Bees' wax, 3 parts; melt, add of Venice turpentine, 1 part; mix, and further add, of turmeric, 2 parts; orris root (in powder), 1 part; mix well, and form the mass into peas whilst warm. More irritating than the common pea.

3. (Dr. Gray.) Bees' wax, 12 parts; verdigris and white hellebore, of each, 4 parts; orris root, 3 parts; cantharides, 2 parts; Venice turpentine, q. s. *Used* to open issues instead of caustic, but their employment requires care.

ISSUE PLAS'TERS. See PLASTERS.

ITCH. *Syn.* YOUK‡, SCOTCH FIDDLE‡; PSORA, SCABIES, L.; GALE, Fr. In *pathology*, a cutaneous disease, caused by a minute insect lodging under the skin, and readily communicated by contact. There are four varieties of itch, distinguished by nosologists by the names—*scabies papuliformis*, or rank itch;—*scabies lymphatica*, or watery itch; *scabies purulenta*, or pocky itch; *scabies cachectica*, a species exhibiting appearances resembling each of the previous varieties. Our space will not permit more than a general notice of the common symptoms, and the mode of cure which is equally applicable to each species, and will not prove injurious to other skin diseases simulating the itch.

The *common itch* consists of an eruption of minute vesicles, principally between the fingers, bend of the wrist, &c., accompanied by intense itching of the parts, which is only aggravated by scratching. The usual treatment is repeated applications of sulphur-ointment (simple or compound), well rubbed in, once or twice a day, until a cure is effected; accompanying its use by the internal exhibition of a spoonful or more of flowers of sulphur, mixed with treacle or milk, night and morning. Where the use of sulphur-ointment is objectionable, a sulphur bath, or a lotion or bath of sulphurated potash, or of chloride of lime, may be employed instead. See BATH, LOTION (Itch), OINTMENT, PSORIASIS, &c.

I'VORY. The osseous portion of the tusks and teeth of the male elephant, the hippopotamus, wild boar, &c. That of the narwhal or seahorse is the most esteemed, on account of its superior hardness, toughness, translucency, and whiteness. The dust or shavings (IVORY DUST, IVORY SHAVINGS) of the turner, form a *beautiful size* or jelly when boiled in water. VEGETABLE IVORY is the hard albumen of the seed of the *Phytelephas macrocarpa*, one of the Palm family.

Ivory may be *dyed* or *stained* by any of the ordinary methods employed for woollen, after being freed from dirt and grease; but more quickly as follows:—

1. Black. The ivory, well washed in an alkaline lye, is steeped in a weak neutral solution of nitrate of silver, and then exposed to the light, or dried and dipped into a weak solution of sulphide of ammonium.

2. Blue. Steep it in a weak solution of sulphate of indigo which has been nearly neutralized with salt of tartar, or in a solution of soluble Prussian blue. A still better plan is to steep it in the dyer's green indigo-vat.

3. Brown. As for black, but using a weaker solution of silver.

4. Green. Dissolve verdigris in vinegar, and steep the pieces therein for a short time, observing to use a glass or stoneware vessel; or, in a solution of verdigris, 2 parts; and sal ammoniac, 1 part, in soft water.

5. Purple. Steep it in a weak neutral solution of terchloride of gold, and then expose it to the light.

6. Red. Make an infusion of cochineal in liquor of ammonia, then immerse the pieces therein, having previously soaked them for a few minutes in water very slightly acidulated with aquafortis.

7. Yellow. *a.* Steep the pieces for some hours in a solution of sugar of lead, then take them out, and when dry, immerse them in a solution of chromate of potassa.

b. Dissolve as much of the best orpiment in solution of ammonia as it will take up, then steep the pieces therein for some hours; lastly, take them out and dry them in a warm place, when they will turn yellow.

Ivory is etched or engraved by covering it with an etching ground or wax, and employing oil of vitriol as the etching fluid.

Ivory is rendered flexible by immersion in a solution of pure phosphoric acid (sp gr. 1·13,) until it loses, or partially loses, its opacity, when it is washed in clean cold soft water, and dried. In this state it is as flexible as leather, but gradually hardens by exposure to dry air. Immersion in hot water, however, restores its softness and pliancy. According to Dr. Ure, the necks of some descriptions of infants' feeding bottles are thus made.

Ivory is whitened or bleached by rubbing it with finely powdered pumice-stone and water, and exposing it to the sun, whilst still moist, under a glass shade, to prevent desiccation and the occurrence of fissures; observing to repeat the produce until a proper effect is produced. Ivory may also be bleached by immersion for a short time in water holding a little sulphurous acid, chloride of lime, or chlorine, in solution; or by exposure in the moist state to the fumes of burning sulphur, largely diluted with air.

Ivory is wrought, turned, and fashioned, in a similar manner and with sim
used for bone and soft brass.

Obs. Bone for ornamental
in a similar way to ivory, b
owing to its inferior value.
ing animals may be dyed b
with their food. The bones
may thus be tinged of a
hours, and of a deep scarle
but the bones of adult ani
fortnight to acquire a rose c
nearest the heart become t
In the same way logwood a
wood will tinge the bones
purple. (Gibson.)

IVORY BLACK. See Bl

JAG'GERY. *Syn.* Palm
brown sugar made in India,
of the juice of several speci
following are the principal
product:—

1. Cocoa jaggery. Fro
Cocoa-nut palm (*Cocos nuci*

2. Malabar jaggery.
the Gummut palm (*Saguera*

3. Mysore jaggery. F
the wild Date-palm (*Phœn*
galls. yield 46 lbs.

4. Palmyra jaggery.
the Palmyra palm (*Borass*
6 pints yield 1 lb.

JA'LAP. *Syn.* Jalapæ
B. P. (Ph. L. & D.) Convolvu
(Ph. E.), L. The dried tub
gonium purga, I. jalapa—(B
powerful stimulant and
producing copious liquid sto
diciously administered, both
cious. It appears to be in
action between aloes and s
10 to 30 grs., in powder; in
bral affections, dropsies, obst
tion, worms, &c. Owing to
perties, its use is contra-ind
matory affections of the alim
after surgical operations co
abdomen and pelvis. It is
tered in combination with s
or bitartrate of potassa and
curials, as the case may indic
is very generally adulterated.

Res'in of Jalap. *Syn.* Re
Prep. 1. (Ph. E.) See Ex

2. (Nativelle.) Jalap ro
boiling water for 24 hours, a
duced to thin slices, more wa
the whole boiled for 10 mi
sional agitation; the liquid
in a tincture press, and the b
ing repeated a second and
decoctions by evaporation yi
tract of jalap); the pres
treated with rectified spirit,
for 10 minutes, and then

pressed out, and the boiling
ol and expression is repeated
nimal charcoal is added to the
and, after thorough agitation,
ltered; the liquid is now dis-
ing passes over, the superna-
red off the fluid resin, and the
spreading it over the surface
and continuing the heat. The
ble and nearly colourless resin,
rhite powder resembling starch.
of pure resin.
Resinous extract of jalap is
tified spirit, the tincture agi-
ial charcoal, and after filtration
ed to dryness.
lap resin of commerce is gene-
d with scammony, gum guaia-
When in a state of purity, it
n emulsion with milk, like scam-
it runs into a solid mass. It is
xed oils and turpentine, whilst
esins are freely soluble in those
s alcoholic solution, dropped on a
bent white paper, and exposed
of nitrous gas, does not acquire a
e colour; if it does, guaiacum
nt. 2% of this adulteration may
ted. (Gobley) It is insoluble in
iaiacum resin, common resin, and
are so; the decanted ether should
palescent when mixed with water,
vaporate without leaving any re-
wdered jalap resin placed in cold
ot dissolve, but forms a semi-fluid,
mass, as if it had been melted.
a watch-glass with a little oil of
h crimson-coloured solution is ob-
which, in a few hours, a brown
separates. These last two cha-
distinguish it from other resins.
thenware or well-tinned copper
t alone be used in the above pro-
ontact with copper or iron turns
ack, and this tinge can only be re-
redissolving the resin in alcohol,
n of animal charcoal, and re-evapo-

in is an energetic cathartic.—*Dose.*
See Jalapin.
ctitious Resin of. *Syn.* Resinæ
ctitia, L. A substance frequently
lap resin is made by fusing a mixture
low resin and scammony resin, and
hen it has cooled a little, but still
a few drops of balsam of Peru or
mixture is then poured into small
ules or tin moulds. Its effects re-
e of jalap resin, but it inflames less.
)

ap of. ***Syn.*** Sapo jalapæ, Sapo
, L. ***Prep.*** (Ph. Bor.) Resin of
Castile soap, of each 1 part; recti-
2 parts, or q. s. to dissolve the in-
ed by a gentle heat; *subsc-*
the mixture by the heat of a water bath until reduced to 4½ oz., or it has acquired the consistence of a pill-mass.

Prop., &c. A grayish-brown mass, soluble in rectified spirit. Said to be milder in its action than the resin alone.—*Dose.* 5 to 15 oz.

JALAP'IC ACID. *Syn.* Odorous principle of jalap—Pereira. *Prep.* Add an alcoholic solution of acetate of lead to a similar solution of jalap resin, collect the precipitate (jalapate of lead), and throw down the lead by means of sulphuretted hydrogen. (See Absinthic Acid.) A brownish, soft, greasy substance, smelling strongly of jalap, soluble in alcohol and alkali, and slightly so in ether. Jalap resin contains about 13% of this substance.

JAL'APIN. $C_{34}H_{56}O_{16}$. *Syn.* Jalapina. Jalap resin is commonly sold under this name, but pure jalapin is prepared by one or other of the following formulæ:—

Prep. 1. The liquid filtered from the jalapate of lead in preparing jalapic acid is a solution of acetate of jalapin, which, after any trace of lead is removed, by adding a few drops of dilute sulphuric acid, and filtration, yields the whole of its jalapin, as a precipitate, on the addition of 5 or 6 times its volume of water; this is collected, washed with a little cold distilled water, and dried by exposure to a current of warm dry air.

2. (Hume.) Coarsely powdered jalap is digested in strong acetic acid for 14 days, the tincture filtered, ammonia added in excess, and the whole agitated strongly; the mixture is then filtered, the deposit washed in cold water, redissolved in acetic acid, reprecipitated by ammonia, and again washed and dried.

3. (Kayser.) Pure jalap resin, in powder, is digested for some time in boiling ether, by which means the jalapic acid is removed, and pure jalapin remains undissolved.

Prop., &c. A transparent, colourless, scentless, insipid resin, very soluble in alcohol, but insoluble in ether. It is the active purgative principle of crude jalap resin.

JAMAI'CINE. *Syn.* Jamaicina. A peculiar alkaloid obtained by Huttenschmidt from the bark of the Cabbage-tree (*Andira inermis.*)

Prep. The aqueous solution of cabbage-tree bark, treated with sulphuretted hydrogen and evaporated.

Prop. Yellow crystals soluble in water and, to a limited extent, in alcohol; fusible, and very bitter tasted. It forms salts with the acids, which, in small doses, produce restlessness and trembling; and in larger ones, purging. It is said to be vermifuge.

JAMES'S POWDER. See Powders.

JAMS. *Syn.* Preserves. Conserves of fruit with sugar, prepared by boiling. In the latter respect they differ from the conserves of the apothecary.

Prep. The pulped or bruised fruit is boiled along with ½ to ¾ of its weight of loaf sugar, [illegible] and white), gooseberries (ripe and green), mulberries, Orleans plums, raspberries, and strawberries. Red currants are commonly added to the last, to remove insipidity.

JAPAN′. See VARNISH, and *below*.

JAPAN′NING. The art of covering paper, wood, or metal, with a coating of hard, brilliant, and durable varnish. The varnishes or laquers employed for this purpose in Japan, China, and the Indian Archipelago, are resinous juices derived from various trees belonging to the natural order *Anacardiaceæ*, especially *Stagmaria verniciflua*, *Holigarna longifolia*, *Semecarpus Anacardium*, and species of *Rus* (Sumach). For *use*, they are purified by a defecation and straining, and are afterwards mixed with a little oil, and with colouring matter, as required. In this country varnishes of amber, asphaltum, or copal, or mixtures of them, pass under the names of 'JAPAN' and 'JAPAN VARNISH.'

Proc. The surface is coloured or painted with devices, &c., as desired, next covered with a highly transparent varnish (amber or copal), then dried at a high temperature (135° to 165° Fahr.), and, lastly, polished. Wood and paper are first sized, polished, and varnished. For plain surfaces asphaltum varnish or japan is used. See VARNISHING.

JAPON′IC ACID. $C_{12}H_{10}O_5$. When catechu is exposed to the air in contact with caustic alkalies, black solutions (alkaline japonates) are formed; with carbonated alkalies, red solutions (alkaline rubates); the acid of the former may be separated. It is a black powder, insoluble in water, soluble in alkalies, and precipitated by acids. Buric acid forms red insoluble compounds with the earths and some

[illegible]
seous odour; is solid at 2
35° Fahr. It forms salts w
of which possess any practi

JAU′MANGE. *Prep.* F
boiling water, 12 oz.; di
sweet white wine, ½ pint;
beaten to a froth, and the
of 2 lemons; mix well, an
over the fire until sufficie
ring all the time; lastly, s
it into moulds.

JAUN′DICE. *Syn.* ICT
TEOLUS, L. A disease cha
low colour of the eyes and
urine, and pale alvine evacu
to arise from a disordered a
organs. The treatment co
nistration of saline aperien
of blue-pill, followed by toni
The action of these remed
moted by the copious use o
larly saline water), and ex
air, when possible. When
and vomiting, anodynes (o
&c.) may be administered.
in itself a dangerous dise
times lays the patient open
which are so.

JEL′LY. *Syn.* GELATIN
very loosely applied to variou
are liquid or semi-liquid w
come gelatinous on cooling.

Jellies are coloured by
usual stains used by conf
rendered transparent by
white of egg.

Al′mond Jelly. *Syn.* G
LARUM, L. *Prep.* From

combined with rich beef

Syn. Panada; Gelatina
. Cut a French roll into slices,
ach side, and boil in water,
e whole forms a jelly, adding
uired; strain, and add sugar,
te. It may be made with broth
fat has been skimmed, instead
as the last.
Syn. Soup-jelly. From broth
ich the fat has been skimmed,
it becomes gelatinous on cool-
eds of isinglass are commonly
(Portable).
lly. *Prep.* For each foot take
ts, and boil to one half; cool,
t, and again boil for 2 or 3
e peel of a lemon and a little
t from the fire, strain through
iltration), add the juice of a
lass of wine, and when it has
ut it into glasses or 'forms.'
jelly is required to be very
must be treated as follows:—
removed, it should be gently
enough to melt it, next well
e white of an egg and the sea-
n brought to a boil for a minute
it will be ready for straining,
es' feet should not be bought
but only scalded. Cows' feet
make nearly as good jelly as
s' feet, and are much more eco-

Jelly. *Syn.* Gelatina graci-
ep. (Dr. Sigmond.) Boil Ceylon
aria lichenoides), ½ oz. in water,
minutes, or till the liquid jellies
train and flavour. Very nutri-
ended in irritation of the mucous
d phthisis.
s Jelly. *Syn.* Gelatina hel-
, D. *Prep.* (P. Cod.) Corsican
laria Helminthocorton), 1 oz.;
boil 1 hour, and strain 8 fl. oz.;
f isinglass (previously soaked in
), 1 dr.; refined sugar, 2 oz.;
wine-glassful. Vermifuge. See

. Under this head we include
ade from the juices of fruits.
strained juice mixed with ⅓ to ½
refined sugar, until it 'jellies' on
rving to carefully remove the
es. The process should be con-
gentle heat, and it is preferable
he sugar until the juice is some-
rated, as by lengthened boiling the
sugar is injured.
are sold in pots or glasses, like
jams and fruit jellies are refrige-
ative; they are, however, mostly
relishes, especially during fevers
nesses. The principal fruit jellies
, cherry (from either Cornelian or Kentish cherries), currant (black, white, and red), elderberry, gooseberry, plum, quince, raspberry. See Lemon and Orange Jelly.

Gra''vy Jelly. By evaporating meat gravies.

Harts'horn Jelly. *Syn.* Gelatina cornu cervi, L. *Prep.* (P. Cod.) Hartshorn shavings, 8 oz.; wash it in water, then boil in clean water, 3 pints, till reduced to one half; strain, press, add of sugar, 4 oz., the juice of one lemon, and the white of an egg beaten up with a little cold water; mix well, clarify by heat, evaporate till it jellies on cooling, then add the peel of the lemon, and set it in a cool place. It may be flavoured with wine, spices, &c. Very nutritious.

Ice'land Moss Jelly. *Syn.* Gelatina lichenis, L. *Prep.* (P. Cod.) Iceland moss, 2 oz.; soak for 1 or 2 days in cold water, then boil for 1 hour in water, q. s. to yield a strong solution; strain, decant the clear after repose, apply heat, and dissolve therein of isinglass, 1 dr.; evaporate the whole to a proper consistence, put it into pots, and set them in a cool place. Nutritious. Recommended in phthisis. The jelly of Iceland moss and cinchona (gelatina lichenis cum cinchona—P. Cod.) is made by adding to the above, syrup of cinchona, 6 fl. oz.

I''rish Moss Jelly. *Syn.* Gelatina chondri, L. *Prep.* From Irish or carrageen moss. See Decoction.

I''singlass Jelly. *Syn.* Confectioners' jelly; Gelatina ichthyocollæ, L. *Prep.* From isinglass dissolved in water by boiling, and evaporated till it 'jellies' on cooling, adding flavouring, as desired. 1¼ oz. of good isinglass makes fully a pint of very strong jelly. See Blancmange, Isinglass, Calves'-feet Jelly, &c.

Lem'on Jelly. From isinglass, 2 oz.; water, 1 quart; boil, add of sugar, 1 lb., clarify, and when nearly cold, add the juice of 5 lemons, and the grated yellow rinds of 2 oranges and of 2 lemons; mix well, strain off the peel, and put it into glasses.

No'yeau Jelly. As punch jelly, but strongly flavoured with bitter almonds.

Or'ange Jelly. From orange juice, 1 pint; let it stand over the grated yellow rind of 3 or 4 of the oranges for a few hours, then strain, and add, of loaf sugar, ½ lb., or more, isinglass, ½ oz., dissolved in water, 1 pint; mix, and put it into glasses before it cools.

Punch Jelly. From isinglass, 2 oz.; sugar, 1¾ lb.; water, 1 pint; dissolve, add of lemon juice, ½ pint; the peels of 2 lemons and of 2 oranges; rum and brandy, of each, ¼ pint; keep it in a covered vessel until cold, then liquefy it by a very gentle heat, strain, and pour it into moulds. A pleasant and deceptive way of swallowing alcohol.

Rice Jelly. *Syn.* Crème de riz. From rice boiled in water, sweetened, and flavoured.

Sa'go Jelly. Prep. Soak sago in cold water for 1 hour, strain, and boil in fresh soft water until it becomes transparent; then add wine, sugar, clear broth, milk, or spices, to flavour. 1 oz. of sugar makes a pint of good jelly.

Tapio'ca Jelly. As the last but using tapioca in lieu of sago.

JES'UIT'S BARK. See Cinchona.

JESUIT'S DROPS. See Drops and Tincture.

JESUIT'S POWDER. Powdered cinchona bark.

JET. A variety of mineral bituminous carbon, very hard, and susceptible of a fine polish.

JEW'ELS. See Diamond, Emerald, Gems, &c.

JEW'ELRY. The gold in articles of jewelry, whether solid or plated, which are not intended to be exposed to very rough usage, is generally 'coloured,' as it is called in the trade. This is done as follows:—

1. (Red gold colour.) The article, after being coated with the amalgam, is gently heated, and, whilst hot, is covered with gilder's wax; it is then 'flamed' over a wood fire, and strongly heated, during which time it is kept in a state of continual motion, to equalise the action of the fire on the surface. When all the composition has burned away, the piece is plunged into water, cleansed with the 'scratch-brush' and vinegar, and then washed and burnished. To bring up the beauty of the colour, the piece is sometimes washed with a strong solution of verdigris in vinegar, next gently heated, plunged whilst hot into water, and then washed, first in vinegar, or water soured with nitric acid, and then in pure water; it is, lastly, burnished, and again washed and dried.

2. (Or-molu colour.) This is given by covering the parts with a mixture of powdered hematite, alum, common salt, and vinegar, and applying heat until the coating blackens, when the piece is plunged into cold water, rubbed with a brush dipped in vinegar, or in water strongly soured with nitric acid, again washed in pure water, and dried. During this process, the parts not to be dried in 'or-molu colour' should be carefully protected.

The frauds practised in reference to the 'fineness' of the metal used in jewelry, is noticed under Gold (Jeweller's). See also Assaying, Diamond, Gems, Gilding Liquor, Gilding Wax, &c.

JEW'S PITCH. See Asphaltum.

JUICE (Spanish). See Extract and Liquorice.

JU'JUBE. A fruit resembling a small plum, produced by various species of *Zizyphus*. Combined with sugar, it forms the jujube paste of the shops, when genuine; but that now almost always sold under the name is a mixture of gum and sugar, slightly coloured and flavoured.

JU'LEP. *Syn.* Julap; Julepum, Julepus, Julapium, L. A term usually regarded as synonymous with 'mixture'; but according to the best authorities, implying a medicine which is used as a vehicle for other forms of medicine. The word comes
French, from a Persian expressi
nifies 'sweet drink.' A julep,
Continental writers, is a drink of
generally composed of distilled
sions, and syrups, to which mucil
are sometimes added; "but neve
oily substances, which could inte
transparency." In England, the
pharmacy are now classed under

JU'NIPER BERRIES. *Syn*
baccæ, J. communis baccæ (P
perus (Ph. L.), L. The fruit of
communis, or common juniper tre
Ph. L. & D. both the tops and
peri fructus et cacumina—
juniperus—baccæ, cacumina—
were ordered. The berries are
diuretic, and have been long empl
sies, either alone or combined
and squills. The tops (summ
been highly praised in scurvy
cutaneous affections.—*Dose* 1 to
into a conserve with sugar, or in
infusion or tea.

JUN'KET. *Syn.* Devonsh
Curd jelly. From warm mil
bowl, and then turned with a
some scalded cream and sugar a
with a sprinkling of cinnamo
without breaking the curd. Muc
holiday folk in the western co
the hot weather of summer. So
strangely, a little brandy finds
these trifles.

KALEIDOSCOPE. *Syn.* Flow
pleasing philosophical toy inv
David Brewster, which presents
series of symmetrical changing
formed as follows:—Two slips of
from 6 to 10 inches long, and
inch wide, and rather narrow
than the other, are joined togeth
by one of their edges, by means
silk or cloth, glued on their b
then placed in a tube of tin
blackened inside, and a little
necessary to contain them, and
means of small pieces of cork, w
at any angle to each other th
aliquot part of 4 right angles (
&c.). The other end of the tube
with an opaque screen, or cover,
a small eyehole is made in th
the other end is fitted, first w
common glass, and at the distan
of an inch, with a plain piece of s
glass, parallel to the former;
mediate place or cell are placed
form the images. These consis
pieces of glass, glass beads, or any
diaphanous bodies, sufficiently
freely in the cell, and to assume
when the tube is shaken or turn
tube so prepared presents an

nd symmetrical pictures, no one be exactly reproduced. This ily constructed, is so very inexat the same time so capable of almost inexhaustible fund of o the young, that we advise our ds to try their hands at its conny common tube of tin or pastes used, and strips of glass smoked will answer for mirrors.

he name formerly applied to a *sola* employed for making BARILLA. nes used as a designation for the es, and is the Germon synonym for

d **Kali.** *Syn.* LEMON AND KALI, D K. A common preparation of or making a pleasant effervescing It is sometimes incorrectly styled potash.' *Prep.* 1. Carbonate of artaric acid, of each, 5 oz.; lump .; all in the state of fine powder, tely dried by a very gentle heat, they are mixed together, flavoured e of lemon, 1 dr., rubbed through a in a warm dry situation, put into d corked down immediately.

y powdered white sugar, 16 lbs.; id, 4½ lb.; carbonate of soda, 4 lbs.; lemon, 1 oz.; as the last. Keeps dessert-spoonful of either thrown sful of water makes a pleasant efferaught.

M. [L.] Potassium.

OR. A cosmetic lotion; it resemLAND'S LOTION,' but is got up in a re pleasing style. See LOTION.

N. *Syn.* CHINA CLAY, PORCELAIN white clay, derived from the decomf the felspar of granitic rocks. The nd porcelain works of this country r supplied with this substance from tracts of it which occur near St. rnwall. See CLAY.

MOR. *Syn.* CAPNOMOR. A colourtained from crude kreasote by disith potassa. It boils at 360° Fahr., liar odour, and is insoluble in water, y soluble in an alkaline solution of

YSIS. *Syn.* CATALYSIS, CONTACT Terms applied to a class of chemical which the decompositions, and the tion of the elements of compound apparently excited by the mere prer contact with, other bodies, which mselves suffer such a change.

The alkaline ashes obtained by arious species of sea-weed, formerly d for the preparation of carbonate The weeds most valued for the re the *Fucus vesiculosus*, *nodosus*, and nd the *Laminari abulbosa* and *digitata*. years, the manufacture of kelp, like rilla, has been *almost abandoned*, *a source of iodine. Mr. E. C. C.* Stanford, by carefully collecting and compressing the weed, and afterwards submitting it to dry distillation, doubles the yield of iodine and bromine, and obtains in addition various valuable hydrocarbons. See BARILLA IODINE, SODA, &c.

KER'MES. *Syn.* KERMES-GRAINS, ALKERMES; GRANUM TINCTORIUM, L. The dried bodies of the female *Coccus Ilicis* of Linnæus, a small insect of the order *Hemiptera*, which flourishes on the Ilex oak. It has been used as a red and scarlet dye-stuff ever since the time of Moses; but is now superseded in this country by cochineal, which gives colours of much greater brilliancy.

KER'MES MIN'ERAL. *Syn.* KERMES MINERALE, K. MINERALIS, L. An amorphous tersulphide of antimony, containing a small admixture of teroxide of animony and sulphuride of potassium. *Prep.* 1. IN THE HUMID WAY.—*a.* (P. Cod.) Carbonate of soda (cryst.), 128 parts (say, 21 parts), is dissolved in water, 1280 parts (say 210 parts), contained in a cast-iron pan; tersulphide of antimony (in fine powder), 6 parts (say 1 part), is next added, and the whole boiled for an hour, with constant agitation with a wooden spatula; the boiling liquid is then filtered into a heated earthen pan containing a small quantity of very hot water, and the solution is allowed to cool as slowly as possible; the red powder which is deposited is collected on a cloth, on which it is well washed with cold water, and the superfluous water being removed by pressure, the powder is dried by a gentle heat, and is, lastly, passed through a fine silk-gauze sieve, and preserved from light and air.

b. (Wholesale.) From black sulphuride of antimony, 4 lb.; carbonate of potassia, 1 lb.; boil in water, 2 galls., for half an hour, filter, &c., as before. The undissolved portion of sesquisulphuret of antimony may be boiled again several times with fresh potassa and water, until the whole is dissolved. Inferior to the last.

c. (CLUZELL'S KERMES.) From tersulphide of antimony, 4 parts; crystallized carbonate of soda, 90 parts; water, 1000 parts; boil, &c., as in 1, *a*, and dry the powder, folded up in paper, at a heat not exceeding 90° Fahr.

2. IN THE DRY WAY.—*a.* (P. Cod.) Carbonate of potassa, 100 parts; tersulphide of antimony, 50 parts; sulphur, 3 parts; mix, fuse in a Hessian crucible, pour the melted mass into an iron mortar, and when cold reduce it to powder; next boil it in water, 1000 parts, contained in an iron vessel, filter the solution, and otherwise proceed as before. *Product:* large, but of inferior quality.

b. (Fownes.) From tersulphide of antimony, 5 parts; carbonate of soda (dry), 3 parts; water, 80 parts; fuse, &c., as before. Nearly equal to 1, *a*.

c. (Berzelius.) Carbonate of potassa (pure), *3 parts;* tersulphide of antimony, 8 parts; *water,* q. s. Resembles the last.

Prop., &c. An odourless, tasteless powder, insoluble in both water and alcohol, and, when pure and carefully prepared, entirely soluble in hydrosulphate of ammonia. As prepared by the formulæ 1, *a*, and 1, *c*, it is a very dark crimson powder, of a velvety smoothness; but that from the other formulæ has a brownish-red colour, more or less deep. The secret of preparing this compound of a fine and velvety quality, like that imported from the Continent, consists simply in filtering the solution whilst boiling hot, and allowing it to cool very slowly, by placing the vessel in an appropriate situation for that purpose. Another important point, according to Rose, is to employ sufficient alkali to keep the whole of the teroxide of antimony in solution as the liquid cools, instead of allowing a part of it to be deposited with the kermes. This is the reason of the superior quality and mildness of that prepared according to the directions of the French Codex. The liquor decanted from the 'kermes mineral' yields the golden sulphide of antimony on the addition of an acid, for which purpose the acetic is generally employed.

Dose. ½ gr. to 3 or 4 grs., as a diaphoretic, cathartic, or emetic. It occupies in foreign practice the place of our James's Powder.

KETCH'UP. *Syn.* CATCHUP, CATSUP, KATCHUP. The juice of certain vegetables strongly salted and spiced, so as to be used as sauce; or a simple sauce made without the natural juice as a substitute for the true ketchup. The following are the principal varieties:—

Camp Ketchup. *Prep.* Take of good old beer, 2 quarts; white wine, 1 quart; anchovies, 4 oz.; mix, heat it to the boiling-point, remove it from the fire, and add of peeled shalots, 3 oz.; mace, nutmegs, ginger, and black pepper, of each, bruised, ½ oz.; macerate for 14 days, with frequent agitation, then allow it to settle, and decant and bottle the clear portion.

Cu'cumber Ketchup. *Prep.* From ripe cucumbers, in the same way as mushroom ketchup. Very luscious. Mixed with cream, or melted butter, it forms an excellent white sauce for fowls, &c.

Marine' Ketchup. *Prep.* Take of strong old beer, 1 gall.; anchovies, 1½ lb.; peeled shalots (crushed), 1 lb.; bruised mace, mustard seed, and cloves, of each, ½ oz.; bruised pepper and ginger, of each, ¼ oz.; mushroom ketchup and vinegar, of each, 1 quart; heat the mixture to the boiling-point, put it into a bottle, and macerate for 14 days, frequently shaking; then strain through flannel, and bottle it for use. Excellent with anything; like the last, it makes good white sauce, and keeps well.

Mush'room Ketchup. *Prep.* 1. Sprinkle mushroom flaps, gathered in September, with common salt, stir them occasionally for 2 or 3 days, then lightly squeeze out the juice, and add to each gallon, cloves and mustard seed, of each, bruised, ½ oz.; allspice, black pepper, and ginger, of each, bruised, 1 oz.; gently heat to the boiling-point in a covered vessel, macerate for 14 days, and decant or strain. exhibit any indications of chan weeks, bring it again to the b with a little more spice, and a t more salt.

2. Take of mushroom juice, mento, 2 oz.; cloves, black pep seed, and ginger, of each, bruised, 1 lb., (or to taste); shalots, 3 simmer for 1 hour in a covered strain, and bottle.

3. Take of mushroom juice, black pepper, 9 lb.; allspice, 7 5 lb.; cloves, 1 lb. (all bruised); gently simmer in a covered tin hour.

Oys'ter Ketchup. *Prep.* Pulp and to each pint add, of sherry w strong old ale, 1 pint; salt, 1 oz.; black pepper, 1 dr.; simmer very 10 minutes, strain, cool, bottle, bottle add a spoonful or two of keep them in a cool situation. Coc UP and MUSSEL KETCHUP are n same way. *Used* to flavour sauce fish are out of season; excellent steak, &c.

Pon'tac Ketchup. *Prep.* Take of elderberries and strong vinegar pint; anchovies, ½ lb.; shalots and to flavour; boil for 5 minutes, cool, bottle. *Used* to make fish sauces.

Toma'to Ketchup. *Prep.* Pre tomatoes or love apples, like mushro except that a little very strong C is commonly added. An admirabl 'high' or rich flavoured viands.

Wal'nut Ketchup. *Prep.* 1. expressed juice of young walnuts, w 1 gal.; boil 10 minutes, skim, ad vies, 2 lbs.; shalots, 1 lb.; cloves a each, 1 oz.; 1 clove of garlic, slic in a covered vessel for 15 minutes, and bottle, adding a little fresh s bottle, and salt, q. s. Will keep cool place for 20 years.

2. Take of green walnut shells salt, 5 lbs.; mix and beat together press out the liquor, and to every of allspice, 4 oz.; ginger, 3 oz.; cloves, of each, 2 oz.; all bruised; half an hour, and set aside in a and in a cool situation until suffici

3. Take of walnut juice, 1 gal.; quart; British anchovies (sprats), pimento, 3 oz.; ginger, ¼ oz.; lon oz.; cloves, 1 oz.; shalots, 2 oz. bottle, as before.

4. From the juice of walnut shell salt, 1 bushel; allspice and shalo 6 lbs.; ginger, garlic, and horse each, 3 lbs.; essence of anchovies, before.

Wine Ketchup. *Prep.* Take of or walnut ketchup, 1 quart; chop vies, ¼ lb.; 20 shalots; scraped ho

q. s.; simmer for 15 minutes,
of white and red wine, of each, 1
te for 1 week, strain, and bottle.
marks. In preparing the above
ls of glazed earthenware, or stone-
-tinned copper pans, should alone
ntain them whilst being boiled or
ilt and vegetable juices rapidly
er, and render the ketchup poi-
thing in the shape of copper, lead
hould be allowed to touch them
d copper spoon left in a bottle of
some time will render its contents
Unpleasant and even dangerous
ting, colic, and diarrhœa, have re-
the neglect of this precaution.
&c.

The vulgar name for ulcerated

S. *Syn.* Renes, L. (In *anatomy.*)
ys, as almost every one knows, are
viscera which secrete the urine, and
reat channels by which the effete
s matter is removed from the blood.
subject to various affections, both
and organic, chronic and acute, of
e are imperfectly understood, and
y admit of alleviation, but not of
d. See Urine and Urinary Af-

. (In *cookery.*) Soyer recommends
be dressed by gently broiling them,
viously split them, "so as nearly to
m, leaving the fat in the middle,"
a skewer through them, that they
n open." After being rubbed with
itter, and seasoned with salt and
hey may be served on toast, or with
" "You may also egg and bread-
m." "Five minutes suffice for a
lamb's kidney of common size."
One or two lamb's kidneys, plainly
l served up with the gravy in them,
g with a little dry-toasted bread,
most excellent and appropriate
r dinner for a dyspeptic or conva-

CUP. *Prep.* Yellow peel of 1
np sugar, 1½ oz.; cold water, 1 pint;
10 hours, and strain. The addition
oonful of orange-flower water is a
rovement. *Used* as a diluent in
e acid liquors are inadmissible. See

EVIL. See Scrofula.

YELLOW. See Yellow Pig-

ACID. $HC_7H_{11}O_6$. *Syn.* Quinic
chonic acid. A peculiar dibasic
rring in the cinchona barks, in
exists associated with the alkaloids.
is readily obtained from kinate of
he action of dilute sulphuric acid;
d solution evaporated to the con-
f a syrup, gradually deposits large
sembling those of tartaric acid.

Prop., &c. It is soluble in 2 parts of water, and in alcohol; and forms salts called kinates. Kinate of lime is obtained from an acidulated infusion of cinchona bark, by adding an excess of lime, filtering, evaporating to a syrup, and setting the liquid aside to crystallise. These crystals are purified by redissolving them, treating the solution with a little animal charcoal, and crystallising the salt as before. The liquid from which the bark-alkaloids have been precipitated by hydrate of lime affords an almost inexhaustible supply of this salt. See Kinone.

KI'NO. *Syn.* Gum kino; Kino (B. P., Ph. L. E. & D.) The juice flowing from the incised bark of the *Pterocarpus Marsupium* or Indian, hardened in the sun.—*Dose.* 10 to 30 grs., in powder; as an astringent in chronic diarrhœa, &c.

Factitious Kino, met with in the shops, is made as follows:—Logwood, 48 lbs.; tormentil root, 16 lbs.; madder root, 12 lbs.; exhaust by coction with water, q. s.; to the liquor add of catechu, 16 lbs.; dissolve, strain, and evaporate to dryness. *Prod.* 24 lbs. Extract of mahogany is also commonly sold for kino.

KIRSCH'WASSER (-väs ser) [Ger.]. *Syn.* Kirschenwasser. A spirituous liquor distilled in Germany and Switzerland from bruised cherries. From the rude manner in which it is obtained, and from the distillation of the cherry-stones (which contain prussic acid) with the liquor, it has frequently a nauseous taste, and is frequently poisonous. When properly made and sweetened, it resembles noyau.

KISH. An artificial graphite occasionally produced in iron-smelting furnaces. It occurs in brilliant scales, and is said to possess peculiar efficacy in certain forms of anæmia and chlorosis.

KITCH'EN. The late Alexis Soyer set down as one of the crying faults of our countrymen, the employment of an apartment for the kitchen which is either too small or inconveniently situated, and which, in general, is not sufficiently provided with 'kitchen requisites.' "As a workman cannot work properly without the requisite tools, or the painter produce the proper shade without the necessary colours, in like manner does every person wishing to economise his food, and to cook it properly, require the proper furniture wherewith to do it." The neglect of these matters, which is so general, is, undoubtedly, a mischievous and deceptive economy.

KNOX'S POW'DER. *Prep.* From common salt, 8 parts; chloride of lime, 3 parts; mixed together. An ounce of it dissolved in a tumblerful of water furnishes a solution which is similar to Labarraque's disinfecting fluid.

KŒCHLIN'S LIQUID. *Prep.* From copper filings, 96 grs.; liquor of ammonia, 2 fl. oz.; digested together until it turns of a full blue colour, and then mixed with hydrochloric acid,

listilled water, 5 lbs.—*Dose.* 1 to 2
s daily; in scrofula. It is poison-
; doses.
LA NUT. See Nux Vomica.
SS. A liquor prepared by the Cal-
rmenting mare's milk, previously
sour, and then skimmed. By dis-
yields a spirit called rack, racky, or
lbs. of fermented milk yield about
w wines, and this, by rectification,
¼ pint of strong alcohol.
. *Syn.* Cusso, Kosso. This sub-
e dried flowers of the *Brayera an-*
, an Abyssinian tree which grows to
of about 20 feet, and belongs to
order *Rosaceæ.* It is one of the
ive remedies known for both va-
ape-worm. The dose, for an adult,
drs., in powder, mixed with about
of warm water, and allowed to
r 15 or 20 minutes. The method
for its successful administration is
—The patient is to be prepared by
or a lavement, and the use of a
diet the day before. The next
sting, a little lemon juice is to be
or a portion of a lemon sucked,
the dose of kousso (both liquid and
3 or 4 draughts, at short intervals
er, each of which is to be washed
cold water acidulated with lemon
action of the medicine is subse-
moted by drinking weak tea with-
milk or sugar, or water flavoured
juice or toasted bread; and if it
rate in the course of 3 or 4 hours, a
or oil or a saline purgative is taken.
ur of kousso is rather disagreeable
ing. Its operation is speedy and
ut at the same time it is apt to
large doses, great prostration of
nd other severe symptoms, which
administration to the delicate of
or during pregnancy or affections
er viscera. Care should be taken
hase it in powder, as, owing to its
it is uniformly adulterated. The
ousso of the shops is, in general,
re than the root-bark of pomegra-
ed and scented.
TE. *Syn.* Creasote, Creosote,
; Creasotum (B. P., Ph. L. & D.),
(Ph. E.), L. A peculiar substance,
by Reichenbach, and so named on
ts powerful antiseptic property. It
t of the dry distillation of organic
is the preservative principle of wood
pyroligneous acid.
reasote is manufactured from wood-
h it is sometimes contained to the
20$\frac{0}{0}$ to 35$\frac{0}{0}$, and from crude pyrolig-
and pyroxilic oil.
Cod.) Wood-tar is distilled in a
n retort until white vapours of
ear; the heavy oily matter which
lower layer of the product is collected, washed with water slightly acidulated with sulphuric acid, and then distilled in a glass retort, rejecting the first portions, which are chiefly eupion; the distillate is treated with a solution of potassa (sp. gr. 1·12), the mixed, liquids being shaken strongly together; after it is settled, the layer of eupion which forms is removed from the surface, and the potash-solution of kreasote exposed to the air until it becomes black; it is then saturated with dilute sulphuric acid, the watery liquid rejected, and the remainder (consisting of crude kreasote) submitted to distillation in glass; the treatment by exposure, potassa, sulphuric acid, and distillation, is repeated three times or oftener, until the combination of kreasote and potassa ceases to become coloured by the action of the air; it is, lastly, saturated with concentrated phosphoric acid, and again distilled, rejecting the first portion that comes over.

2. (M, Simon.) A copper still, capable of containing 80 Berlin quarts, is filled to one third with the oil of wood-tar, and heat is applied; first, the more volatile matters pass over; these do not contain kreasote, and are, therefore, rejected; but when, by gradually increasing the temperature, there passes over a very acid liquid, which becomes turbid, and at the same time an oil separates from it when mixed with water, the product is collected, and the distillation continued until the operator notices a squirting in the still, when this part of the process is complete; the distilled product is then nearly saturated with potassa, and returned to the still, which, in the mean time, has been well cleaned out, and about half filled with water, and the distillation is recommenced; at first an oil comes over, which floats on water, and which consists chiefly of eupion, and is, therefore, rejected; as soon, however, as the oil begins to sink in the water which comes over with it, it is charged with kreasote, and is carefully collected; the distilling aqueous fluid being reintroduced, from time to time, into the still, and the distillation continued so long as any oil continues to come over with it; the heavy oily distillate is now agitated with liquor of potassa, sp. gr. 1·120; the portion which remains undissolved is eupion, and is skimmed off; the potassa-solution of kreasote still, however, contains a considerable quatity of eupion, the greater portion of which may be separated by dilution and distillation with an equal quantity, or with at least $\frac{4}{5}$ths of its volume of water, fresh water being added from time to time, as long as any eupion comes over with the distilled liquor; when this has ceased to pass over, sulphuric acid is poured into the still in quantity exactly sufficient to saturate ⅓rd only of the potassa formerly employed, and the distillation is again renewed; kreasote now distils over, the first portions of which, however, still contain eupion, after which pure kreasote follows; that is to say, "a kreasote which, when mixed with 6 or 8 times its quantity of a solution of pure

potassa, furnishes a mixture which, by the addition of any further quantity whatever of water, does not become turbid." The combination of kreasote remaining in the still is now mixed with sulphuric acid in slight excess, and the distillation renewed, the water coming over with it being from time to time returned into the still; and when no further oil passes over with the water, the process is complete. The kreasote thus obtained is redistilled with the water which has passed over with it, whilst the distilled water, as before, is allowed from time to time to run back into the still. The kreasote thus obtained is then colourless; but it contains a considerable quantity of water in solution, which is separated by distillation in a glass retort. The water distils first, and then kreasote, which, after cleaning the neck of the retort from the water, must be received in another dry receiver. If the kreasote assumes a red colour after being exposed for some time to the air, it must be re-distilled, and then it keeps very well. Korne found that tar prepared from turf furnishes much more kreasote than that from fir-wood, &c.

3, (Ure.) In operating upon pyroligneous acid, if we dissolve effloresced sulphate of soda in it to saturation, at the temperature of 267° Fahr., the kreasote separates, and floats upon the surface; it is then decanted, and left in repose for some days, during which it deposits a fresh portion of salt and vinegar; it is next saturated whilst hot with carbonate of potassa, and distilled along with water; a pale yellow oily liquid passes over, which is rectified with phosphoric acid, &c., like the crude product of kreasote from tar.

Prop. Kreasote is a colourless, transparent liquid, heavier than water, of a peculiar unpleasant, penetrating odour, resembling that of smoked meat, and a very pungent and caustic taste; its vapour irritates the eyes; it boils at 400 Fahr., and is still fluid at — 16·6° Fahr.; it produces on white filter paper greasy spots, which disappear if exposed to a heat of 212° Fahr.; dissolves in 80 parts of water, and mixes in all proportions with spirit of wine, the essential and fatty oils, acetic acid, naphtha, disulphide of carbon, ammonia, and potass; it dissolves iodine, phosphorus, sulphur, resins, the alkaloids, indigo blue, several salts (especially the acetates and the chlorides of calcium and tin); reduces the nitrate and acetate of silver; is resinified by chlorine, and decomposed by the stronger acids. The aqueous solution is neutral, and precipitates solutions of gum and the white of eggs. It kindles with difficulty, and burns with a smoky flame. When quite pure, it is unaltered by exposure to the air. Sp. gr. 1·071, at 68° Fahr. A slip of deal dipped into it, and afterwards in hydrochloric acid, and then allowed to dry in the air, acquires a greenish-blue colour. It turns a ray of polarised light to the right, whereas carbolic acid does not affect polarisation.

Pur. The fluid commonly sold in the shops for kreasote, is a mixture of kreasote, picamar, and light oil of tar; in many cases it is little else than impure carbolic acid, with scarcely a trace of kreasote. Pure kreasote is perfectly soluble in both acetic acid and liquor of potassa; shaken with an equal volume of water in a narrow test-tube, not more than the 1-80th part disappears; otherwise it contains water, of which kreasote is able to assume 1-10th without becoming turbid.—If it can be dissolved completely in 80 parts by weight of water, at a medium temperature, it then forms a perfectly neutral liquid.—An oily residue floating on the surface betrays the presence of other foreign products (EUPION, KAPNOMOR, PICAMAR), which are obtained at the same time with the kreasote during the dry distillation of organic substances.

Kreasote is "devoid of colour, has a peculiar odour, and is soluble in acetic acid. When it is dropped on bibulous paper, and a boiling heat is applied for a short time, it entirely escapes, leaving no transparent stain." (Ph. L.) "Entirely and easily soluble in its own weight of acetic acid." (Ph. E.) Sp. gr. 1·046 (Ph. L.), 1·066 (Ph. E. & D,). The density and boiling-point of absolutely pure kreasote is given above. When prescribed in pills with oxide of silver, the mass will take fire unless the oxide be first mixed with liquorice or other powder. (Squire.)

Uses. Kreasote has been recommended in several diseases of the organs of digestion and respiration, in rheumatism, gout, torpid nervous fever, spasms, diabetes, tape-worm, &c.; but its use has not, in general, been attended with satisfactory results. It is given in the form of pills, emulsion, or an ethereal or spirituous solution. *Externally*, it has been employed in various chronic diseases of the skin, sores of different kinds, mortifications, scalds, burns, wounds (as a styptic), caries of the teeth, &c.; mostly in the form of an aqueous solution (1 to 80); or mixed with lard (5 drops to 1 dr.), as an ointment; dissolved in rectified spirit, it forms a useful and a popular remedy for toothache arising from decay or rottenness. In the *arts*, kreasote is extensively employed to preserve animal substances, either by washing it over them, or by immersing them in its aqueous solution. A few drops in a saucer, or on a piece of spongy paper, if placed in a larder, will effectually drive away insects, and make the meat keep several days longer than it otherwise would. A small quantity added to brine or vinegar is commonly employed to impart a smoky flavour to meat and fish, and its solution in acetic acid is used to give the flavour of whiskey to malt spirit. See CARBOLIC ACID.

KRE'ATINE. $C_4H_9N_3O_2{\cdot}Aq$. *Syn.* CREATINE. A crystallisable substance obtained from the juice of the muscular fibre of animals. It was first observed by Chevreul, but has recently been carefully studied by Liebig.

(Liebig.) Lean flesh is reduced to
d then exhausted with successive
of cold water, employing pressure;
l liquid is heated to coagulate the
and colouring matter of the blood,
en strained through a cloth; pure
ter is next added as long as a pre-
orms, the liquid is filtered, and the
gently evaporated to the consistence
p; after repose for some days in a
ation, crystals of kreatine are de-
these are purified by redissolving
water, agitating the solution with
arcoal, and evaporating, &c., so that
ay form.

&c. Brilliant, colourless, prismatic
readily soluble in boiling water,
so in cold water and in alcohol; the
olution is neutral, bitter tasted, and
efies.

'ININE. $C_4H_7N_3O$. This substance
mall quantities, both in the juice of
in conjunction with kreatine in urine.
produced by the action of the stronger
reatine. It forms colourless prisma-
s, which are soluble in water, and the
as a strongly alkaline reaction. It
ful organic base, and produces crys-
salts with the acids.

IC ACID. See CRENIC ACID.

AL'LINE. The name originally ap-
Unverdorben to ANILINE.

TIEN'S METAL. *Prep.* Take of
iron, 3 parts; beat it to whiteness,
f antimony, 1 part; Molucca tin, 72
x under charcoal, and cool. *Used* to
and other metals with a surface of
lishes without a blue tint, is hard,
e advantage of being free from lead
ic.

'ZING. A method of preserving
cordage from decay, long known and
but patented by Mr. Kyan, a few
e. It consists in immersing the
n solution of corrosive sublimate, 1
water, 50 or 60 parts, either under
essure or the contrary, as the ur-
the case or the dimensions of the
erated on may require. See DRY

OL. A substance obtained from coal-
d at first thought to be an indepen-
iple, but since shown to be identical
INE.

RAQUE'S FLUID. See SOLUTION
IDE OF SODA.

NUM. *Syn.* LADANUM. An odo-
ous substance found on the leaves
s of the *Cystus creticus*, a plant
n the island of Candia and in Syria.
merly much used for making stimu-
sters. The following compound is
ed for it:—

um, Facti"tious. *Prep.* From gum
in, Venetian turpentine, and sand, of each 6 parts; Spanish juice and gum arabic, of each (dissolved in a little water), 3 parts; Canada balsam, 2 parts; ivory black, 1 part; balsam of Peru, q. s. to give a faint odour.

LA'BELS capable of resisting the action of OILS, SPIRITS, WATER, SYRUPS, and DILUTE ACIDS, may be obtained as follows:—Lay a coat of strained white of egg over the label (an ordinary paper one), and immediately put the vessel into the upper portion of a common steam-pan, or othewise expose it to a gentle heat till the albumen coagulates and turns opaque, then take it out and dry it before the fire, or in an oven, at a white heat of about 212° Fahr.; the opaque white film will then become hard and transparent. The labels on bottles containing STRONG ACIDS or ALKALINE SOLUTIONS should be either etched upon the glass by means of hydrofluoric acid, or be written with incorrodible ink. See ETCHING and INK.

LAB'ORATORY. *Syn.* LABORATORIUM, L. A place fitted up for the performance of experimental or manufacturing operations in chemistry, pharmacy, and pyrotechny. For full information respecting the best mode of fitting up a chemical laboratory, the reader is referred to works specially devoted to chemical manipulation.[1] Almost any well-lighted spare room may be fitted up as a small laboratory at very little expense. The gas-furnaces and improved lamps introduced of later years have to a certain extent rendered chemists independent of brick furnaces. A strong working bench, fitted with drawers and cupboards, and having gas-pipes at intervals for attaching different kinds of jets, is an indispensable fixture. A close cupboard or closet, which is connected by a pipe with the chimney or the external air, is required to receive vessels emitting corrosive or evil-smelling vapours; the door of this closet should be of glass. A sink, with a copious supply of water, must be at hand, for washing apparatus. A glass, a stoneware barrel, with a tap of the same material, is required for holding distilled water. Shelves, supports for apparatus, and drawers, should be provided in abundance. The fine balances and other delicate instruments should be kept in a separate apartment. With regard to apparatus, we may state that the articles most frequently required in a laboratory are the gas or alcohol lamps; iron pans for sand bath and water bath; evaporating dishes; precipitating jars, funnels, and wash-bottles; retorts, flasks, and test-tubes; mortars and pestles; retort- and filtering-stands; rat-tail and triangular files, and glass rod and tubing.

The principal philosophical - instrument-makers sell chests or cabinets filled with apparatus and chemicals, under the name of 'PORTABLE LABORATORIES.' Those sold by Mr. J. J. Griffin and by Messrs. Jackson and

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[1] The latest and best work is the "*Handbook of Chemical Manipulation*," by Greville Williams. Faraday's famous work on the same subject has long been out of print.

Townson are, perhaps, the most complete. They are well adapted for illustrating all the more valuable facts of chemical science, and performing all the ordinary operations of qualitative analysis.

LAC. *Syn.* LACCA, L. A resinous substance combined with much colouring matter, produced by the puncture of the female of a small insect, called the *Coccus lacca* or *ficus*, upon the young branches of several tropical trees, especially the *Ficus Indica*, *Ficus religiosa*, and *Croton lacciferum*. The crude resinous exudation constitutes the STICK-LAC of commerce. SHELL-LAC or SHELLAC is prepared by spreading the resin into thin plates after being melted and strained. SEED-LAC is the residue obtained after dissolving out most of the colouring matter contained in the resin.

Shell-lac is the kind most commonly employed in the arts. The palest is the best, and is known as 'orange lac.' The darker varieties —'liver-coloured,' 'ruby,' 'garnet,' &c.—respectively diminish in value in proportion to the depth of their colour.

Uses, &c. Lac was formerly much used in medicine; its action, if any, is probably that of a very mild diuretic. It is now chiefly used in DENTIFRICES, VARNISHES, LACQUERS, and SEALING-WAX.

Bleached Lac. *Syn.* WHITE LAC; LACCA ALBA, L. By dissolving lac in a boiling lye of pearlash or caustic potassa, filtering and passing chlorine through the solution until all the lac is precipitated; this is collected, well washed and pulled in hot water, and, finally, twisted into sticks, and thrown into cold water to harden. *Used* to make pale varnishes and the more delicate coloured sealing-wax.

LAC DYE. *Syn.* LAC, LAC-LAKE, INDIAN COCHINEAL. A colouring substance used to dye scarlet, imported from India.

Prep. By dissolving out the colour of ground stick-lac by means of a weak alkaline solution, and then precipitating it along with alumina by adding a solution of alum.

Obs. To prepare the lac for dyeing, it is ground and mixed with diluted 'lac spirit,' and the whole allowed to stand for about a week. The 'cloth' is first mordanted with a mixture of tartar and 'lac spirit,' and afterwards kept near the boil for three quarters of an hour, in a bath formed by adding a proportion of the prepared lac dye to the mixture used for mordanting. Lac dye is only applicable to woollen and silk. The colours it yields are similar to those obtained from cochineal, but less brilliant.

LAC SPIRIT. See TIN MORDANTS.

LAC'QUER. A solution of shell-lac in alcohol, tinged with saffron, annotta, aloes, or other colouring substances. It is applied to wood and metals to impart a golden colour. See VARNISH.

LACTALBU'MEN. See CASEIN.

LACTATE. *Syn.* LACTAS, L. A salt of lactic acid. The lactates are characterised by yielding an enormous quantity of perfectly pure carbonic oxide gas when heated with 5 or 6 parts of oil of vitriol. Most of these salts may be directly formed by dissolving the hydrate or carbonate of the metal in the dilute acid.

LACTA'TION. See INFANCY, NURSING, &c.

LACTIC ACID. $H_2C_6H_{10}O_6$. *Syn.* ACID OF MILK; ACIDUM LACTICUM, L. A sour, syrupy liquid, discovered by Scheele in whey. It is also found in some other animal fluids, and in several vegetable juices, especially in that of beet-root.

Prep. 1. Dissolve lactate of barium in water, precipitate the barium with dilute sulphuric acid, carefully avoiding excess, and gently evaporate to the consistence of a syrup, or until it acquires the density 1·215. Lactate of calcium may be used instead of lactate of barium, in which case a solution of oxalic acid must be employed as the precipitant. Pure. (See No. 5.)

2. Milk (skimmed or stale), 1 gal.; bicarbonate of sodium, ½ lb.; dissolve, and expose the liquid to the air for some days, until it becomes sour, then saturate the excess of acid with some more bicarbonate of sodium, and again expose it to the air; repeat this as often as the liquid becomes sour; next heat the liquid to the boiling-point, filter, evaporate to dryness (or nearly), and exhaust the residuum with rectified spirit; filter the alcoholic solution, which contains lactate of sodium, add sulphuric acid as long as it causes a precipitate to form, again filter, and concentrate the clear liquid by evaporation.

3. (Boutron and Fremy.) Milk, 3 or 4 quarts; sugar of milk, 200 to 300 grs.; mix, and expose for 2 or 3 days in an open vessel at 70° to 80° Fahr., then saturate with bicarbonate of sodium, again expose at a moderate temperature, saturate with more bicarbonate of sodium, and repeat the process until the whole of the sugar of milk is decomposed; then coagulate the casein by heat, filter, evaporate, extract the acid lactate of sodium by alcohol of sp. gr. ·810, and decompose it by the cautious addition of dilute sulphuric acid; again filter, distil off the alcohol, and evaporate as before.

4. (Scheele.) Evaporate sour whey to ⅛th of its bulk, saturate with slaked lime, filter, add 3 or 4 times the quantity of water, cautiously precipitate the lime with a solution of oxalic acid, filter, and gently evaporate to dryness in a warm bath; digest the residuum in strong rectified spirit, and again filter and evaporate.

5. (Wackenroder.) Sugar of lead, 25 parts; finely powdered chalk, 20 parts; skimmed milk, 100 parts; water, 200 parts; digested together at about 75° Fahr. In six weeks the chalk will be dissolved; the whole is then heated, but not to boiling; the cheese is strained off, pressed, and the decanted liquid is

ed by albumen and evaporated, to let the
e of calcium crystallise; the salt is re-
llised and decomposed, either by sul-
: acid or by the exact quantity of oxalic
This is, perhaps, the most effective mode
eparing lactic acid.

'Wholesale.)—*a.* Good raw cane-sugar,
is dissolved in milk (skimmed or stale),
s., and cheese (in a moist or putrescent
, ½ lb., and chalk, 4 lbs., previously
d to a cream with water, 1½ gal., is then
; the mixture is next exposed in a
r covered jar, at a temperature of 80° to
ihr., with occasional stirring, for 2 or 3
, or until the whole is converted into a
olid mass of crystals of lactate of calcium;
purified either by draining off and ex-
ng the liquid portion, dissolving the
e in water, and evaporating the solution
ystals; or the whole is put into a
rare vessel and heated to the boiling-
by which the casein is coagulated, and
ctate of calcium is dissolved; the solu-
iltered whilst hot, furnishes the salt in
ls on cooling; these crystals are sub-
ntly dissolved in water, and the filtered
n decomposed by oxalic acid, as before.
rom cane-sugar, 4 parts; moist cheese,
; chalk, 3 parts; water, 20 parts; as
it.

. Lactic acid prepared by any of the
formulæ may be rendered quite pure by
n with water, saturation with baryta,
ation, crystallisation, re-solution in
and the careful addition of dilute sul-
acid, as in No. 1; the liquid is, lastly,
filtered and evaporated. Another plan
onvert the acid into lactate of zinc, by
dition of commercial zinc-white, and to
lve the new salt in water, and then de-
se the solution with a stream of sul-
ted hydrogen. In all cases the evapora-
ould be conducted at a very gentle heat,
when possible, finished over sulphuric
or *in vacuo.* For particular purposes,
st product may be dissolved in ether,
l, and the ether removed by a very
heat. Care must also be taken to
the solid lactate of calcium at the
period from the fermenting liquid, as
ise it will gradually redissolve and dis-
, and on examination the liquid will be
to consist chiefly of a solution of buty-
calcium.

o. The product of the above formulæ
ution of lactic acid. It may be concen-
in vacuo over a surface of oil of vitriol
t appears as a syrupy liquid of sp. gr.
soluble in water, alcohol, and ether;
ing the usual acid properties, and form-
ts with the metals, called LACTATES.
. in a retort to 266° Fahr., a small por-
itils over, and the residuum on cooling
es into a yellowish, solid, fusible mass,
itter, and nearly insoluble in water.
cid, which has lost half (1 equiv.) of its basic water. By long boiling in water, this substance is reconverted into lactic acid. Heated to 480° Fahr., it suffers decomposition, lactide (the anhydrous, concrete, or sublimed lactic acid of former writers) and other products being formed. This new substance may be purified by pressure between bibulous paper and solution in boiling alcohol from which it separates in dazzling white crystals on cooling. By solution in hot water and evaporation to a syrup, it furnishes common lactic acid.

Uses. Lactic acid has been given in dyspepsia, gout, phosphatic urinary deposits, &c. From its being one of the natural constituents of the gastric juice, and from its power of dissolving a considerable quantity of phosphate of calcium, it appears very probable that it may prove beneficial in the above complaints. *Dose.* 1 to 5 grs.; in the form of lozenges, or solution in sweetened water.

LACTIC FERMENTATION. The peculiar change by which saccharine matter is converted into lactic acid. Nitrogenous substances which in an advanced state of putrefactive change act as alcohol-ferments often possess, at certain periods of their decay, the property of inducing an acid fermentation in sugar, by which that substance is changed into lactic acid. Thus, the nitrogenized matter of malt, when suffered to putrefy in water for a few days only, acquires the power of acidifying the sugar which accompanies it; whilst in a more advanced state of decomposition it converts, under similar circumstances, the sugar into alcohol. The gluten of grain behaves in the same manner. Wheat flour, made into a paste with water, and left for four or five days in a warm situation, becomes a true lactic acid ferment; but if left a day or two longer, it changes its character, and then acts like common yeast, occasioning the ordinary panary or vinous fermentation. Moist animal membranes, in a slightly decaying condition, often act energetically in developing lactic acid. The rennet employed in the manufacture of cheese furnishes a well-known example of this class of substances.

In preparing lactid acid from milk, the acid formed, after a time, coagulates and renders insoluble the casein, and the production of the acid ceases. By carefully neutralizing the free acid by carbonate of sodium, the casein becomes soluble, and, resuming its activity, changes a fresh quantity of sugar into lactic acid, which may be also neutralized, and by a sufficient number of repetitions of this process all the sugar of milk present may, in time, be acidified. This is the rationale of the common process by which lactic acid is obtained. Cane-sugar (probably by previously becoming grape-sugar) and the sugar of milk both yield lactic acid; the latter, however, most readily, the grape-sugar having a strong tendency towards the alcoholic fermentation. If the lactic fermentation be allowed to proceed too far, the second stage of the process of transmutation commences, hydrogen gas and carbonic acid gas are evolved, and the butyric fermentation, by which oily acids are formed, is established.

LAC'TIDE. See LACTIC ACID.

LAC'TIN. See SUGAR OF MILK.

LAC'TOMETER. *Syn.* GALACTOMETER. An instrument for ascertaining the quality of milk. The best way of testing milk is to place it in a long graduated tube or lactometer, and to allow it to remain until all the cream has separated, then to decant off the clear whey, and to take its specific gravity; the result of the two operations, when compared with the known quantity of cream and the density of the whey of an average sample of milk, gives the value of the sample tested.

A little instrument called a 'milk tester' is sold in London at a low price. It is essentially a hydrometer which sinks to a given mark on the stem in pure water, and floats at another mark at the opposite end of the scale in pure milk. The intermediate space indicates the quantity of water (if any) employed to adulterate the article. As the sp. gr. of pure milk varies, the indications of the 'tester' cannot be depended on.

LAC'TUCA. (B.P.) *Syn.* LETTUCE. The leaves and flowering tops of the wild indigenous plant *Lactuca Virosa.* They are sedative, narcotic, and powefully diuretic; also mildly laxative and diaphoretic. Given in dropsy and visceral obstructions. See LETTUCE, EXTRACT OF.

LAC'TOSE. See SUGAR OF MILK.

LACTUCA''RIUM. *Syn.* LETTUCE OPIUM, THRIDACE; LACTUCARIUM (Ph. E. & D.). The inspissated milky juice of the *Lactuca sativa* (common garden lettuce), or the *Lactuca virosa* (strong scented wild lettuce), obtained, by incision, from the flowering stems, and dried in the air. The latter species yields by far the greater quantity. M. Arnaud, of Nancy, adopts the following method of procuring this substance, which appears to be the most productive and simple of any yet published:—Before the development of the lateral branches, the stems of twelve plants are cut, one after another, a little below the commencement of these branches; returning to the first one, a milky exudation is found on the cut portion, and on that which remains fixed in the earth; this milky exudation is adroitly collected with the end of the finger (or with a bone knife), which is afterwards scraped on the edge of a small glass; the same operation is performed on twelve other heads, and so on; on the third day it is repeated on every portion of the plant remaining in the ground, a thin slice being first cut off the top; this is done every day until the root is reached. As soon as the lactucarium is collected, it coagulates; the harvest of each day is divided into small pieces, which are placed on plates, very near each other, but without touching, and allowed to dry for two days, after which they are set aside in a bottle. In this way 15 or 20 times the ordinary product is obtained.

Prop., &c. Lactucarium is anodyne, hypnotic, antispasmodic, and sedative, allaying pain and diminishing the force of the circulation. It has been recommended in cases in which opium is inadmissible, and has been administered with advantage in chronic rheumatism, cholic, diarrhœa, asthma, and troublesome cough of phthisis, the irritability and watchfulness in febrile disorders, &c.—*Dose.* 2 to 5 grs.; made into pills, lozenges, or tincture.

LACTU'CIN. *Syn.* LACTUCINUM, L. This is the active principle of lactucarium, and is found in the juice of several species of lettuce.

Prep. Exhaust lactucarium with hot rectified spirit, agitate the tincture with a little animal charcoal, filter, add a little milk of lime, and evaporate to dryness; digest the residuum in hot rectified spirit, filter, and evaporate by a gentle heat, so that crystals may form.

Prop., &c. A nearly colourless, odourless, fusible, neutral, bitter substance; sparingly soluble in cold water and in ether; but freely soluble in alcohol. It possesses feeble basic properties. Good lactucarium contains fully 20% of this substance.

LAD'ANUM. See LABDANUM.

LAENNEC'S CONTRA-STIMULANT. See DRAUGHT.

LAKE. *Syn.* LACCA, L. Animal or vegetable colouring matter, precipitated in combination with oxide of tin or alumina; usually the latter. The term was formerly restricted to red preparations of this kind, but is now indiscriminately applied to all compounds of alumina and colouring matter. The term 'LAKE,' when unqualified by an adjective, is, however, understood to apply exclusively to that prepared from cochineal.

Prep. Lakes are made—1. By adding a solution of alum, either alone or partly saturated with carbonate of potassa, to a filtered infusion or decoction of the colouring substance, and after agitation precipitating the mixture with a solution of carbonate of potash.—2. By precipitating a decoction or infusion of the colouring substance made with a weak alkaline lye, by adding a solution of alum.—3. By agitating recently precipitated alumina with a solution of the colouring matter, prepared as before, until the liquid in nearly decoloured, or the alumina acquires a sufficiently dark tint. The first method is usually employed for acidulous solutions of colouring matter, or for those whose tint is injured by alkalies; the second, for those that are brightened, or at least uninjured, by alkalies; the third, for those colouring matters that have a great affinity for gelatinous alumina, and readily combine with it by mere agitation. By attention to these general rules, lakes may be prepared from almost all animal and vegetable colouring substances that yield their colour

[illegible]

Lake, Brazil-wood. *Syn.* Brazil-wood lake, Lacca in globulis, L. *Prep.* 1. Take of ground Brazil wood, 1 lb.; water, 4 gallons; digest for 24 hours, then boil for 15 minutes, and add of alum 1½ lb., dissolved in a little water; mix, decant, strain, and add of solution of tin, ½ lb.; again mix well and filter; to the clear liquid add, cautiously, a solution of salt of tartar or carbonate of soda, as long as a deep-coloured precipitate forms, carefully avoiding excess; collect, wash, dry, &c., as directed above.

Obs. The product is deep red. By collecting the precipitate in separate portions, lakes varying in richness and depth of colour may be obtained. The first portion of the precipitated lake has the brightest colour. An excess of alkali turns it on the violet, and the addition of cream of tartar, on the brownish red. The last turns more on the violet red when the solution of tin is omitted. Some persons use less, others more, alum.

[illegible]

Lake, Cochineal. [illegible]

2. [illegible]

3. Cochineal, powdered, [illegible] water, 2 gallons; boil 1 hour, decant, strain, add a solution of salt of tartar, 1 lb., and precipitate with a solution of alum. By adding the alum first, and precipitating the lake with the alkali, the colour will be slightly varied. All the above are sold as CARMINATED or FLORENCE LAKE, to which they are often superior.

Lake, Green. Made by mixing blue and yellow lake together. Seldom kept in the shops, being generally prepared extemporaneously by the artist on his palette.

Lake, Lac. *Prep.* Boil fresh stick-lac in a solution of carbonate of soda, filter the solution, precipitate with a solution of alum, and proceed as before. A fine red.

Lake, Li′chen. See ORCEIN.

Lake, Mad′der. *Syn.* LACCA RUBIÆ, L. CO-

LUMBINA, L. *Prep.* 1. (Sir H. C. Inglefield.) Take of Dutch grappe or crop madder, 2 oz.; tie it in a cloth, beat it well in a pint of water in a stone mortar, and repeat the process with fresh water (about 5 pints) until it ceases to yield colour; next boil the mixed liquor in an earthen vessel, pour it into a large basin, and add of alum 1 oz., previously dissolved in boiling water, 1 pint; stir well, and while stirring, pour in gradually of a strong solution of carbonate of potassa ('oil of tartar'), 1¼ oz.; let the whole stand until cold, then pour off the supernatant yellow liquor, drain, agitate the residue with boiling water, 1 quart (in separate portions), decant, drain, and dry. *Product.* ½ oz. The Society of Arts voted their gold medal to the author of the above formula.

2. Add a little solution of acetate of lead to a decoction of madder, to throw down the brown colouring matter, filter, add a solution of tin or alum, precipitate with a solution of carbonate of soda or of potassa, and otherwise proceed as before.

3. (Ure.) Ground madder, 2 lbs.; water, 1 gal.; macerate with agitation for 10 minutes, strain off the water, and press the remainder quite dry; repeat the process a second and a third time; then add to the mixed liquors, alnm, ¼ lb., dissolved in water, 3 quarts; and heat in a water bath for 3 or 4 hours, adding water as it evaporates; next filter, first through flannel, and, when sufficiently cold, through paper; then add a solution of carbonate of potassa as long as a precipitate falls, which must be washed until the water comes off colourless, and, lastly, dried. If the alkali be added in 3 successive doses, 3 different lakes will be obtained, successively diminishing in beauty. See MADDER, MADDER RED, &c.

Or'ange Lac. *Prep.* Take of the best Spanish annotta, 4 oz.; pearlash, ¾ lb.; water, 1 gall,; boil for half an hour, strain, precipitate with alum, 1 lb., dissolved in water, 1 gall., observing not to add the latter solution when it ceases to produce an effervescence or a precipitate; strain, and dry the sediment in small squares, lozenges, or drops. The addition of some solution of tin turns this lake on the LEMON YELLOW; acids redden it. See YELLOW LAKE.

Lake, Red. *Prep.* Take of pearlash, 1 lb.; clean shreds of scarlet cloth, 3¼ lbs.; water, 5 galls.; boil till the cloth is decoloured, filter the decoction, and precipitate with a solution of alum, as before. See the LAKES noticed above (Brazil-wood, Carminated, Cochineal, and Madder).

Lake, Yellow. *Prep.* 1. Boil French berries, quercitron bark, or turmeric, 1 lb., and salt of tartar, 1 oz., in water, 1 gal., until reduced to one half, then strain the decoction, and precipitate with a solution of alum.

2. Boil 1 lb. of the dye-stuff with alum, ½ lb.; water, I gal., as before, and precipitate the decoction with a solution of carbonate of potash. See LAKE, ORANGE (*above*).

LAMB in its general qualities closely resembles mutton, of which, indeed, it is merely a younger and more delicate kind. It is well adapted as an occasional article of food for the convalescent and dyspeptic; but it is unequal for frequent use, more especially for the healthy and robust, to the flesh of the adult animal.

LAMBS, DISEASE OF. Among other diseases, these animals are particularly prone to one affecting the lungs in consequence of the existence of parasites (*Strongylus bronchialis*) in the air-passages. See PARASITES.

LAMP. A contrivance for producing artificial light or heat by the combustion of inflammable liquids. The term 'lamp' is also applied to a portable gas-burner (GAS-LAMP), and to a tubular candle-holder, which, by the aid of a simple mechanical device, keeps the flame at one height (CANDLE-LAMP).

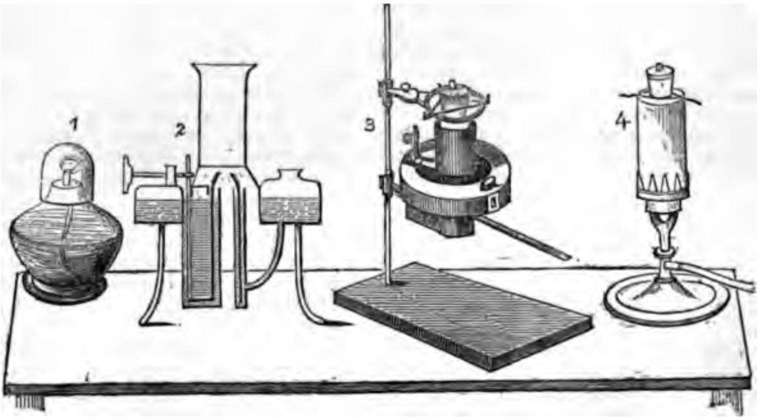
OIL LAMPS were employed for illumination among the nations of antiquity, at the earliest period of which any record exists. The Assyrian, Greek, and Roman lamps preserved in our museums are generally noble specimens of art-workmanship. Though elegant in form, and rich in external embellishment, the ancient lamp was simply a vessel to contain the oil, with a short depression or spout on the one side, in which the wick is laid. Lamps of this rude construction are still in common use in many countries.

No important improvement in the principle and construction of lamps as a source of light occurred until a comparatively recent date; the smoke, dirt, and disagreeable odour of the common lamp having previously led to its disuse among the superior classes in favour of candles. At length, in 1789, M. Argand made a revolution in illumination by the invention and introduction of the well-known lamp which bears his name. In the ARGAND LAMP a hollow tubular wick of woven cotton replaces the solid bundle of fibres, and is so arranged that air passes through it into the interior of the flame. Over the burner is placed a cylindrical glass chimney, open at the bottom, and surrounding the flame at a short distance from it, by which another current of air is made to act on the exterior portion of the flame. In this way a due supply of oxygen is secured, and sufficient heat generated for the perfect combustion of the gaseous products of the oil, and the smoke and soot which escape from the ordinary lamp are converted into a brilliant and smokeless flame.

The earliest table-lamps constructed on Argand's principle had one serious defect—the oil vessels had to be placed almost on a level with the burners, in a position which caused them to cast objectionable shadows. This defect was almost entirely removed by making the oil vessel in the form of a flattish ring, connected by slender tubes with the ner. The more elegant contrivances, known he MODERATOR LAMP and CARCEL LAMP, ch are now so much used for burning colza similar oils, cast no shadow. In these the instead of being sucked up by the wick, lescending to it by the force of gravity, is ven up by mechanical means from the oil-rvoir contained in the foot or pedestal. A al spring, acting upon a piston, elevates oil in the 'moderator,' while a little pump ked by clockwork does the same duty in 'Carcel.' The burner and wick in each formed on Argand's principle.

or burning the hydrocarbon oils distilled n coal and petroleum, lamps of very simple struction are used. These oils, in consence of their diffusive character, rise to a considerable height up a wick, and therefore do not require mechanical lamps. The wicks of HYDRO-CARBON LAMPS are usually flat, but sometimes circular. To cause perfect combustion, a strong draught of air is created by placing over the flame a tall glass chimney, usually much contracted above the flame. A metallic cap, with an orifice the shape of the flame, is placed over the burner, its use being to deflect the currents of air upon the flame. The reservoirs of hydro-carbon lamps ought always to be constructed of some bad conductor of heat, as glass or porcelain.

For chemical operations, many forms of lamp are used. The ordinary glass SPIRIT-LAMP, fitted with a ground-glass cap, is quite indispensable for minor experiments. (See *engr.* 1.)



neware wick-holders are preferable to those brass, which become greatly heated, and anger the splitting of the glass. "An ctive spirit-lamp may at any time be conicted out of a vial having a glass tube sing through the cork, a cover being formed n a test-tube inverted over the wick, and ing with moderate tightness on the suior extremity of the cork," (Greville Wilns.) Alcohol or wood spirit is the fuel d.

he ARGAND LAMP, when intended as a rce of heat for chemical purposes, is so lified as to adapt it to burn either oil, it of wine, or wood-spirit, and the comtion is greatly aided by the chimney, which his case is made of copper. (See *engr.* 2 and The lamp itself is also made of metal, furnished with ground caps to the wickler and aperture by which the spirit is oduced, in order to prevent loss of spirit evaporation when the lamp is not in use. en in use this aperture must always be left n, otherwise an accident is sure to happen, he heat expands the air in the lamp, and spirit is forcibly expelled.

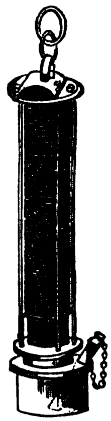
n those situations in which coal-gas is cheap, it may be used with great economy and advantage as a course of heat in most chemical operations. Retorts, flasks, capsules, and other vessels, can be thus exposed to an easily regulated and constant temperature for many successive hours. Small platinum crucibles may be ignited to redness by placing them over the flame on a little wire triangle. Of the various gas-lamps now used in the laboratory, the first and most simple consists of a common Argand gas-burner fixed on a heavy and low foot, and connected with a flexible gas-tube of caoutchouc or other material. (See *engr.* 4.) With this arrangement it is possible to obtain any degree of heat, from that of the smallest blue flame, to that which is sufficient to raise a moderately large platinum crucible to dull redness. When gas mixed with a certain proportion of air is burnt, a pale blue flame, free from smoke, and possessing great heating power, is obtained. A lamp for burning the mixture may easily be made by fitting a close cover of fine wire gauze over the top of the chimney of the last-mentioned contrivance. The gas is turned on, and after a few minutes ignited above the wire gauze. The ingenious and useful burners of

Bunsen and Griffin are so constructed that gas and air mixed in any proportions, or gas alone, may be burnt at pleasure. See Illumination, Fuel, Furnace, Gas, Laboratory, &c.

Flame'less Lamp. *Syn.* Glow lamp. A coil of fine platinum wire is slipped over the wick of a spirit lamp, the greater part being raised above the cotton; the lamp is supplied with ether or alcohol, lighted for a moment, and then blown out. The coil continues to glow in the mixed atmosphere of air and combustible vapour, until the liquid in the lamp is exhausted.

Monochromat'ic Lamp. A lamp fed with a mixture of a solution of common salt and spirit of wine. It gives a yellow light, and makes every object illuminated by it appear either yellow or black. The human features are changed in a remarkable degree; the countenance appearing truly ghastly and unearthly.

Safe'ty Lamp. *Syn.* Miner's lamp, Davy, Geordy. The safety lamp of Sir H. Davy and George Stephenson are similar in principle, and were independently invented about the same time. That of Sir H. Davy consists of a common oil lamp, surmounted with a cylinder of wire gauze, the apertures of which are not greater than the $\frac{1}{20}$th of an inch square, and the wire of which it is made of the $\frac{1}{40}$th to the $\frac{1}{60}$th of an inch in diameter. (See *engr.*) The fire-damp (carbonetted hydrogen) along with air passes through the meshes into the interior of the gauze cylinder. Here it ignites, but the flame which is produced by its combustion cannot explode a mixture of fire-damp and air by which the lamp may be surrounded. The flame is prevented from passing to the exterior of the gauze by the cooling action of the metal of which it is constructed. When this lamp is taken in to an explosive atmosphere, although the fire-damp may burn within the cage with such energy as sometimes to heat the metallic tissue to dull redness, the flame is not communicated to the mixture on the outside. These appearances are so remarkable, that the lamp becomes an admirable indicator of the state of the air in different parts of the mine, and if its admonitions are attended to, gives the miner time to withdraw before an explosion takes place.



Telescope Lamp. This ingenious contrivance, invented by Messrs. Murray and Heath, is intended for microscopic illumination. It consists of three brass tubes sliding one within the other, the oil vessel being contained in the inner tube. The height of the lamp is regulated to the greatest nicety by simply turning one tube in the other, interior spiral guides preventing all chance of slipping. The great advantages of this arrangement is absence of the stand and bar usually employed for raising and lowering the lamp, which enables it to be used on all sides, and to be brought much closer to the microscope than other lamps. See *Engr.*, p. 680.

LAMP BLACK. See Black Pigments.

LAMP'REY. *Syn.* Great lamprey, Seal. This fish is the *Petromyzon marinus* of Linnæus. It generally quits the sea in the spring, for the purpose of spawning, and remains in our rivers for a few months. Its flesh is soft and glutinous, and though esteemed a delicacy, is extremely difficult of digestion, if not otherwise unwholesome. Potted lampreys are usually so highly seasoned, as to become a dangerous article of food. Henry I is said to have lost his life from the effects of a surfeit of lampreys.

LANTHA'NIUM. La. A rare metal, discovered by Mosander, associated with oxide of cerium. Oxide of lanthanium is a pale salmon-coloured powder, unaffected by ignition in open vessels. See Cerium.

LA'PIS. [L.] A stone. The term was much employed by the old chemists, and is still commonly applied to several preparations used in medicine.

Lapis Caus'ticus. See Potassa.

Lapis Divi'nus. *Syn.* Divine stone; Lapis ophthalmicus, L.; Pierre divine, Fr. *Prep.* 1. (Beer.) Verdigris, nitre, and alum, equal parts, melted together.

2. (P. Cod.) Alum, nitre, and blue vitriol, of each 3 oz.; camphor, 1 dr.; as last.

3. (Woolfuss.) Blue vitriol, nitre, alum, and camphor, equal parts, melted together, adding the camphor last. Astringent and detergent. 1 oz., dissolved in water, 1 pint, formed a once celebrated lotion. 1 dr. in water, 1 pint, is still used as a collyrium.

Lapis Inferna'lis. See Nitrate of Silver.

Lapis Lazu'li. See Ultramarine.

Lapis Lydius. *Syn.* Lydian stone. A siliceous slate, used as a touchstone by jewellers.

Lapis Medicamento'sus. *Syn.* Medicinal stone; Lapis mirabilis, L. *Prep.* (Ph. L. 1746.) Alum, litharge, and Armenian bole, of each, 6 oz.; colcothar of green vitriol, 3 oz.; vinegar, 4 fl. oz.; mix. and evaporate to dryness. Formerly used to make an astringent and detergent lotion:—1 oz. to water, 1 pint. Once a popular application to ulcers, and in other cases; now disused.

Lapis Vulnerar'ius. Very similar to Lapis Divinus.

LARD. *Syn.* Hog's lard, axunge; Adeps (Ph. L.), Axungia (Ph. E.), A. suillus (Ph. D.), A. porci, A. præparatus, (B.P.), L. The fat of the pig (*Sus scrofa*—Linn.) melted by a gentle heat, and strained through flannel or a hair sieve. The fat about the loins yields the whitest and hardest lard. "That which has been cured with chloride of sodium is not to be employed." (Ph. L.) "It is not to be used without being first carefully washed with

(Ph. L. 1866.) *Used*, chiefly, to make
s, and in cookery. See **Adeps.**

ING. By many this is regarded as
g to the higher style of cookery only,
troublesome and extravagant to be
to the kitchens of the middle classes
poor. This, we are assured, is not the
On the contrary, "it is an economical
and will make lean meat go much
han without it." The process of lard-
follows:—"Get what is called a lard-
lle, that is, a piece of steel from 6
ches long, pointed at one end, and having four slits at the other to hold a small strip of bacon when put between them. It will, perhaps, cost tenpence. Cut the bacon into pieces 2 or 3 inches long, and ¼ to ⅛ an inch square; put each one after the other in the pin, insert it in the meat, and leave only about half an inch out; using 8 pieces to each pound." (Soyer.)

LARK. The *Alauda arvensis* (SKYLARK) and the *Alauda cristata* (FIELD-LARK), with several other species of the same genus, form a light and nutritious article of food, by many esteemed a delicacy. The last, according to
nd Dioscorides, eaten either roasted or
helps the colic.' The heart, applied to
gh, was also regarded to possess the
rtue.

)A'NUM. This name is now under-
o denote, exclusively, the common
of opium of the Pharmacopœia; but
y the term was applied to several pre-
s of opium differing greatly from each
oth in their strength and mode of pre-
. (See *below*.)

num, Dutchman's. From the flowers
hoof or Dutchman's laudanum (*Passi-
rucuja*—Linn.) infused in rum. Narcotic. *Used* as a substitute for tincture of opium in the West Indies.

Laudanum, Ford's. This is merely the common tincture of opium aromatized with a little cloves and cinnamon.

Laudanum, Houlton's. *Prep.* From opium 2½ oz.; distilled vinegar, 1½ pint; digested together for a week, the filtered tincture gently evaporated nearly to dryness, and then redissolved in weak spirit (1 of rectified spirit to 7 of water), 1 quart.—*Dose* 10 to 60 drops.

Laudanum, Neumann's. A fermented infusion of opium evaporated to the consistence of honey.

Laudanum, Quince. *Syn.* EXTRACTUM OPII CYDONIATUM, LAUDANUM CYDONIATUM, L. *Prep.* 1. Extract of opium made with quince juice; a few drops of the oils of cinnamon, cloves, and mace, being added before the mass cools. Now seldom used.

2. LAUDANUM LIQUID-QUINCE; LAUDANUM LIQUIDUM CYDONIATUM, L. L. C. PARATUM FERMENTATIONE, L.) A fermented infusion of opium prepared with quince juice, aromatized with cloves, cinnamon, aloes wood, and yellow sandal wood, and evaporated so as to possess about twice the strength of the ordinary tincture. Now obsolete.

Laudanum, Rousseau's. Wine of opium prepared by fermentation. See WINE.

Laudanum, Smith's Concentrated. Resembles Battley's LIQUOR OPII SEDATIVUS, but possesses about 6 times its strength.

Laudanum, Swediaur's. *Prep.* From extract of opium, 2 parts, dissolved in a mixture of alcohol, 1 part, distilled water, 8 parts. Every 5 drops contain 1 gr. of opium.

Laudanum, Sydenham's Liquid. *Syn.* LAUDANUM LIQUIDUM SYDENHAMI, L. Similar to WINE OF OPIUM—Ph. L., but rather stronger, and aromatized with a little cloves and cinnamon. Wine of opium is now always sold for it.

Laudanum, Tartarized. *Syn.* LAUDANUM LIQUIDUM TARTARIZATUM, L. A tincture of opium prepared with spirit alkalized with salt of tartar, and flavoured with aromatics. Obsolete.

LAUGH'ING GAS. See NITROUS OXIDE.

LAUR'EL. See CHERRY LAUREL, SWEET BAY, OIL, &c.

LA'VA. The matter thrown out by volcanoes, The beautiful ornamental vases, jugs, and other objects sold under the name, are a superior sort of unglazed coloured porcelain.

LAVE'MENT. See ENEMA.

LAV'ENDER. The flowers or flowering tops of *Lavandula vera* or common garden lavender. An essential oil, spirit, and tincture, prepared from it, are officinal in the Pharmacopœias.

Lavender, Red. See TINCTURE.

Lavender, Smith's British. *Prep.* From English oil of lavender, 2 oz.; essence of ambergris, 1 oz.; eau de Cologne, 1 pint; rectified spirit, 1 quart. Very fragrant. See WATER (Lavender.)

LAX'ATIVES. *Syn.* LENITIVES; LAXATIVA, LAXANTIA, LENITIVA, L. Mild purgatives or cathartics. The principal of these are—almond oil, cassia pulp, castor oil, confection of senna, cream of tartar, figs, grapes, honey, phosphate of soda, prunes, salad oil, tamarinds, &c.

LAY'ERS. Among gardeners, a mode of propagating plants, by laying down the shoots of young twigs, and covering a portion of them with the soil, without detaching them from the parent plant. To facilitate the rooting of such layers, the part beneath the soil is fractured by twisting or bruising it, or it is partly cut through with a sharp knife, immediately under a bud. When the layer has taken root, it is divided from the parent stem, and transplanted or potted. In this way with a little care, nearly all plants may be multiplied.

LEAD. Pb. Eq. 207. *Syn.* PLUMBUM. This metal, like gold, silver, and iron, appears to have been known in the most remote ages of antiquity. The ore from which it is almost exclusively extracted, as being the only one found in abundance, is the native sulphide or sulphuret of lead, called by mineralogists galena.

Prep. On the large scale lead is obtained by roasting galena in a reverberatory furnace, and smelting the residue along with coal and lime. The lead thus obtained generally contains small quantities of both silver and gold, which it often pays to extract, by a method termed 'Pattinson's process.' This process is founded on the circumstance that when melted, lead containing silver is allowed to cool. The lead crystallises out first, leaving an alloy of lead and silver still fused. By removing the crystals of lead, as formed, until about four fifths are removed; the residue is an alloy of lead and silver much richer than the original. Repeated several times, this yields a rich alloy of silver and lead that is expelled and the silver obtained.

Pure lead for chemical purposes may be obtained as follows, although the lead of commerce is nearly pure:

By reducing nitrate of lead with charcoal.

By heating the oxide left by igniting pure acetate of lead with black flux.

Prop., &c. The general properties of lead are too well known to require notice here. The sp. gr. of that of commerce is about 11·35; but in a state of absolute purity its greatest density is 11·45. It melts at about 600° Fahr., and when very slowly cooled, crystallises in octahedrons. At a white heat it boils, and is volatilised. When exposed to moist air, it soon becomes covered with a gray film. It is scarcely acted on by hydrochloric or sulphuric acids, although, after some time, both coat it with a film of chloride or sulphate. It is rapidly acted on by nitric acid, with formation of the nitrate. Pure water, put into a leaden vessel, and exposed to the air, soon corrodes it, and dissolves the newly formed oxide; but river and spring water have little action upon lead, provided there is no free carbonic acid present, the carbonates and sulphates in such waters destroying their solvent powers. It has been found that a very small amount of phosphate of sodium or of iodide of potassium, dissolved in distilled water prevents its corrosive action on this metal. The lead in contact with such water gradually becomes covered with a superficial film of an insoluble salt of lead, which adheres tenaciously, and prevents further change. From this it appears that ordinary water ('hard water'), which abounds in mineral salts, may be more or less safely kept in leaden cisterns; but distilled water and rain water, and all other varieties that contain scarcely any saline matter, speedily rode, and dissolve a portion of lead, when t in vessels of that metal. When, how- r, leaden cisterns have iron or zinc fasten- s or braces, a galvanic action is set up, the servative power of saline matter ceases, and water speedily becomes contaminated with l, and unfit for consumption as a beverage. ter containing carbonic anhydride also acts lead; and this is the reason why the water ome springs (although loaded with saline tter), when kept in leaden cisterns, or raised leaden pumps, possesses unwholesome pro- ties.

ree carbonic acid is evolved during the nentation or decay of vegetable matter, l hence the absolute necessity of preventing leaves of trees falling into water-cisterns med of lead. The 'eau de rose' and the u d'orange' of commerce, which are pure illed water holding in solution small quan- es of essential oil, and are imported in len canisters, always contain a small quan- y of lead, and deposit a sediment, which is the case when they are kept in glass or orrodible vessels.

ead and all its preparations are highly sonous; and whether imbibed in almost nitesimal quantities with our daily bever- s and food, or swallowed in larger and ap- ciable doses, is productive of the most dis- rous consequences, the real cause being fortunately seldom suspected.

With the acids lead or its oxides form salts, ally white in colour, and in the majority rly insoluble in water, but readily soluble acids.

Tests. The oxides and salts of lead, mixed h a little carbonate of soda, and exposed a charcoal support to the reducing flame of blowpipe, readily yield a soft and ductile bule of metallic lead, and the charcoal, at same time, becomes covered with a yel- wish incrustation of oxide of lead. Both tallic lead and its oxides are soluble in ric acid, furnishing a solution which may examined with ease.

Selection of lead salts may be recognised by following reactions:—Sulphuretted hy- gen, hydrosulphide of ammonium, and the aline sulphides, give black precipitates, in- uble in the cold dilute acids, alkalies, alka- e sulphides, and cyanide of potassium. tassium and sodium hydrates give a white ecipitate, soluble in excess. Ammonia (ex- pt with the acetate) gives a white precipi- e, insoluble in excess. The carbonates of tassium, sodium, and ammonium, give a ite precipitate, insoluble in excess. Dilute lphuric acid (in excess), and solutions of the lphates give a white precipitate, sparingly uble in dilute acids, but soluble in a hot iling solution of potassium carbonate. Chro- ite and bichromate of potassium give yellow ecipitates insoluble in dilute nitric acid, and uble in solution of potassium hydrate. lide of potassium gives a yellow precipitate, soluble in great excess by heat, and separating in small, brilliant, golden-yellow scales, as the liquid cools. A piece of polished zinc precipitates metallic lead in an arborescent form, hence called the lead tree. To prepare for these tests, a solid supposed to contain lead should be digested in nitric acid, when the solution, evaporated to dryness and redissolved in water, may be tested as above.

Estim. This has been already referred to under previous heads. The ores of lead (galena) may be digested in nitric acid, when the solution may be treated with sulphuric acid, and the lead estimated from the weight of the precipitated sulphate. This is called an assay in the wet way. The method adopted by practical mineralogists is an assay in the dry way, and is conducted as follows:—A small but powerful air-furnace, charged with coke, is brought to as high a temperature as possible, and a conical wrought-iron crucible plunged into the midst of it; as soon as the crucible has attained a dull-red heat, 1000 grs. of the galena, reduced to powder, are thrown into it, and stirred gently with a long piece of stiff iron wire flattened at the one end, in order to expose as large a surface of the powdered ore to the air as possible, observing now and then to withdraw the wire, to prevent it becoming red-hot, in which case some of the ore would permanently adhere to it, and be reduced before the intended time; the roasting is completed in 3 or 4 minutes, and any portion of the ore adhering to the stirrer being detached by a knife, and returned into the crucible, the latter is covered up, and allowed to attain a full cherry-red heat, when about 2 or 3 spoonfuls of reducing flux are added, and the whole brought to a full white heat; in 12 to 15 minutes, the portion of metal and scoria adhering to the sides of the crucible are scraped down into the melted mass with a small stick of moist green wood, after which the crucible is again covered, and the heat urged for 2 or 3 minutes longer, so as to keep the mass in a perfectly liquid state during the whole time; the crucible is then removed from the fire with the crucible-tongs, and adroitly tilted so as to discharge its contents into a small ingot-mould of brass, observing to rake the scoria from the surface to the sides of the crucible, so as to allow the molten lead to be poured out without it; the scoria is then reheated in the crucible with about ½ spoonful of flux, and after being cleansed with a piece of green wood, as before, is at once poured into a second mould, which is instantly inverted; the little button of lead thus obtained is added to the lead in the other mould, and the whole is accurately weighed. The weight, divided by 10, gives the percentage of lead (including silver, if present) in the ore examined.

One half of the lead thus obtained is put into a dry cupel of bone ash, and placed in the cupelling furnace, and treated as described in the article on assaying; the metallic button left on the cupel is then detached and weighed. The weight, divided by 5, gives the per-centage of pure silver.

Obs. The flux commonly employed in the above assay is composed of red argol, 6 parts; nitre, 4 parts; borax, 2 parts; fluor spar, 1 part; well pulverised and thoroughly mixed together. When the ore is very refractory, about a spoonful of carbonate of potassium should be added for each 1000 grains of ore, in which case the roasting may be dispensed with. The quantity of silver in argentiferous galena varies from $\frac{3}{10000}$ to $\frac{1}{3}$ part of the whole. Whenever this ore contains above 2 parts of silver in the 1000, it is found to be profitable to extract the latter. Indeed, by Pattison's process it is found that as small a proportion as 1 in 8000 can be extracted with profit.

Uses. The uses of lead in the arts are well known. It enters into the composition of many important alloys (pewter, type-metal, shot-metal, solder, &c.), it furnishes us with several valuable pigments (chrome yellow, &c.), and it is extensively used in dyeing. Some of its preparations are employed in medicine.

Ant., &c. Administer an emetic of sulphate of zinc or sulphate of copper, and, if necessary, tickle the fauces with the finger or a feather, to induce vomiting. Should this not succeed, the stomach-pump may be had recourse to. Epsom or Glauber's salts, or alum, dissolved in water, or water acidulated with sulphuric acid, followed by tea, water gruel, or barley water, are the proper antidotes, and should be taken as soon after the poison has been swallowed as possible. In poisoning by white lead, Dr. Alfred Taylor recommends the administration of a mixture of sulphate of magnesium and vinegar, as preferable to the sulphate alone. When the symptoms are those of painter's colic, the treatment recommended under that head should be adopted. In paralysis arising from lead, small doses of strychnine, brucine, and their preparations, may be cautiously administered. A symptom of poisoning by lead is the formation of a narrow leaden blue line, from $\frac{1}{30}$th to $\frac{1}{8}$th of an inch wide, bordering the edges of the gums, attached to the neck of two or more teeth of either jaw. (Dr. Burton.) This decoloration may often be detectod or rendered more conspicuous by rinsing the mouth out with water holding a little sulphuretted hydrogen or hydrosulphide of ammonium in solution. Chevallier and Rayer recommend the use of sulphurous or hepatic mineral waters, or of artificial solutions of sulphuretted hydrogen or alkaline sulphides in water, both in cases of acute and chronic poisoning by lead; but the practical success of this plan does not appear to have been in proportion to theoretical anticipations. The hydrated sulphides of iron are said by their advocates to be infallible, if taken sufficiently early.

Lead, Acetate of. $Pb(C_2H_3O_2)_2$. *Syn.* PLUMBIC ACETATE, SUGAR OF LEAD, PLUMBI ACETAS. (B. P.) *Prep.* Lithage (in fine powder) 24; acetic acid, 40; distilled water, 20; mix the acetic acid and the water, add the litharge, and dissolve with the aid of a gentle heat, filter, evaporate until a pellicle forms and crystallise. Drain and dry the crystal.

Acetic acid (sp. gr. 1·0843), 23 parts, is gently heated in a copper boiler rendered electro-negative by means of a large flat piece of lead soldered within it, and litharge (pure, and in fine powder), 13 parts, is sprinkled in; the heat is then continued, with constant stirring, until the acid is saturated, when the mother-waters of a former process, if any, are added, and the whole is heated to the boiling-point, and allowed to settle until cold; the clear portion is now decanted, and evaporated in a similar vessel until the liquor has the sp. gr. 1·266 or 1·267, when it is run into salt-glazed stoneware vessels (the edges of which have been well smeared with candle grease), and allowed to crystallise. The product is 38 to 38½ parts of crystallised sugar of lead. It is found to be advantageous to preserve a very slight excess of acid during the boiling and crystallisation, to prevent the formation of any basic acetate, the presence of which impedes the formation of regular crystals.

From litharge, 112 lb.; acetic acid (sp. gr. 1·057), 128 lb. *Prop.* 180 to 184 lb.

Prop. Pure acetate of lead forms colourless, transparent, prismatic crystals, slightly efflorescent in dry air; it is soluble in 8 parts of alcohol and in 1¼ part of cold water; the aqueons solution has a sweet astringent taste, and feebly reddens litmus, but turns turmeric and the juice of violets green; when gently heated, it melts in its water of crystallisation; by continuing the heat, the whole of the water is expelled, and the dry acetate obtained; at a higher temperature the salt suffers decomposition, and acetic acid, acetone, &c., is given off. Commercial acetate of lead is in general a confused crystalline mass, somewhat resembling broken lump-sugar. It is powerfully astringent and poisonous.

When pure it is completely soluble in distilled water acidulated with acetic acid forming a transparent colourless solution, "38 grains dissolved in water require for complete precipitation, 200 grains measures of the volumetric solution of oxalic acid." (B. P.)

Uses, &c. Acetate of lead is extensively employed in dyeing and calico-printing. In *medicine*, it is used as an astringent, styptic, and hæmostatic; in pulmonary, uterine, and intestinal hæmorrhage, colliquative diarrhœa, phthisical sweats, &c. It is usually combined with morphia or opium, and with acetic acid to prevent it passing into the state of the poisonous carbonate in the stomach.—*Dose.* ½ gr. to 2 grs. (Collier); 1 to 2 grs. to 8 or 10 grs., twice or thrice a day (Pereira); 3 grs. to 10 grs., every 6 or 8 hours (A. T. Thomson). *Externally*, as a collyrium, 10 grs. to water, 8 fl. oz. (A. T. Thomson); as a lotion, 20 grs. (A. T.

ɔmson), 1 dr. (Collier), to water, 8 or 10 fl. oz.;
ın injection, 40 grs. to rose water, ½ pint. The
on is cooling and sedative, and is commonly
d in excoriations, local inflammations, &c.

asic Acetates. There are several of these
s, but only one is of any importance.

**ribasic Lead Acetate, or Double Plumbic
tate, and Dioxide.** Pb $(C_2H_3O_2)_2$ 2 Pb O.
. SUBACETATE OF LEAD; BASIC LEAD CI-
TE; GOULARD'S ACETATE OF LEAD; PLUMBI
ACETAS (B. P.) *Prep.* Litharge, 7; acetate
ead, 10; and distilled water, 40; are boiled
f-an-hour, and evaporated down, and allowed
rystallise out of contact with air.

sed under the form of "Plumbi subacetas
ıor" v. (B. P.)

ead, Arse''niate of. $Pb_3(AsO_4)_2$. *Syn.* ARSE-
E OF L.; PLUMBI ARSENIAS, L. *Prep.*
dually add a solution of acetate of lead to
ther of arseniate of sodium. A white, in-
ble powder. Proposed as an external ap-
ation in certain forms of cancer.

ead, Bro'mide of. $PbBr_2$. *Syn.* PLUMBI
MIDUM, L. *Prep.* By precipitating a solu-
ı of neutral acetate or nitrate of lead with a
tion of bromide of potassium. A white,
stalline powder, sparingly soluble in water.
uses by heat into a red liquid, which turns
ow when cold. It has been used in the
ıe cases as iodide of lead.

ead, Car'bonate of. $PbCO_3$. *Syn.* PLUMBI
BONAS, L. *Prep.* by precipitating a cold
tion of either acetate or nitrate of lead with
lution of an alkaline carbonate, observing
vell wash the precipitate and dry it in the
le. This preparation is seldom employed,
commercial carbonate (WHITE LEAD) being
stituted for it. See WHITE PIGMENTS.

ead, Chloride of. $PbCl_2$. *Syn.* CHLORIDE
D; PLUMBI CHLORIDUM (Ph. L. 1836).
p. (Ph. L. 1336.) Dissolve acetate of lead,
z., in boiling water, 3 pints; next dissolve
ride of sodium, 6 oz., in boiling water, 1
; mix the two solutions, and when cold,
h and dry the precipitate. A white, crys-
ne powder.

issolve finely powdered litharge in boiling
te hydrochloric acid, and set aside the filtered
tion to cool. Brilliant colourless needles.

rop. Soluble in 135 parts of cold and in 22
s of boiling water; it melts when heated,
solidifies on cooling, forming a horn-like
stance (horn lead; plumbi corneum).

ses, &c. In the Ph. L. 1836 chloride of
was ordered to be employed in the prepa-
on of 'hydrochlorate of morphia.' Mr.
on highly recommends it in cancerous affec-
s, to allay pain and restrain morbid action,
er in the form of a lotion or ointment.

arious mixtures of lead chlorides and oxide
employed as a white pigment under the
ıe of 'Pattison's white.' It is prepared by
dly mixing a boiling solution of lead
ride with an equal volume of lime water.
ther similar compound is called 'patent
ɔw' or 'Turner's yellow.'

Lead, Chromate of. $PbCrO_4$. *Syn.* LEMON YELLOW, LEIPZIG YELLOW, PARIS YELLOW *Prep.* By adding a filtered solution of acetate or nitrate of lead to a like solution of chromate of potassium, as long as a precipitate forms, which is collected, washed with water, and dried. For information respecting the manufacture of this substance on the large scale, as a colouring substance (chrome yellow), see YELLOW PIGMENTS.

Lead, Dichromate of. *Syn.* CHROME ORANGE, CHROME RED. $PbCrO_4 . PbO$. *Prep.* By adding to a solution of nitrate or acetate of lead a solution of chromate of potassium, to which an equivalent of potassa has been added. This compound, is of a splendid scarlet colour. See RED PIGMENTS.

Lead, Cy'anide of. $PbCy_2$. *Syn.* PLUMBI CYANIDUM, L. *Prep.* By adding hydrocyanic acid to a solution of acetate of lead, as long as a precipitate forms, which, after being washed with distilled water, is dried by a very gentle heat, and preserved from the light and air. Sometimes used as a source of medicinal hydrocyanic acid.

Lead, Iodide of. PbI_2. *Syn.* LEAD IODIDE; PLUMBI IODIDUM, (B. P., Pho. L. E. D.) *Prep.* (B. P.) Nitrate of lead, 4; iodide of potassium, 4; distilled water, a sufficiency. Dissolve with the aid of heat the nitrate of lead in 30 of water, and the iodide of potassium in 10 of water, mix, collect the precipitate, wash, and dry at a gentle heat.

Prop., &c. A rich yellow-coloured powder, soluble in acetic acid, alcohol, and boiling water; when heated, it fuses and volatilizes in yellow vapour, but with a higher degree of heat, violet vapours of iodine are evolved, leaving a residuum (lead) which is wholly soluble in nitric acid.—*Dose.* ½ gr. to 4 grs. or more, made into a pill; as a deobstruent and resolvent, in enlargements of the cervical, axillary, and mesenteric glands, and in scrofulous affections and schirrous tumours.

Lead. Nitrate of. Pb $(NO_3)_2$. *Syn.* PLUMBI NITRAS, L. (B. P., Ph. E. D.)

Prep. (Ph. D.) Litharge (in fine powder), 1 oz.; pure nitric acid, 2 fl. oz., diluted with water, ½ pint; mix, apply a sand-heat, and evaporate to dryness, occasionally stirring; boil the residuum in water, 2½ pints; filter, acidulate with a few drops of nitric acid, evaporate to a pellicle, and set the liquid aside to cool; lastly, dry the deposited crystals on bibulous paper, and preserve them in a well-closed bottle.

(Commercial). By dissolving white lead in dilute nitric acid, and crystallising.

Uses, &c. This salt is extensively used in calico printing, and in the preparation of the iodide and other salts of lead. It was formerly much esteemed in asthmas, hæmorrhages, and epilepsy. It is now often used in an external application in cancer, ulcers, wounds, and various cutaneous affections. It is the basis of Liebert's celebrated 'cosmétique infallible,' and of Ledoyen's 'disinfecting fluid.' A very weak solution is an excellent application to chapped nipples, lips, hands, &c.—*Dose.* ½ to 1 gr.; in the form of pill or solution, washed down with a table-spoonful of water very slightly acidulated with nitric acid.

Lead, Nitro-sac'charate of. *Syn.* PLUMBI NITROSACCHARAS, L. *Prep.* (Dr. S. E. Hoskins.) Nitric acid, 1 part; water, 19 parts; mix; in this dilute acid saccharate of lead (in fine powder) is to be dissolved, and set aside that crystals may form, which are to be dried by pressure between the folds of bibulous paper. A weak solution of the salt, acidulated with saccharic acid, has been employed by Dr. Hoskins as a solvent for phosphatic calculi, with apparent success.

Lead, Oxide of. PbO. *Syn.* MONOXIDE OF LEAD, PROTOXIDE OF LEAD, YELLOW OXIDE OF LEAD, PLUMBI OXYDUM (B. P.) *Prep.* This substance is obtained perfectly pure by expelling the acid from nitrate of lead, by exposing it to heat in a platinum crucible; or, still better, by adding ammonia to a cold solution of nitrate of lead until the liquid becomes faintly alkaline, washing the precipitate with cold water, drying it, and heating it to moderate redness for 1 hour.

Prep., &c. Pure protoxide of lead has a lemon-yellow colour, and is the best of all the salts of lead. It is very heavy, slightly soluble in water, and freely so in acids, particularly when in the hydrated state; the aqueous solution has an alkaline reaction; at a red heat it melts, and assumes a semi-crystalline form on cooling; in the melted state it rapidly attacks and dissolves siliceous matter, with which it unites to form glass (flint glass); when heated along with organic substances of any kind, it is easily reduced to the metallic state.

On the commercial scale, this oxide is prepared by heating the gray film or dross that forms on the surface of melted lead when freely exposed to the air. When the process is arrested, as soon as the oxide acquires a uniform yellow colour, it is called massicot; when the heat is still further increased, until it fuses or partially vitrifies, it forms litharge of which there are several varieties. See LITHARGE, MASSICOT.

Lead, Red Oxide of. *Syn.* RED LEAD, MINIUM. *Prep.* This is prepared by exposing unfused protoxide of lead to the air for a long time, at a dull red heat. It is a very heavy powder, of a fine red colour, decomposed by a strong heat into protoxide of lead, and oxygen gas, which is evolved. Somewhat uncertain in its composition, but is generally of the composition Pb_2O_4 or $PbO_2,2PbO$. See RED PIGMENT.

Lead, Dioxide. PbO_2. *Syn.* BINIODIDE OF LEAD, PEROXIDE OF LEAD, PUCE OXIDE OF LEAD. *Prep.* By digesting red oxide of lead in dilute nitric acid; or by infusing a mixture of protoxide of lead and chlorate of potassium at a heat a little below redness, and washing the powdered mass in water; or by transmitting a current of chlorine gas through a solution of neutral acetate of lead. This oxide gives up half its oxygen at a red heat; acids also decompose it. Its chief use is in chemical analysis, to separate sulphurous acid from certain gaseous mixtures, which it converts into sulphuric acid, which it at the same time absorbs, forming sulphate of lead. It has recently been employed as an oxidizing agent in the manufacture of the ANILINE DYES.

Lead, Pyrolig'nite of. Sugar of lead made with rough pyroligneous acid. Used in dyeing, chiefly for the preparation of acetate of alumina.

Lead, Sac'charate of. *Syn.* PLUMBI SACCHARAS, L. *Prep.* (Dr. S. E. Hoskins.) Nitric acid, 2 parts; water, 10 parts; mix in a porcelain capsule, add of sugar, 1 part; and apply heat until reaction ceases; then dilute the liquid with distilled water, neutralize it with powdered chalk, filter, and add to the filtrate a solution of acetate of lead, as long as a precipitate (saccharate of lead) forms; lastly, collect the precipitate on a filter, wash and dry it. Used to make nitro-saccharate of lead, and as a source of saccharic acid.

Lead, Sul'phate of. $PbSO_4$. *Syn.* PLUMBI SULPHAS, L. This salt occurs native in transparent octahedra (lead vitriol), and is obtained in large quantities as a by-product in the preparation of acetate of aluminum for dyeing.

Prep. By adding dilute sulphuric acid to a solution of a soluble salt of lead. It is very sparingly soluble in water and in dilute sulphuric acid, soluble in strong hydrochloric acid and bitartrate of ammonium.

Lead, Sul'phide of. PbS. *Syn.* PLUMBI SULPHIDE. This occurs abundantly in nature in the form of GALENA.

Prep. By fusing metallic lead with sulphur or by passing sulphuretted hydrogen through a solution of a salt of lead.

Lead, Tan'nate of. *Syn.* PLUMBI TANNAS, L. *Prep.* Precipitate a solution of acetate of lead with an infusion of galls, and wash and dry the precipitate. Astringent, sedative, and hæmostatic.—*Dose.* 1 gr. and upwards, made into a pill. It has been highly recommended in the form of ointment and cataplasms, in bed-sores, chronic ulcers of the feet, white swellings, &c.

Lead, Tar'trate of. *Syn.* PLUMBI TARTRAS, L. *Prep.* By precipitating acetate of lead, by tartrate of ammonium, washing and drying.

LEAD, GRANULATED. *Prep.* By melting new lead, and pouring it in a small stream, from an iron ladle with a hole drilled in its bottom, into a pail of water. Used to make solutions and alloys.

LEAD, RED. See RED PIGMENTS.

LEAD, WHITE. See WHITE PIGMENT.

LEAD DUST. *Syn.* PULVIS PLUMBI, PLUMBUM DIVISUM, L. *Prep.* By melting new lead, adding bruised charcoal, mixing by violent agitation, which must be continued until the tal "sets," and then pounding and washing ay the charcoal. Used by potters.

LEAD PYROPH'ORUS. See Pyrophorus.

LEATH'ER. *Syn.* Corium, corius, L. ather is the skin of animals which has been pared by one or other of several processes pted for the purpose, having the common ect of preventing its spontaneous destruc- n by putrefaction, besides other objects, ich are more or less peculiar to each variety this useful substance.

eather is only prepared on the large scale, l primarily either by the process of 'TAN- IG' or 'TAWING,' in the manner briefly de- ibed under these heads.

urried Leather is leather which has been ned, and sold to the currier, who, after king it in water, and rubbing it to soften it, es it even with a broad, sharp knife, rubs with a piece of polished stone or wood, l, whilst still wet, besmears it with oil or ase (DUBBING), which gradually penetrates leather as the moisture evaporates. It t undergoes the operation of 'waxing,' ich consists of first rubbing it on the flesh e with a mixture of oil and lamp black; it hen 'black-sized' with a brush or sponge, l, when dry, is lastly 'tallowed' with a per cloth, and 'slicked' upon the flesh side h a broad and polished lump of glass. ather curried on the hair or grain side, med 'black on the grain,' is blackened by ting it with iron liquor, and rubbing it h an iron 'slicker' before applying the oil grease. The grain is finally raised by the mmel' or 'graining board' passed over it various directions. .

eather is dyed or stained by the appli- ion, with an ordinary brush, of any of the ong liquid dyes, in the cold or only gently ted, to the surface of the skin previously etched on a board. The surface, when dry, ommonly finished off with white of egg and pommel or smoothing stick. Bookbinders nerally employ copperas water as a black in or sprinkle; a solution of indigo as a blue ; and a solution of salt of tartar or common a, as a brown one.

eather, before being japanned or varnished, n the preparation of what is called 'ENA- LLED' and 'PATENT LEATHER,' is carefully ed from grease by the application of ab- bent substances or hard pressure between ers, and the surface is nicely shaved, othed, and polished by appropriate tools, varnish is then applied to the grain side the former, and the flesh side of the skin the latter, which is previously stretched tight on a board to receive it. The whole lastly, submitted to a gentle stove-heat to den the varnish; and the process is re- ted, if necessary.

Jses, &c. These are well known, and are all universal. The leather manufacture of at Britain is equal in importance and utility ny other department of our industry, and inferior in point of value and extent only to those of cotton, wool, and iron. "If we look abroad on the instruments of husbandry, on the implements used in most of the mechanic trades, on the structure of a multitude of engines and machines; or if we contemplate at home the necessary parts of our clothing—breeches, shoes, boots, gloves—or the furniture of our houses, the books on our shelves, the harness of our horses, or even the substance of our carriages; what do we see but instances of human industry exerted upon leather? What an aptitude has this single material in a variety of circumstances for the relief of our necessities, and supplying conveniences in every state and stage of life? Without it, or even without it in the plenty we have it, to what difficulties should we be exposed?" (Dr. Campbell.) Leather is a kind of natural felt, but of much closer and firmer texture than that of artificial origin. "The thinner and softer kinds of leather are sometimes used as body-clothing; but its special and proper purpose is the manufacture of coverings for the feet, to protect them from cold and water." (Eras. Wilson.) See Japanning, Varnish, &c.

LEAV'EN. Dough which has become sour or run into a state of incipient putrefaction. When a small quantity of it is added to recent dough, it excites fermentation, but is apt to produce a disagreeable taste and odour in the bread. It is now superseded by yeast. Both these substances are used in the same way.

LEAVES (Medicated). *Syn.* Folia medicata, L. On the Continent several preparations of this kind are in use. In many cases the leaves of tobacco deprived of nicotine, by soaking them in water, are dried, and then moistened or steeped in a tincture or infusion of the medicinal substance. In this way belladonna, camphor, and henbane, are often administered. Cruveillier recommends opiated belladonna leaves for smoking in troublesome coughs, phthisis, spasmodic asthmas, &c., to be prepared as follows:—Belladonna leaves, 1 oz., are steeped in an infusion of opium, 10 grs., in water, 1 fl. oz. (or less), and are then carefully dried in the shade. "Mustard leaves (Riggollot's) consist of mustard moistened with water, spread on paper, and dried." (Squire.) See Cigars (in *pharmacy*), and Vegetable Substances.

LECANOR'IC ACID. See Orsellinic Acid.

LEECH. *Syn.* Hirudo (B. P., Ph. L. & D.), L. The officinal leech of the Pharmacopœias is the *Sanguisuga medicinalis* (*Hirudo medicinalis*—Cuv.), familiarly known as the 'old English' or 'speckled leech.' It is also occasionally called the 'Hamburg gray' or 'Russian leech,' from being imported from those parts. Its characteristics are—Back, greenish or olive-green, sometimes almost black or intense brown, with 6 rusty-red or yellowish longitudinal stripes, which are mostly spotted with black.—Belly, dirty yellow or light olive-green, spotted more or less with black. The spots are very variable in size and number; in some cases few, in others so numerous as to form the prevailing tint of the belly. This variety, which is the most valuable of the commercial leeches, is chiefly imported from Hamburg.

Another variety of leech, the *Sanguisuga officinalis*, familiarly known as the 'Hamburg' or 'French green leech,' are imported from Bordeaux, Lisbon, and Hamburg. Its characteristics are—Back, brownish olive-green, with 6 reddish or rusty-yellow longitudinal bands.—Belly, light dirty pea-green, or yellowish-green, free from spots, but exhibiting two lateral stripes. This leech is vastly inferior to the preceding variety, and some of those imported from France and Portugal are absolutely useless, from their indisposition to bite, arising from the fraud practised by the collectors and dealers, of gorging them with blood to improve their appearance before sending them to market. The above are the species of leech commonly employed in medicine in this country, but many others are noticed by writers on the subject.

Leeches are best preserved in water obtained from a pond, and occasionally changed; when kept in spring water, they soon die. The introduction of a hand to which an ill-flavoured medicine or odour adheres into the water in which they are kept, is often sufficient to poison them. The application of saline matter to the skin of leeches, even in very small quantities, immediately occasions the expulsion of the contents of the stomach; hence a few grains of common salt are frequently sprinkled over them, to make them disgorge the blood which they have swallowed. The frequent changing of the water in which leeches are kept is injudicious. Once a month in winter, and once a week in summer, is deemed sufficiently often by the large dealers, unless the water becomes discoloured or bloody, when it should be changed every day, or every other day. When clean pond water cannot be obtained, clean rain water that has been well exposed to the air should alone be employed. Mr. J. R. Kenworthy recommends placing in the water a few balls of irregular lumps of pure clay, about 2¼ inches in diameter; a method which we can recommend as both simple and successful. The plan adopted by M. Fée is as follows:—Place 7 inches of a mixture of moss, turf, and charcoal, in a marble or stone trough, over which sprinkle some small pebbles. At one end of the trough, and about half way up, place a thin shelf of stone or marble, pierced with small holes, on which put first some moss, or portions of marsh horse-tail (*Equisetum palustre*), and on this a layer of pebbles to keep it down; then pour in water sufficiently high just to moisten the moss and pebbles, put in the leeches, and tie over the mouth of the trough with a cloth. Another plan consists in keeping the leeches in a glass tank, or aquarium, provided with a pebbly bottom and a few healthy aquatic plants.

Propag. According to Dr. Wagner, an annual feast on living blood is necessary to render leeches able to grow and propagate. These conditions can only be fulfilled by restoring to the breeding cisterns those which have been already employed. All artificial methods of feeding them, by bladders or sponges of blood, have been found to fail. He recommends the employment of two tanks, with the bottom formed of loam, clay, or turf, surrounded by an inner border of a similar substance, and an outer one of sand—the one for leeches fit for medical use—and the other for breeding, or for such leeches as have been applied. No leeches are to be taken from the breeding tank until a year has elapsed after their having been applied and fed with human blood; and their removal to the first tank should take place in September or October, as by this time the breeding season is over. By this plan all leeches that have been applied are to be carefully restored to the breeding tank, without making them disgorge the blood they have swallowed.

LEECH'ING. This consists in the application of leeches to any vascular part of the body, for the purpose of withdrawing blood from it, and thus allaying local inflammation, distension of vessels, &c. Leeches are most conveniently applied by means of a common pill-box or a wine-glass. The part should be previously washed perfectly clean, and if covered with hair should be closely shaved. Sometimes leeches are indisposed to bite; in such cases, allowing them to crawl over a piece of dry linen or calico, rolling them in porter, moistening the part with a little milk or sweetened milk, or drawing a little blood by a slight puncture or scratch, will usually make them bite freely. To stop the bleeding from leech-bites, various plans are adopted, among which the application of nitrate of silver or creasote, or gentle pressure for some hours with the finger, are the most successful. Of late years a piece of matico leaf or soldier's herb, applied in the same manner as a piece of lint, has been commonly adopted to stop the bleeding of leech-bites.

LEEK. *Syn.* Porrum, L. The *Allium porrum* (Linn.). Its general properties are intermediate between those of the onion and garlic. The juice is said to be powerfully diuretic, and capable of dissolving phosphatic calculi.

LEGU'MIN. Vegetable casein. It is found most abundantly in the seeds of leguminous (podded) plants, *e. g.*, beans, peas, &c.

LEM'ON. *Syn.* Limo, L. The fruit of the *Citrus limonum* or lemon tree. The juice, peel, and essential oil, are officinal. See Oil, and *below*.

LEM'ON AC'ID. See Citric Acid.

LEM'ON FLA'VOUR. See Essence of Lemon.

LEM'ON JUICE. *Syn.* Limonis succus

ı, Succus limonum (Ph. L. & D.), L. ice of the lemon, obtained by squeezing raining. When freshly expressed, it is owing to the presence of mucilage and ;ive matter. These substances render ice liable to decomposition, and various ls have from time to time been proposed eserving it. Amongst these may be ıned the addition to the fresh juice of ır cent. of bisulphite of calcium, or ten ıt. of proof spirit.

e have examined the juice expressed ;wo varieties of lemons, viz., Palermo essina, with the following results:

	Palermo.	Messina.
ces of juice yielded / 100 lemons	108	96
;ific gravity of juice	1044·85	1038·56
centage of citric acid	8·12	7·04
centage of ash	0·289	0·301

parts of the ash of the juice of Palermo ı gave:

Sulphuric acid	10·59
Carbonic acid	16·33
Chlorine	0·81
Phosphoric acid	6·74
Ferric phosphate	1·32
Lime	8·89
Magnesia	3·02
Potash	47·84
Soda	3·32
Silica	0·72
Loss	0·42
	100·00

emons are kept a few months before ing, the yield of juice is slightly in- l, but its specific gravity and per centage ic acid remain unaltered. It is erroneous pose that the acid of the lemon is, by g, changed into sugar. We have kept ı for 12 months, and found that the per e of acid was not diminished. A certain tion of sugar was formed, but at the e of the soluble starch, contained in the lls of the lemon. Lemon juice on being ı found to decrease in density, but the t of acid remains the same." (Hark-

ıon juice may be preserved by heating it ° Fahr., filtering, and setting it aside in ı completely filled. If this process be med in the winter, the juice, it is said, ıe kept perfectly good for 12 months. lemon juice is prevented from decomposi- nd rendered fit for exportation by mix- with $\frac{1}{10}$th of alcohol. (Schweitzer.)

ılt. Lemon juice is frequently adulte- the adulterants being water, sugar or ınd sulphuric or acetic acid. The *modus ıdi* is, to dilute the genuine juice with and then bring up the density with the or gum, and the per centage of acid with other of the above acids. The examination of lemon and lime juice supplied to the navy is now conducted in the Inland Revenue Laboratory, Somerset House, and it speaks well for that department when we say that cases of scurvy on board ships are now of very rare occurrence. No juice is passed unless it comes up to a certain standard in specific gravity, and per centage of citric acid, and any sample containing any other acid is at once rejected.

Prop. Lemon juice is refrigerant and antiscorbutic, and has long been extensively employed in the preparation of cooling drinks and effervescing draughts, which are justly esteemed as wholesome summer beverages, as well as palliatives in fevers, nausea, &c. In scurvy, there is no remedy equal to freshly expressed lemon juice; and in acute rheumatism and gout, according to the united testimony of Dr. Owen Rees, Dr. Babington, and numerous Continental practitioners, it has been exhibited with considerable success. In agues, dysentery, English cholera, nausea, and vomiting, heartburn, putrid sore-throat, hospital gangrene, syphilis, and numerous skin diseases, it has proved most serviceable. See Citric acid, Gout, &c.

Lemon Juice, Facti″tious. *Syn.* Solutio acidi citrici, Succus limonum factitius, L. *Prep.* 1. Citric acid, 1¼ oz.; carbonate of potassa, 45 grs.; white sugar, 2½ oz.; cold water, 1 pint; dissolve, add the yellow peel of a lemon, and in 24 hours strain through a hair sieve or a piece of muslin.

2. As the last, but using 15 or 16 drops of oil of lemon, to flavour, instead of the lemon peel.

Obs. The above is an excellent substitute for lemon juice, and keeps well in a cool place. Tartaric acid, and even vinegar, are sometimes used instead of citric acid; but it is evident that it then loses all claim to being considered as an imitation of lemon juice, and to employ it in lieu of which would be absurd.

LEM′ON PEEL. *Syn.* Cortex limonum, (B. P., Ph. L.), L. "The fresh outer part of the rind." (B. P.) "The fresh and the dried exterior rind of the fruit;" the latter dried "in the month of April or May." (Ph. L.) Candied lemon peel (cortex limonum conditus) is employed as a dessert, and as a flavouring ingredient by cooks and confectioners. It is reputed stomachic. See Candying.

LEM′ON PIC′KLE. See Sauce.

LEMONADE′. *Syn.* Lemon sherbet, King's cup; Limonadum, L.; Limonade, Fr. *Prep.* 1. Lemons (sliced), 2 in no.; sugar, 2½ oz.; boiling water, 1½ pint; mix, cover up the vessel, and let it stand, with occasional stirring, until cold, then pour off the clear through a piece of muslin or a clean hair sieve.

2. Juice of 3 lemons; yellow peel of 1 lemon, sugar, ½ lb.; cold water, 1 quart; digest for 5 or 6 hours, or all night, and decant or strain as before.

3. Citric acid, 1 to 1½ dr.; essence of lemon,

10 drops; sugar, 2 oz.; cold water, 1 pint; agitate together until dissolved.

Obs. Lemonade is a pleasant, cooling summer beverages, and when made as above, may be drank in large quantities with perfect safety. It also forms an excellent refrigerant and antiseptic drink in fevers and putrid diseases generally. Tartaric acid is commonly substituted for citric acid, from being cheaper; it is, however, much inferior, being less wholesome and less agreeable. Lemonade for icing is prepared as above, only using a little more sugar. Orange sherbet, or orangeade for icing, is made in a similar way from oranges.

Lemonade, Aera'ted. *Syn.* LIMONADUM AERATUM, L.; LIMONADE GAZEUSE, Fr. *Prep.* 1. (P. Cod.) Water, charged with 5 times its volume of carbonic acid gas, 1 pint; syrup of lemon, 2 oz.; mix.

2. (Without a bottling machine.)—*a.* Into each bottle put lemon syrup, 1 to 1½ oz.; essence of lemon, 3 drops; sesquicarbonate of soda, ½ dr.; water, q. s. to nearly fill the bottle; have the cork fitted and ready at hand, then add of tartaric acid (cryst.), 1 dr.; instantly close the bottle, and wire down the cork; it should be kept inverted in a cool place, and, preferably, immersed in a vessel of ice-cold water.

b. As the last, but substituting lump sugar, ¾ oz., for the lemon syrup.

c. From lump sugar, 1 oz.; essence of lemon, 3 drops; bicarbonate of potassa, 25 grs.; water, q. s., as No. 1; then add citric acid (cryst.), 45 grs., and cork, &c., as before. The last is most wholesome, especially for the scorbutic, dyspeptic, gouty, and rheumatic.

Obs. The best aerated lemonade of the London makers is prepared by putting 1½ fl. oz. of rich lemon syrup into each bottle, which is then filled up with aerated water at the bottling machine.

Lemonade, Antimo''niated. *Syn.* LIMONADUM ANTIMONIATUM, L. *Prep.* By adding tartar emetic, 1 gr., to each pint of ordinary lemonade.—*Dose.* A wine-glassful, every ½ hour or hour; as a diaphoretic and expectorant. See ANTIMONY (Potassio-tartrate).

Lemonade, Ape''rient. *Syn.* LIMONADUM LAXATIVUM, L. *Prep.* 1. Sugar. 1 oz.; lemon juice, ¾ fl. oz.; sulphate of soda, 3 drs.; water, 8 fl. oz.; put them into a soda-water bottle without shaking, have the cork ready fitted, add of sesquicarbonate of soda (in cryst.), ½ dr., and instantly cork the bottle, wire it down, and keep it in a cool place, inverted. For a dose.

2. Heavy carbonate of magnesia, 1½ dr.; refined sugar, 1 oz.; essence of lemon, 5 or 6 drops; water, 8 fl. oz.; bottle as last, then add of citric acid (cryst.), 3 drs., and instantly cork, &c., as before. For a dose. It should be kept for at least 24 hours before being taken.

Lemonade, Lactic. *Syn.* LIMONADUM LACTICUM, L. *Prep.* (Magendie.) Lactic acid, 1 to 4 drs.; syrup, 2 oz.; water, 1 pint; mix. Recommended in dyspepsia, &c.

Lemonade, Milk. *Syn.* LIMONADUM LACTIS, L. *Prep.* Take of sugar, ½ lb.; water, 1 pint; dissolve, add the juice of 3 lemons; milk or whey, ½ pint; stir the whole together and strain through a hair sieve. Some persons add a glassful of sherry.

Lemonade, Min'eral. *Syn.* LIMONADE MINERALE, Fr. On the Continent this name is applied to various drinks consisting of water acidulated with the mineral acids and sweetened with sugar. Thus we have limonade chlorhydrique, nitrique, phosphorique, sulphurique, &c., all of which are used as cooling drinks in fevers, inflammations, skin diseases, &c.

Lemonade, Port'able. See POWDERS.

LEMONADE POWDERS. See POWDERS.

LEMONATED KALI. See KALI, POTASSA (Citrate), &c.

LEN'ITIVES. In medicine, purgatives which act in a gentle manner, and have a soothing effect. See LAXATIVES.

LENS. In optics, a piece of glass or other transparent medium, having one or two curved surfaces, either convex or concave. A description of the different kinds of lenses belongs to a work on optics. It may, however, be useful to the chemical student to remark here that the CODDINGTON and STANHOPE LENSES, which may now be bought at any of the opticians, neatly mounted and of great power, for a few shillings, will be found of the greatest service in examining minute crystals, precipitates, &c.; and for all ordinary purposes offer a cheap and efficient substitute for more complicated microscopes. An extemporaneous instrument, possessing considerable power, may be made by simply piercing a small circular hole in a slip of metal, and introducing into it a drop of water, which then assumes a spherical form on each side of the metal, while the latter is held in a horizontal position. The ingenious little TOY MICROSCOPES sold about the streets of London, under the form of a perforated pill-box, at one penny each, consist of such a lens made with Canada balsam instead of water, which has the property of hardening without losing its transparency after exposure for a few hours to the air. A still simpler substitute for a lens is a piece of blackened card-paper, with the smallest possible needle-hole pierced through it. Any very small object held in a strong light, and viewed through this hole at the distance of about an inch, will appear quite distinct, and from 10 to 12 times larger than its usual size. We have often found this little instrument of incalculable service in situations and under circumstances in which a more powerful or complicated apparatus was unattainable or could not be applied.

LEN'TIL. *Syn.* LENS, L. The seed of the *Ervum Lens*, a plant of the natural order *Leguminosæ*. The lentil is considerably smaller than an ordinary pea, and is of the shape of a double convex lens. Several varieties are cultivated on the Continent of Europe and in many parts of Asia, where they are largely consumed as human food. Lentils are more nourishing than any other description of pulse, but are reputed difficult of digestion, apt to disorder the bowels, and injurious to the eyes. Several alimentary preparations, sold at high prices as cures for dyspepsia, constipation, &c., contain lentil flour as the principal ingredient. See ERVALENTA and REVALENTA.

LETH'ARGY. *Syn.* LETHARGUS, L. A heavy, unnatural sleep, sometimes bordering upon apoplexy, with scarcely any intervals of waking, from which the patient is with difficulty aroused, and into which he again sinks as soon as the excitement is withdrawn. It frequently arises from plethora, in which case depletion is indicated; or from the suppression of some usual discharge or secretion, which it should then be our business to re-establish. It also often arises from over mental fatigue and nervous debility, when relaxation from business, the use of a liberal diet, and ammoniacal stimulants and antispasmodics, are found useful. When depending on a determination of blood to the head, cupping may be had recourse to, and all sources of excitement avoided. In all cases the bowels should be moved as soon as possible by means of mild purgatives.

LET'TUCE. *Syn.* LACTUCA, L. The early leaves or head of the *Lactuca sativa,* or garden lettuce, forms a common and wholesome salad. They are reputed as slightly anodyne, laxative, hypnotic, and antaphrodisaic, and have been recommended to be eaten at supper by those troubled by watchfulness, and in whom there exists no tendency to apoplexy. The leaves and flowering tops of *L. virosa* are officinal in the B. P., the "flowering herb" (LACTUCA) in the Ph. L.; the "inspissated juice," in the Ph. E.; and the "inspissated juice and leaves," in the Ph. D. The "inspissated juice" of *Lactuca virosa,* or strong-scented wild lettuce, is also officinal in the Ph. E.; and both the "leaves and inspissated juice" of the same variety are ordered in the Ph. D. The last species is more powerful than the cultivated lettuce. See EXTRACT and LACTUCARIUM.

LEUCORRHŒ'A. *Syn.* WHITES; CATARRHUS VAGINÆ, FLUOR ALBUS, L. The symptoms of this disease are well known to most adult females. The common causes are debility, a poor diet, excessive use of hot tea, profuse menstruation or purgation, late hours, immoderate indulgence of the passions, frequent miscarriages, protracted or difficult labours, or local relaxation. Occasionally it is symptomatic of other affections. The treatment must be directed to the restoration of the general health, and imparting tonicity to the parts affected. Tepid or sea bathing, or shower baths; bark, chalybeates, and other tonics; with local affusions of cold water, and mild astringent injections, as those of black tea or oak bark, are generally found successful in ordinary cases.

LEVANT' NUT. See COCCULUS INDICUS.

LEVIGA'TION. *Syn.* LEVIGATIO, L. The process of reducing substances to fine powder, by making them into a paste with water, and grinding the mass upon a hard smooth stone or slab, with a conical piece of stone having a flat, smooth, under surface, called a 'muller.' Levigation is resorted to in the preparation of paints on the small scale, and in the elutriation of powders. The term is also, sometimes, incorrectly applied to the lengthened trituration of a substance in a marble or wedgwood-ware mortar.

LEVORACE'MIC ACID. See RACEMIC ACID.

LEY'DEN JAR. *Syn.* LEYDEN PHIAL, ELECTRICAL JAR. An instrument for the accumulation of the electric fluid. Its simplest form is that of a wide-mouthed jar of rather thin glass, coated on both sides with tin-foil, except on the upper portion, which is left uncoated, and having a cover of baked wood, through which passes a brass wire, terminating in a metallic knob, and communicating with the inner coating. To charge the jar, the outer coating is connected with the earth, and the knob put in contact with the conductor of an electrical machine. The inner and outer surfaces of the glass thus become respectively positive and negative, and the particles of the glass become strongly polarised. On making connection between the two coatings with a conducting substance, discharge takes place by a bright spark and a loud snap; and if any part of the body be interposed in the circuit, a shock is felt.

LIBAVIUS'S LIQUOR. See TIN (Bichloride).

LI'CHEN. In pathology, a dry papulous or pimply eruption of the skin, terminating in scurfy exfoliations. "Lichen exhibits great variety in its outward characters in different individuals; in one, the pimples are brightly red; in another, of debilitated constitution, they are bluish and livid; in a third, they are developed around the base of hairs; in a fourth, they appear as circular groups, and increase by their circumference, while they fade in the centre, forming so many rings of various size; in a fifth, a modification of the preceding, they have the appearance of flexuous bands; while in a sixth, they are remarkable for producing intensity of suffering, or unusual disorganization of the skin. They are all occasioned by constitutional disturbance, sometimes referable to the digestive, and sometimes to the nervous system. In some instances, however, they depend upon a local cause. I have had a crop of lichenous pimples on the backs of my hands from rowing in hot weather; and in hot climates that annoying disorder called prickly heat is a lichen." (Eras. Wilson.) The treatment of this affection is noticed under ERUPTIONS (Papular).

LI'CHENS. *Syn.* Lichenes—Juss., Lichenales—Lind., L. In botany, these are cryptogamous plants, which appear under the form of thin, flat crusts, covering rocks and the barks of trees. Some of them, like Iceland moss (*Cetraria Islandica*), are esculent and medicinal, and employed either as medicine or food; and others, when exposed in a moistened state to the action of ammonia, yield purple or blue colouring principles, which, like indigo, do not pre-exist in the plant. Thus, the *Rocella tinctoria*, the *Variolaria orcina*, the *Lecanora tartarea*, &c., when ground to a paste with water, mixed with putrid urine or solution of carbonate of ammonia, and left for some time freely exposed to the air, furnish the archil, litmus, and cudbear of commerce, very similar substances, differing chiefly in the details of their preparation. From these the colouring matter is easily extracted by water or very dilute solution of ammonia. See Archil, Cudbear, and Litmus.

LIG'ATURE. In *surgery*, a small waxed piece of cord or string formed of silk or thread, employed for the purpose of tying arteries, veins, and other parts, to prevent hæmorrhage, or to cause their extirpation. To be safe and useful, they should be round, smooth, and sufficiently strong to permit of being tied with security without incurring the danger of breaking or slipping. There are many cases recorded in which emigrants, soldiers, and travellers, have lost their lives, from the simple inability of those around them to apply a ligature.

LIGHT. *Syn.* Lumen, Lux, L. Light acts as a vivifying or vital stimulus on organised beings; just as privation of light, or darkness, disposes to inactivity and sleep. "In maladies characterised by imperfect nutrition and sanguinification, as scrofula, rickets, and anæmia, and in weakly subjects with œdematous (dropsical) limbs, &c., free exposure to solar light is sometimes attended with very happy results. Open and elevated situations probably owe part of their healthy qualities to their position with regard to it." On the contrary, "in diseases of the eye, attended with local vascular or nervous excitement, in inflammatory conditions of the brain, in fever, and in mental irritation, whether attended or not with vascular excitement, the stimulus of light proves injurious, and, in such cases, darkness of the chamber should be enjoined. After parturition, severe wounds, and surgical operations, and in all inflammatory conditions, exclusion of strong light contributes to the well-doing of the patient." (Pereira.)

LIG'NIN. $C_6 H_{10} O_5$. *Syn.* Cellulose. This is woody fibre deprived of all foreign matter. It forms about 95$\frac{0}{0}$ of baked wood, and constitutes the woody portion of all vegetable substances. Fine linen and cotton are almost entirely composed of lignin, the associated vegetable principles having been removed by the treatment the fibres have been subjected to during the process of their manufacture.

Pure lignin is tasteless, inodorous, insoluble in water and alcohol, and absolutely innutritious; dilute acids and alkaline solutions scarcely affect it, even when hot; oil of vitriol converts it into dextrin or grape sugar, according to the mode of treatment. When concentrated sulphuric acid is added very gradually to about half its weight of lint, linen rag, or any similar substance shredded small, and contained in a glass vessel, with constant trituration, the fibres gradually swell up and disappear, without the disengagement of any gas, and a tenacious mucilage is formed, which is entirely soluble in water. If, after a few hours, the mixture be diluted with water, the acid neutralized by the addition of chalk, and, after filtration, any excess of lime thrown down by the cautious addition of a solution of oxalic acid, the liquid yields, after a second filtration, and the addition of alcohol in considerable excess, a gummy mass, which possesses all the characters of pure dextrin. If, instead of at once saturating the diluted acid solution with chalk, we boil it for 4 or 5 hours, the dextrin is entirely converted into grape sugar, which, by the addition of chalk and filtration, as before, and evaporation by a gentle heat to the consistence of a syrup, will, after repose for a few days, furnish a concrete mass of crystallised sugar. By strong pressure between folds of porous paper or linen, redissolving it in water, agitation with animal charcoal, and recrystallisation, brilliant colourless crystals of grape sugar may be obtained. Hemp, linen, or cotton, thus treated, yield fully their own weight of gum, and 1$\frac{1}{8}$ of their weight of grape sugar. During the above transformation, the sulphuric acid is converted into sulpholignic acid, and may be procured in a separate state. A solution of oxide of copper in ammonia, or solution of basic carbonate of copper in strong ammonia, dissolves cotton, which may then be precipitated by acids in colourless flakes.

LIG'NITE. *Syn.* Brown coal. Wood and other matter more or less mineralised and converted into coal. The lignites are generally dark brown, and of obvious woody structure. They are distinguished from true coals by burning with little flame and much smoke. Those of Germany are largely used as a source of paraffin and burning oils.

LIG'NUM VI'TÆ. See Guaiacum Wood.

LIME. CaO. *Syn.* Oxide of calcium; Chaux, Fr.; Kalk, Ger. Lime, when pure, and as a chemical and medical reagent, will be found treated of under Calcium (Oxide of). It is prepared on the large scale for commerce by calcining chalk, marble or limestone, in kilns, and is called quicklime, caustic lime, burnt lime, stone lime, &c. The lime kilns are usually of the form of an inverted cone, and are packed with alternate layers of limestone and fuel, and the burnt lime raked out from the bottom.

he lime thus obtained is a pale yellow powder, ombining eagerly with water, and crumbling a light white powder, "slaked lime," with he evolution of much heat. Lime which lakes well is termed "fat lime," while if it lakes badly is termed "poor lime."

Lime, Salts of. See under CALCIUM.

Lime, Pyrolignite of. An impure acetate f calcium used for making mordants in dyeing nd calico printing, as a substitute for the nore expensive acetate of lead.

Lime, Chloride of. *Syn.* BLEACHING POW-ER, CHLORINATED LIME, HYPOCHLORIDE OF ALCIUM.

A compound of hypochloride, chloride, and ydrate of lime in varying proportions, and nost extensively used for bleaching, thousands of tons being made near Newcastle alone very year.

Prep. Hydrate of calcium is thinly spread ut in a proper vessel and exposed to an atmosphere of chlorine gas until it is saturated. Tow included in the Materia Medica.

Hydrate of calcium, or slaked lime (fresh), 20 arts, common salt, 1 part, are mixed together, nd the powder placed in long earthenware vessels into which chlorine is passed until the mixure begins to grow damp, or until one part of t, dissolved in 130 parts of water, is capable of ecolouring 4½ parts of sulphate of indigo, hen the whole is transferred to dry bottles.

(Wholesale.) The chlorine is generated rom the usual materials mixed in leaden essels, heated by steam, and the gas, after assing through water, is conveyed by a leaden ube into an apartment built of siliceous sandtone, and arranged with shelves or trays, conaining dry fresh slaked lime, placed one above nother, about an inch asunder. The process, o produce a first-class article, is continued or 4 or 5 days. During this time the lime s occasionally agitated by means of iron rakes, he handles of which pass through boxes of ime placed in the walls of the chamber, which hus act as valves.

Prop., &c. Chloride of lime is a pale yellowish, hite powder, generally more or less damp, and volving a chlorine-like odour of hypochloric cid. Soluble in about 20 parts of water, and ecomposed by acids with the evolution of hlorine and a little oxygen. Good chloride of ime should contain from 32% to 36% of chloine, of which, however, but 25% to 30% can e easily liberated by an acid.

Estim. See CHLOROMETRY.

Uses. Chloride of lime is employed in mediine as an antiseptic and disinfectant. An intment of chloride of lime has been used in scrofula,' and a lotion or bath, moderately ilute, is one of the cleanest and readiest ays of removing the 'itch,' and several other kin diseases. It is also in great use as a disinectant, and may be used either in substance or olution. A small quantity of the powder pread on a flat dish or plate, and placed on e chimney-piece, and a like quantity in an opposite part of the room, will continue to evolve sufficient chlorine or hypochlorous acid to disinfect the air of an apartment for several days. The evolution of chlorine is promoted by occasionally renewing the exposed surface, by stirring it with a piece of stick, and, after it becomes scentless, by the addition of a little acid, as strong vinegar, or hydrochloric acid, or oil of vitriol, largely diluted with water. Of late, however, it has been partly superseded by the antiseptics,' carbolic acid, &c. The most extensive consumption of chloride of lime is, however, for bleaching textile fabrics. When employed for this purpose, the goods are first immersed in a dilute solution of this compound, and then transferred to a vat containing dilute sulphuric acid. The chlorine thus disengaged in contact with the cloth, causes the destruction of the colouring matter. This process is generally repeated several times, it being unsafe to use strong solutions. White patterns may thus be imprinted upon coloured cloth; the figures being stamped with tartaric acid thickened with gum water, the stuff is immersed in the chloride bath, when the parts to which the acid has been applied remain unaltered, while the printed portions are bleached white.

Concluding remarks.—Chloride of lime is now scarcely ever made on the small scale, as it can be purchased of the large manufacturer of better quality and cheaper than it could possibly be made by the druggist. The only secret in the manufacture of good bleaching powder is maintaining the temperature of the ingredients rather low.

LIME. The fruit of *Citrus limetta.* It resembles the lemon, but is smaller and has a smoother skin. It is imported into Great Britain in a preserved state for use as a dessert. Its juice is also largely imported for the preparation of CITRIC ACID, and for the prevention of scurvy on board ship (see *below*).

LIME JUICE. *Syn.* LEMON JUICE. The juice of the fruits of various species of *Citrus,* principally LIMES, is known in commerce under these names. It is very variable as to quality, which depends upon the method of extraction, the quality of the fruit, and the honesty of the shipper.

We have examined the juice expressed from limes sent from the West Indies, from Jamaica, and from South Africa, with the following results:

	W. Indies.	Jamaica.	S. Africa.
Specific gravity of juice . .	1041·30	1044·18	1044·90
Per cent. of citric acid .	7·96	8·66	8·50
Per cent. of ash	0·321	0·401	0·364

The yield from limes is very small, and the freshly expressed juice contains a large amount of pulp. This, however, on standing a few weeks, separates, and a clear sherry-coloured liquid is obtained.

A concentrated lime or lemon juice is used by calico printers. It is a "dark, treakly looking fluid, marking from 48° to 54° Twaddell," and contains about 30 per cent. of pure citric acid.

Adult. See LEMON JUICE.

Estim. Lime juice is only valuable on account of the citric acid it contains. If of good quality, 100 grs. will neutralise from 70 to 76 grs. of pure crystallised carbonate of soda. "For commercial purposes, each grain of carbonate of soda neutralised may represent a half grain of crystallised citric acid (equal to ·38 gr. of dry acid), and the value of the lime juice be calculated in proportion." (O'Neill.) As commercial lime juice contains variable proportions of vegetable extractive matter, the indications of the hydrometer cannot be depended upon. See ACIDIMETRY, CITRIC ACID, &c.

LIME'STONE. A general term applied to a great variety of rocks in which carbonate of lime is the principal constituent.

Estim. The value of chalk, limestone, marble, &c., for hydraulic mortars and cements, may be determined as follows:

A given weight (say 100 grs.) of the sample is reduced to powder and digested in hydrochloric acid diluted with about an equal weight of water, with frequent agitation for an hour or longer; the mixture is then diluted with thrice its volume of water, thrown upon a filter, and the undissolved portion washed, dried, ignited, and weighed. This weight indicates the per-centage of clay and silica or sand; and the loss that of the lime or calcium oxide, magnesium oxide, and ferric oxide, present in the substance examined. In most cases these results will be sufficient to show the quality of the limestone for the purpose of making mortar or cement.

The filtrate and the washings are mixed together, and ammonia is added in excess; the bulky, reddish-brown precipitate is collected, washed, dried, ignited, and weighed. This gives the per-centage of ferric oxide.

The filtrate, &c., from last is then treated with oxalate of ammonium, and the quantity of lime determined in the manner described under the head of CALCIUM.

The liquid filtered from the precipitate in last is boiled for some time with carbonate of potassium until ammoniacal fumes are no longer evolved; the precipitate is then collected on a filter, washed with hot water, dried, and strongly ignited for 3 or 4 hours, and, lastly, weighed. This gives the per-centage of magnesium.

LINC'TUS. [L., Eng.] *Syn.* LOCH, LOHOCH, LINCTURE, LAMBATIVE; LOOCH, Fr. A medicine of the consistence of honey, intended to be licked off a spoon. This form of medicine is well adapted to females and children, but is not much used in England at the present time. Those employed in modern pharmacy and prescribing are included under the heads CONFECTION, CONSERVE, or ELECTUARY.—The *dose*, when it is not otherwise stated, is a teaspoonful occasionally.

Linctus, Caca'o. *Syn.* LINCTUS CACAO, L.; CREME DE TRONCHIN, Fr. *Prep.* From cocoa-butter, 2 oz.; white sugar (in powder), syrup of capillaire, and syrup of tolu, of each, 1 oz.; mix. Demulcent and pectoral; in coughs, sore throats, hoarseness, &c.

Linctus, Common. *Prep.* From oil of almonds and syrup of tolu, of each, 1 oz.; powdered white sugar, 2 drs. As the last.

Linctus, Cough. *Syn.* PECTORAL LINCTUS; LINCTUS PECTORALIS, L. *Prep.* 1. (Dr. Latham.) Compound ipecacuanha powder (Dover's powder), ½ dr.; compound tragacanth powder, 2 drs.; syrup of tolu, confection of hips, and simple oxymel, of each, 1 oz.—*Dose.* 1 teaspoonful, 3 or 4 times a day. "This linctus has been extensively used, as a remedy for coughs, in the West-end of London, having been found to be a safe and generally efficacious remedy." (Redwood.) The preceding as well as the following are also useful preparations.

Linctus, Demul'cent. *Syn.* LINCTUS DEMULCENS, L.; LOOCH DE TRONCHIN, Fr. *Prep.* From oil of almonds, syrup of capillaire, manna, and cassia pulp, of each, 2 oz.; powdered gum tragacanth, 20 grs.; orange-flower water, 2 fl. oz. As the last. The above is the quantity for two days, which is as long as it will keep.

Linctus, Emol'lient. *Syn.* OILY EMULSION; LOHOCH OLEOSUM, EMULSIO OLEOSA, L.; LOOCH HUILEUX, Fr. *Prep.* (P. Cod.) Oil of almonds, powdered gum, and orange-flower water, of each, 4 drs.; syrup of marshmallow, 1 oz.; water, 3 fl. oz. or q. s.; for an emulsion. In troublesome coughs.

Linctus, Expec'torant. *Syn.* LINCTUS EXPECTORANS, LOHOCH E., L. *Prep.* 1. Oxymel of squills, confection of hips, syrup of marshmallow, and mucilage of gum arabic (thick), equal parts. Demulcent and expectorant.

2. (Dr. Copland.) Oil of almonds and syrup of lemons, of each, 1 fl. oz.; powdered ipecacuanha, 6 grs.; confection of hips, 1 oz.; compound powder of tragacanth, 3 drs.

3. (Zanetti.) Kermes mineral, 4 grs.; manna, 6 oz.; oil of almonds, syrup of squills, and syrup of senega, of each, 2 drs. Laxative, demulcent, and expectorant. The above are useful in hoarseness, tickling coughs, sore throats, &c.

Linctus, Pectoral. *Syn.* FOX LUNGS; LINCTUS PECTORALIS, LOHOCH È PULMONE VULPIUM, L. *Prep.* From spermaceti and Spanish juice, of each, 8 oz.; water, q. s. to soften the liquorice; make a thin electuary, and add of honey, 3 lbs.; oil of aniseed, 1 oz.; mix well. A popular and excellent demulcent in coughs. It formerly contained the herb 'fox lungs,' but spermaceti is now substituted for that article.

Linctus, Turpentine. *Syn.* LINCTUS STIMULANS, L. TEREBINTHINÆ, LOHOCH ANTHEL-

MINTICUM, L. *Prep.* (Recamier.) Oil of turpentine, 2 drs.; honey of roses, 3 oz.; mix. — *Dose.* A teaspoonful, night and morning, followed by a draught of any weak liquid; in worms, more especially tape-worm.

Linctus, White. *Syn.* LINCTUS ALBUS, MISTURA ALBA, LOHOCH ALBUM, L.; LOOCH BLANC, Fr. *Prep.* (P. Cod.) Jordan almonds, 4½ drs.; bitter almonds, ½ dr.; blanch them by steeping them in hot water and removing the skins; add of white sugar, ½ oz.; gum tragacanth, 20 grs.; beat to a smooth paste, and further add, of oil of almonds and orange-flower water, of each, 4 drs.; pure water 4 fl. oz. A pleasant demulcent in tickling coughs.

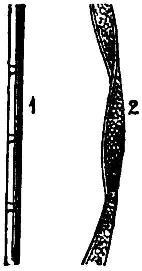
LIN'EN. *Syn.* LINTEUM, L. Linen is a textile fabric made of the liber-fibres of the *Linum usitatissimum*, or common flax, a plant which from time immemorial has been cultivated for this purpose. It is remarkable for the smoothness and softness of its texture, and is hence highly esteemed in temperate climates as an elegant and agreeable article of clothing to be worn next the skin. Its fibres are better conductors of heat, more porous, and more attractive of moisture, than those of cotton, which render it less adapted for body linen in cold weather, as well as in hot weather and hot climates, than calico. The latter, however, lacks the luxurious softness and freshness of linen, whilst the peculiar twisted and jagged character of its fibres render it apt to excite irritation in extremely delicate skins. The common prejudice in favour of old linen and flax lint for dressing wounds is thus shown to have reason on its side, and, like many other vulgar prejudices, to be supported by the investigations of science.

Identif. Linen fabrics are commonly sophisticated with cotton, which is a much less costly and a more easily wrought material. Various plans have been proposed to detect this fraud, many of which are too complicated and difficult for practical purposes. The following commend themselves for their simplicity and ease of application:—

1. A small strip (a square inch, for instance) of the suspected cloth is immersed for 2 or 3 minutes in a boiling mixture of about equal parts of hydrate of potassium and water, contained in a vessel of silver, porcelain, or hard glass; after which it is taken out and pressed between the folds of white blotting paper or porous calico. By separating 8 or 10 threads in each direction, their colour may be readily seen. The deep yellow threads are LINEN, the white or pale yellow ones are COTTON.

2. A small strip of the cloth, after having been repeatedly washed with rain water, boiled in the water, and dried, is immersed for 1 to 2 minutes in sulphuric acid; it is then withdrawn, carefully pressed under water with the fingers, washed, immersed for a few seconds in ammonia, solution of carbonate of ·ssium, or solution of carbonate of sodium, again washed with water, and dried between filtering paper. By this treatment the cotton fibres are dissolved, while the linen fibres are merely rendered thinner and more translucent, according to the duration of the experiment; after a short immersion, the cotton fibres appear transparent, while the linen fibres remain white and opaque.

3. (By the MICROSCOPE.) The indications afforded by both the previous tests, although quite visible to the naked eye, are rendered still more palpable by the use of a magnifying glass of small power, as the common pocket lens. Under a good microscope the presence of cotton in a linen tissue is very perceptible. The fibres of cotton present a distinctly flat and shrivelled appearance, not unlike that of a narrow, twisted ribbon, with only occasional joints; whilst those of flax are round, straight, and jointed. The fibres of cotton, after being exposed to the action of strong alkaline lyes, untwist themselves, contract in length, and assume a rounded form, but still continue distinct in appearance from the fibres of linen. The engraving represents a fibre of linen (1) and a fibre of cotton (2), as they appear when magnified 155 diameters. The difference between the two may be perceived, although less distinctly, through a good Stanhope or Coddington lens, provided the object be well illuminated.



Dyeing. Linen and cotton, from the similarity of their behaviour with dye-stuffs, are treated in nearly the same manner. The affinity of their fibres for colouring matter is very much weaker than that of the fibres of silk and woollen. On this account they are dyed with greater difficulty than those substances, and the colours so imparted are, in general, less brilliant and permanent under similar conditions. Linen shows less disposition to take dyes than cotton. The yarn or cloth, after being scoured and bleached in the usual manner, requires to have an additional tendency given to it, by chemical means, to condense and retain the materials of the dye-bath in its pores. This is effected by steeping the goods in solutions (mordants) which have at once an affinity for both the fibres of the cloth and the colouring matter. A similar process is employed in dyeing most other substances; but with cotton and linen, attention to this point is essential to the permanency of the dye. These matters are more fully explained under the heads DYEING and MORDANT.

The domestic management of linen may here receive a few moments' attention. Fruit stains, iron-moulds, and other spots on linen, may, in general, be removed by applying to the part, previously washed clean, a weak solution of chlorine, chloride of lime, spirits of salts, oxalic acid, or salts of lemons, in warm water, and frequently by merely using a little lemon juice. When the stain is removed, the part should be thoroughly rinsed in clear warm water (without soap) and dried. Recent iron-moulds or ink spots on starched linen, as the front of a shirt, may be conveniently removed by allowing a drop or two of melted tallow from a common candle to fall upon them before sending the articles to the laundress. The oxide of iron combines with the grease, and the two are washed out together. If the spot is not entirely removed the first time, the process should be repeated. Linen that has acquired a yellow or bad colour by careless washing, may be restored to its former whiteness by working it well in water to which some strained solution of chloride of lime has been added, observing to well rinse it in clean water, both before and after the immersion in the bleaching liquor. The attempt to bleach unwashed linen should be avoided, as also using the liquor too strong, as in that case the linen will be rendered rotten.

LING. The *Gadus molua* (Linn.), an inferior species of the cod-fish tribe, common in the Northern seas, and used as a coarse article of food by the poor.

LIN'IMENT. *Syn.* LINIMENTUM, L. A semifluid ointment, or soapy application to painful joints, swellings, burns, &c. The term is also occasionally extended to various spirituous and stimulating external applications. A medicine of a thinner consistence, but similarly employed, is called an 'EMBROCATION.' These terms are, however, frequently confounded together, and misapplied. Liniments are generally administered by friction with the hand or fingers, or with some substance (as a piece of flannel) capable of producing a certain amount of irritation of the skin. Sometimes a piece of linen rag dipped in them is simply laid on the part. In most cases in which liniments are found beneficial, the advantage obtained from them is attributable rather to the friction or local irritation than to any medicinal power in the preparation itself. The greater number of cerates and ointments may be converted into liniments by simply reducing their consistence with almond or olive oil, or oil of turpentine.

Liniment, Ac'id. *Syn.* LINIMENTUM ACIDUM, L. ACIDI SULPHURICI, L. *Prep.* 1. (Sir B. Brodie.) Salad oil, 3 oz.; oil of vitriol, 1 dr.; mix, then add of oil of turpentine, 1 oz., and agitate the whole well together. As a counter-irritant, in rheumatism, stiff joints, &c. It closely resembles the 'GUESTONIAN EMBROCATION.'

2. (Hosp. F.) Olive oil, 3 oz.; oil of turpentine, 2 oz.; sulphuric acid, 1 fl. dr. An excellent alterative, stimulant, discutient, and counter-irritant, in chronic rheumatism, stiff joints, indolent tumours, and various chronic diseases of the skin.

Linimentum Aconitii. (B. P.) Aconite root, in powder, 20; camphor, 1; rectified spirit, to percolate, 30. Moisten the root for 3 days, then pack in a percolator, and pour sufficient rectified spirit upon it to produce with the camphor 20.

Strength, 1 in 1. Applied with a camel-hair pencil, alone or mixed in equal proportions, with a soap liniment or compound camphor liniment, and rubbed on the part. 7 parts of this, and 1 part of chloroformum belladonna, and sprinkled thinly on impermeable piline, is the best application for neuralgia or lumbago.

Liniment of Am'ber-oil. *Syn.* LINIMENTUM SUCCINI, L. *Prep.* 1. From olive oil, 3 parts; oils of amber and cloves, of each, 1 part. Resembles 'ROCHE'S EMBROCATION.'

2. (Opiated; LINIMENTUM SUCCINI OPIATUM, L.) From rectified oil of amber and tincture of opium, of each, 2 fl. oz.; lard, 1 oz. Anodyne, antispasmodic, and stimulant. A once popular remedy in cramp, stiff joints, &c.

Liniment of Ammo''nia. *Syn.* AMMONIACAL LINIMENT, VOLATILE L., OIL AND HARTSHORN; LINIMENTUM AMMONIÆ (B. P., Ph. L. E. & D.), L. *Prep.* 1. (B. P.) Solution of ammonia, 1; olive oil, 3; mix.

2. (Ph. L. & E.) Liquor of ammonia (sp. gr. ·960), 1 fl. oz.; olive oil, 2 fl. oz.; shake them together until they are mixed.

3. (Ph. D.) To the last add of olive oil, 1 fl. oz. Stimulant and rubefacient. *Used* in rheumatism, lumbago, neuralgia, sore throat, spasms, bruises, &c. When the skin is irritable, more oil should be added, or it should be diluted with a little water.

4. (Camphorated; LINIMENTUM AMMONIÆ CAMPHORATUM, EMBROCATIO AMM. CAMPHORATA, L.)—*a.* (Hosp. F.) Olive oil, 3 oz.; camphor, ½ oz.; dissolve by a gentle heat, and when cold, add of liquor of ammonia, 1 fl. oz.

b. Soap liniment, 2 oz.; olive oil and liquor of ammonia, of each, 2 drs. As the last; more especially for sprains, bruises, chilblains, &c.

5. (Compound; DR. GRANVILLE'S COUNTER-IRRITANT OR ANTIDYNOUS LOTION; LINIMENTUM AMMONIÆ COMPOSITUM, L.—Ph. E.)—*a.* (STRONGER.) From liquor of ammonia (sp. gr. ·880), 5 fl. oz.; tincture of camphor, 2 fl. oz.; spirit of rosemary, 1 fl. oz.; mix. It should be kept in a well-stoppered bottle and in a cool situation.

b. (WEAKER.) Solution of ammonia (·880), 5 fl. oz.; tincture of camphor, 3 fl. oz.; spirit of rosemary, 2 fl. oz.

Obs. The above formulæ are nearly identical with the original ones of Dr. Granville; the principal difference being in his ordering liquor of ammonia of the sp. gr. ·872, instead of ·880. They are counter-irritant, rubefacient, vesicant, and cauterising, according to the mode and length of their application. The milder lotion is sufficiently powerful to produce considerable rubefaction and irritation in from 1 to 5 or 6 minutes; vesication, in 8 or 10 minutes; and cauterisation, in 4 or 5 minutes longer. For the latter purpose, the stronger lotion is generally employed. According to Dr. Granville, these lotions are prompt and powerful remedies in rheumatism, lumbago, cramp, neuralgia, sprains, swollen and painful joints, headache, sore throat, and numerous other affections in which the use of a powerful counter-irritant has been recommended. They are ordered to be applied by means of a piece of linen, 6 or 7 times folded, or a piece of thick, coarse flannel wetted with the lotion, the whole being covered with a thick towel, and firmly pressed against the part with the hand. The stronger lotion is only intended to be employed in apoplexy, and to produce cauterisation. See COUNTER-IRRITANTS.

6. (From SESQUICARBONATE OF AMMONIA;—LINIMENTUM AMMONIÆ SESQUICARBONATIS—Ph. L.) Solution of sesquicarbonate of ammonia, 1 fl. oz.; olive oil, 3 fl. oz.; shake them together until mixed. This preparation resembles ordinary liniment of ammonia in its general properties, but it is much less active, owing to the alkali being carbonated. It is the 'oil and hartshorn' and the 'volatile liniment' of the shops.

Liniment, An′odyne. See LINIMENTS OF BELLADONNA, MORPHIA, OPIUM, SOAP, &c.

Liniment, Antispasmod′ic. *Syn.* LINIMENTUM ANTISPASMODICUM, L. CAJEPUTI COMPOSITUM, L. *Prep.* (Hufeland.) Oils of cajeput and mint, of each, 1 part; tincture of opium, 3 parts; compound camphor liniment, 24 parts. Anodyne, stimulant, and rubefacient.

Liniment, Arceus's. Compound elemi ointment.

Liniment of Belladon′na. *Syn.* LINIMENTUM BELLADONNÆ, B.P. L. *Prep.* 1. (B.P.) Prepared the same as LINIMENTUM ACONITII. A fluid ounce is equal to a solid ounce. Prescribed with equal parts of soap liniment, or compound camphor liniment, and is an excellent topical application for neuralgic pain.

2. Extract of belladonna, 1 dr.; oil of almonds, 2 oz.; lime water, 4 fl. oz.; In eczema, and some other cutaneous affections, to allay irritation, &c.

3. (Cutan. Hosp.) Extract of belladonna, 4 drs.; glycerine, 1 oz.; soap liniment, 6 oz. As the last.

4. (Guy's Hosp.) Extract of belladonna, 1 oz.; soap liniment, 8 fl. oz.

5. (Phœbus.) Extract of belladonna, 40 grs.; rectified ether, 1 dr.; cherry-laurel water, 2 fl. oz. As a friction to the abdomen in lead colic.

Obs. The above are reputed excellent stimulants, anodynes, antispasmodics, and resolvents, in various diseases, as rheumatism, neuralgia, painful affections of the skin and joints, tumours, &c. &c.

Linimentum Calcis. (B. P.) Solution of lime, 1; olive oil, 1; mix. The best liniment for burns and scalds.

Liniment of Caj′eput Oil. *Syn.* LINIMENTUM OLEI CAJEPUTI, L. *Prep.* 1. (Dr. Copland.) Compound camphor liniment and soap liniment, of each, 1½ fl. oz.; oil of cajeput, 1 fl. oz.

2. (Dr. Williams.) Oil of cajeput, ½ fl. dr.; castor oil, 1 fl. dr.; olive oil, 4½ fl. drs. A warm, antispasmodic, diffusible stimulant and rubefacient; in spasmodic asthma, colic, chronic rheumatism, spasms, chest affections, &c. See ANTISPASMODIC L. (*above*).

Liniment of Cam′phor. *Syn.* CAMPHORATED OIL, CAMPHOR EMBROCATION; LINIMENTUM CAMPHORÆ (B. P., Ph. L. E. & D.), OLEUM CAMPHORATUM, L. *Prep.* 1. (B.P.) Camphor, 1; olive oil 4; dissolve.

2. (Ph. L. & E.) Camphor, 1 oz.; olive oil, 4 fl. oz.; gently heat the oil, add the camphor (cut small), and agitate until dissolved. The Dublin College orders only ½ the above camphor. Stimulant, anodyne, and resolvent; in sprains, bruises, rheumatic pains, glandular enlargements, &c.

3. (Compound; LINIMENTUM CAMPHORÆ COMPOSITUM—B. P., Ph. L. & D.)—*a.* (B. P.) Camphor, 5; English oil of lavender, ¼; strong solution of ammonia, 10; rectified spirit, 20. Dissolve the oil and camphor in the spirit and gradually add the ammonia.

b. (Ph. L.) Camphor 2½ oz.; oil of lavender, 1 fl. dr.; rectified spirit, 17 fl. oz.; dissolve, then add of stronger liquor of ammonia, 3 fl. oz., and shake them together until they are mixed.

c. (Ph. L. 1836.) Liquor of ammonia, 7½ fl. oz.; spirit of lavender, 1 pint; distil off 1 pint, and dissolve in it camphor, 2½ oz. The formula of the Ph. D. 1826 was nearly similar.

d. (Wholesale.) Camphor (clean), 21 oz.; English oil of lavender, 3¾ oz.; liquor of ammonia, 2¼ lbs.; rectified spirit, 7 pints; mix, close the vessel, and agitate occasionally, until the camphor is dissolved. Powerfully stimulant and rubefacient. It closely resembles, and is now almost universally sold for, Ward's 'Essence for the Headache.'

Liniment of Canthar′ides. *Syn.* LINIMENT OF SPANISH FLIES; LINIMENTUM LYTTÆ, LIN. CANTHARIDIS (Ph. D. & U. S.), L. *Prep.* 1. (Dr. Collier.) Tincture of cantharides and soap liniment, equal parts.

2. (Ph. D.) Cantharides (in fine powder), 3 oz.; olive oil, 12 fl. oz.; digest for 3 hours over a waterbath, and strain through flannel, with expression.

3. (Ph. U. S.) Spanish flies, 1 oz.; oil of turpentine, 8 fl. oz.; proceed as last. The above are irritant and rubefacient; but should be used cautiously, lest they produce strangury.

Liniment of Chlo″ride of Lime. *Syn.* LI-

NIMENTUM CALCIS CHLORINATÆ, L. *Prep.* 1. Chloride of lime, 1 dr.; water (added gradually), 3 fl. oz.; triturate together in a glass mortar for 10 minutes, pour off the liquid portion, and add of oil of almonds, 2 fl. oz.

2. (Kopp.) Solution of chloride of lime (ordinary), 1 part; olive oil, 2 parts.

3. (Waller.) Chloride of lime (in fine powder), 1 part; soft soap, 2 parts; soft water, q. s. to make a liniment.

Obs. The above are cleanly and excellent applications in itch, scald head, herpes, lepra, foul ulcers, &c.

Liniment of Chlo′′roform. *Syn.* LINIMENTUM CHLOROFORMI, B. P. *Prep.* 1. (B. P.) Chloroform, 1; liniment of camphor, 1; mix. The oil in the camphor liniment prevents the evaporation of the chloroform. Stimulating on application to a tender skin.

2. Chloroform 1 fl. dr.; almond oil, 7 fl. drs.; mix in a phial, and agitate it until the two unite.

3. (Tuson.) Chloroform, 1 fl. dr.; soap liniment, 2 fl. oz.; as the last. Used as an application in neuralgic pains, rheumatism, &c.

Liniment of Cod-liver Oil. *Syn.* LINIMENTUM OLEI MORRHUÆ, L. O. JACORIS ASELLI, L. *Prep.* (Dr. Brach.) Cod-liver oil, 2 fl. oz.; liquor of ammonia, 1 fl. oz.; mix. Resolvent, dispersive; applied to glandular tumours, scrofulous enlargements, &c.

Liniment of Cro′ton Oil. *Syn.* LINIMENTUM CROTONIS (B. P., Ph. D.), L. OLEI CROTONIS, L. O. TIGLII, L. *Prep.* 1. (B. P.) Croton oil, 1; oil of cajeput, 3½.; rectified spirit, 3½; mix.

2. (Ph. D.) Croton oil, 1 fl. oz.; oil of turpentine, 7 fl. oz.; mix by agitation.

3. (J. Allen.) Croton oil and liquor of potassa, of each, 1 fl. dr.; agitate until mixed, then add of rose water, 2 fl. oz.

4. (Pereira.) Croton oil, 1 part; olive oil, 5 parts.

Obs. The above are used as counter-irritants; in rheumatism, neuralgia, bronchial and pulmonary affections, &c. When rubbed on the skin, redness and a pustular eruption ensue, and in general the bowels are acted on.

Liniment, Diuret′ic. *Syn.* LINIMENTUM DIURETICUM, L. *Prep.* 1. (Dr. Calini.) Squills (in fine powder), 1 dr.; gastric juice of a calf, 2 oz.; mix.

2. (Dr. Christison.) Soap liniment, tincture of foxglove, and tincture of squills, equal parts. In dropsies; rubbed over the abdomen or loins twice or thrice a day.

Liniment, Emoll′ient. *Syn.* LINIMENTUM ALBUM, L. EMOLLIENS, L. *Prep.* From camphor, 1 dr.; Peruvian balsam, ½ dr.; oil of almonds, 1 fl. oz.; dissolve by heat, add of glycerin, ½ fl. oz., agitate well, and, when cold, further add of oil of nutmeg, 15 drops. Excellent for chopped hands, lips, nipples, &c.

Liniment of Gar′lic. *Syn.* LINIMENTUM ALLII, L. *Prep.* From juice of garlic, 2 parts; olive oil, 3 parts; mix. In hooping-cough, infantile convulsions, &c.

Liniment of Gin′ger. *Syn.* LINIMENTUM ZINGIBERIS, L. *Prep.* (Dr. Turnbull.) Ginger, 1 part; rectified spirit, 2 parts; make a tincture or essence. For short-sightedness. A few drops are occasionally rubbed on the forehead for 8 or 10 minutes at a time. How this tincture came to be called a liniment we are at a loss to determine.

Liniment, Hunga′′rian. *Syn.* LINIMENTUM HUNGARICUM, L. *Prep.* (Soubeiran.) Powdered cantharides and sliced garlic, of each, 1 dr.; camphor, bruised mustard seed, and black pepper, of each, 4 drs.; strong vinegar, 6 fl. oz.; rectified spirit, 12 fl. oz.; macerate a week, and filter. An excellent rubefacient and counter-irritant.

Liniment of Hydrochlo′′ric Acid. *Syn.* LINIMENTUM MURIATICUM, L. ACIDI MURIATICI, L. A. HYDROCHLORICI, L. *Prep.* 1. (Hosp. F.) Olive oil, 2 oz.; white wax, 2 drs.; dissolve by a gentle heat, add of balsam of Peru, 1 dr.; hydrochloric acid, 2 drs.; mix well. An excellent application to chilblains before they break.

2. (W. Cooley.) Olive oil, ½ pint; white spermaceti (pure) and camphor, of each, ½ oz.; mix with heat, add of hydrochloric acid, ½ fl. oz., and proceed as before. Equal to the last, and cheaper. This was extensively employed among the seamen of the Royal Navy by Mr. Cooley with uniform success.

Liniment of I′odide of Potas′sium. *Syn.* LINIMENTUM IODURETUM GELATINOSUM, L. GELÉE POUR LE GOÎTRE, Fr. *Prep.* (Foy.) Iodide of potassium, 4 drs.; proof spirit, 2 oz.; dissolve, and add the liquid to a solution of curd soap, 6 drs., in proof spirit, 2 oz., both being at the time gently warm; lastly, aromatise with rose or neroli, pour it into wide-mouthed bottles, and keep them closely corked. In goitre, &c.

Linimentum Potassii Iodidi cum Sapone. (B. P.) Hard soap, in powder, 1½; iodide of potassium, 1½; glycerin, 1; oil of lemon, ⅛: water, 1. Dissolve the soap in 7 of water, by heat of a water bath; dissolve the iodide of potassium in the remainder of the water, and mix by trituration the two solutions, and when cold add the oil of lemon, and mix thoroughly.

Liniment of I′odine. *Syn.* LINIMENTUM IODI (B. P.); IODURETTED LINIMENT; LINIMENTUM IODINII, L. IODURETUM, L. *Prep.* 1. (B. P.) Iodine, 5; iodide of potassium, 2; camphor, 1; rectified spirit, 40; dissolve.

2. (Cutan. Hosp.) Compound tincture of iodine and laudanum, equal parts.

3. (Dr. Copland.) Soap liniment, 1 oz.; iodine, 8 to 10 grs.

4. (Guibourt.) Iodide of potassium, 1 dr.; water, 1 fl. dr.; dissolve, and add it to white soap (in shavings) and oil of almonds, of each, 10 drs., previously melted together. Some perfume may be added. In scrofula, glandular enlargements, rheumatism, &c.

Liniment of Lead. *Syn.* LINIMENTUM LUMBI, L. *Prep.* (Gaozey.) Acetate of lead, 0 grs.; soft water, 12 fl. oz.; olive oil, 6 oz.; ix, and agitate well. Astringent and refrigeant. Useful in excoriations, especially when ccompanied with inflammation.

Liniment of Lime. *Syn.* LINIMENT FOR URNS, CARRON OIL; LINIMENTUM CALCIS Ph. L. E. & D.), L. AQUÆ CALCIS, OLEUM LINI UM CALCES, L. *Prep.* 1. From olive oil linseed oil—Ph. E.) and lime water, equal arts, shaken together until they are mixed. 'ery useful in burns and scalds.

2. (Compound; LINIMENTUM CALCIS COMOSITUM, L.)—*a.* (Camphorated—W. Cooley.) amphor liniment and lime water, equal parts.

b. (Opiated—W. Cooley.) Lime water and amphor liniment, of each, 1 oz.; extract of pium, 5 grs.; mix. Both are used as anodynes o allay pain and irritation in severe burns, hilblains, &c., for which purpose they are exellent. All the above liniments with lime ater should be used as soon as possible after eing prepared, as the ingredients separate by eeping.

Liniment of Mercury. *Syn.* MERCURIAL INIMENT; LINIMENTUM HYDRARGYRI (B. ., Ph. L.), LIN. H. COMPOSITUM (Ph. L. 1836), . *Prep.* 1. (B. P.) Ointment of mercury, ; solution of ammonia, 1; liniment of camhor, 1. Melt the ointment in the liniment, dd the ammonia, and shake them together.

2. (Ph. L.) Camphor, 1 oz.; spirit of wine, fl. dr.; sprinkle the latter on the former, owder, add of lard and mercurial ointment stronger), of each, 4 oz.; rub them well toether, then gradually add of liquor of amonia, 4 fl. oz.; and mix well. Stimulant nd discutient. It resembles mercurial ointent in its effects; but though milder in its peration, it more quickly produces salivation.

Liniment of Mor'phia. *Syn.* LINIMENTUM ORPHIÆ, L. *Prep.* (W. Cooley.) Pure morhia, 3 grs.; put it into a warm mortar, add ery gradually, of oil of almonds (warm), 1 . oz., and triturate until the morphia is disolved, then add of camphor liniment, 1 oz. n excellent topical anodyne and antispasodic, which often allays pain when other eans have failed.

Liniment of Mus'tard. *Syn.* LINIMENTUM INAPIS, L. *Prep.* 1. Flour of mustard (best), oz.; water, tepid, 2 fl. oz.; mix, and add of lycerin, liquor of ammonia, and olive oil, of ach, 1 fl. oz.

2. (Béral.) Carbonate of ammonia (in fine owder), 1 part; camphor (in powder), 2 arts; oil of lavender, 4 parts; tincture of ustard, 6 parts; mix, dissolve by agitation, dd of simple liniment (warm), 56 parts, and gain agitate until the whole is perfectly ncorporated.

3. Black mustard seed (ground in a pepperill or otherwise well bruised), ¼ lb.; oil of rpentine, 1 pint; digest, express the liquid, lter, and dissolve in it camphor, ¼ lb. Stimulant and rubefacient. A popular and useful remedy in rheumatic pains, lumbago, colic, chilblains, &c. The last is a close imitation of Whitehead's 'Essence of Mustard.'[1]

4. (LIN. OLEI VOLATILIS SINAPIS.)—*a.* From volatile oil of black mustard seed, ½ dr.; oil of almonds, 1 fl. oz. As a rubefacient.

b. From volatile oil, 1 part; alcohol (sp. gr. ·815), 1 to 2 parts. As a vesicant.

Liniment of Mustard (Compound). LINIMENTUM SINAPIS COMPOSITUM (B. P.). Oil of mustard, 1 dr.; etherial extract of mezereon, 40 grs.; camphor, 2 drs.; castor oil, 5 drs.; rectified spirit, 32 drs.; dissolve.

Liniment of Ni'trate of Mercury. *Syn.* CITRINE LINIMENT; LINIMENTUM HYDRARGYRI NITRATIS, L. *Prep.* (Sir H. Halford.) Ointment of nitrate of mercury and olive oil, equal parts, triturated together in a glass mortar, or mixed by a gentle heat. This liniment is stimulent, discutient, and alterative, and in its general properties resembles the ointment of the same name. For most purposes the quantity of oil should be at least doubled.

Liniment of Nux Vom'ica. *Syn.* LINIMENTUM NUCIS VOMICÆ, L. *Prep.* (Magendie.) Tincture of nux vomica, 1 fl. oz.; liquor of ammonia, 2 fl. drs.; mix. As a stimulating application to paralysed limbs. The addition of ½ fl. dr. each of glycerin and salad oil renders it an excellent application in chronic rheumatism and neuralgia.

Liniment of O'pium. *Syn.* ANODYNE LINIMENT; LINIMENTUM OPII (B. P., Ph. L. & E.), L. OPII or L. ANODYNUM (Ph. D.), L. SAPONIS CUM OPIO, L. *Prep.* 1. (B. P.) Tincture of opium, 1; liniment of soap, 1; mix.

2. Tincture of opium, 2 fl. oz.; soap liniment, 6 fl. oz.; mix.

3. (Ph. E.) Castile soap, 6 oz.; opium, 1¼ oz.; rectified spirit, 1 quart; digest for three days, then filter, add of camphor, 3 oz., oil of rosemary, 6 fl. drs., and agitate briskly.

4. (Ph. D.) Soap liniment and tincture of opium, equal parts.

5. (Wholesale.) Soft soap, 1½ lb.; powdered opium and camphor, of each ¼ lb.; rectified spirit, 1 gall.; digest a week.

Obs. This preparation is an excellent anodyne in local pains, rheumatism, neuralgia, sprains, &c.

Liniment of Phos'phorus. *Syn.* LINIMENTUM PHOSPHORATUM, L. *Prep.* (Augustin.) Phosphorus, 6 grs.; camphor, 12 grs.; oil of almonds, 1 oz.; dissolve by heat; when cold, decant the clear portion, and add of strongest liquor of ammonia, 10 drops. A useful friction in gout, chronic rheumatism, certain obstinate cutaneous affections, &c.

Sim'ple Liniment. *Syn.* LINIMENTUM SIMPLEX (Ph. E.), L. *Prep.* (Ph. E.) White wax, 1 oz.; olive oil, 4 fl. oz.; melt together, and stir the mixture until it is cold. Emollient; resembles spermaceti ointment in all except its consistence.

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[1] See page 462.

Liniment of Soap. *Syn.* OPODELDOC, CAMPHORATED TINCTURE OF SOAP, BALSAM OF S.; LINIMENTUM SAPONIS (B. P., Ph. L. E. & D.), L. SAPONACEUM, TINCTURA SAPONIS CAMPHORATA, BALSAMUM SAPONIS, L. *Prep.* 1. (B. P.) Hard soap (cut small), 2½ oz.; camphor, 1¼ oz.; English oil of rosemary, 3 drs.; rectified spirit, 18 oz.; distilled water, 2 oz.; mix the water and spirit, add the other ingredients, digest at a temperature not exceeding 70° Fahr., agitating occasionally for seven days, and filter.

2. (Ph. L.) Castile soap (cut small), 2½ oz.; camphor (small), 10 drs.; spirit of rosemary, 18 fl. oz.; water, 2 fl. oz.; digest with frequent agitation until the solid substances are dissolved.

3. (Ph. E.) Castile soap, 5 oz.; camphor, 2½ oz.; oil of rosemary, 6 fl. drs.; rectified spirit, 1 quart.

4. (Ph. D.) Castile soap (in powder), 2 oz.; camphor, 1 oz.; proof spirit, 16 fl. oz.

5. (LINIMENT SAVONNEAU—P. Cod.) Tincture of soap (P. Cod.) and rectified spirit (·863 or 41 o. p.), of each, 8 parts; olive oil, 1 part.

Obs. This article, prepared according to the directions of the Pharmacopœia, from 'soap made of olive oil and soda' (Castile soap), is apt to gelatinise in cold weather, and to deposit crystals of elaidate and stearate of lime. This may be avoided, when expense is not an objection, by first well drying the soap, employing a spirit of at least 85%, and keeping the preparation in well-closed bottles. A cheaper and better plan is to substitute the 'soft soap' of the Ph. L. ('soap made with olive oil and potassa') for the Castile soap ordered by the College. The soft soap of commerce imparts to the liniment an unpleasant smell. The following formula, one of those commonly adopted by the wholesale druggists, produces a very good article, though much weaker than that of the Pharmacopœia.

6. (Wholesale.) Camphor (cut small), 1½ lb.; soft soap, 7 lbs.; oil of rosemary, 3 fl. oz.; rectified spirit of wine and water, of each, 3½ galls.; digest with occasional agitation for a week, and filter. This is the 'opodeldoc' or 'soap liniment' of the shops.

Uses. Soap liniment is stimulant, discutient, and lubricating, and is a popular remedy in rheumatism, local pains, swellings, bruises, sprains, &c.

7. (With Opium.) See LINIMENT OF OPIUM.

8. (Sulphuretted; LINIMENTUM SAPONIS SULPHURETUM, L. SULPHURO-SAPONACEUM—Jadelot, L.) Sulphuret of potassium, 3 oz.; soap, 12 oz.; water, q. s.; melt together, and add, of olive oil, 12 oz.; oil of origanum, 1 fl. dr.; mix well. An excellent remedy for the itch, and some allied skin diseases.

Liniment of Sul'phide of Carbon. *Syn.* LINIMENTUM CARBONIS SULPHURETI, L. *Prep.* 1. From bisulphide of carbon, 1 dr.; camphorated oil, 1 oz.; mix.

2. (Lampadius.) Camphor, 2 drs.; bisulphuret of carbon, 4 fl. drs.; dissolve, and add of rectified spirit, 1 fl. oz. In rheumatism, gouty nodes, &c.

Liniment of Sulphu'ric Acid. See ACID LINIMENT.

Liniment, Tripharm'ic. *Syn.* LINIMENTUM TRIPHARMICUM (Ph. L. 1746), L. *Prep.* Take of lead plaster and olive oil, of each, 4 oz.; melt, add of strong vinegar, 1 fl. oz., and stir until cold. Cooling and desiccative; in excoriations, burns, &c.

Liniment of Tur'pentine. *Syn.* KENTISH'S LINIMENT; LINIMENTUM TEREBINTHINÆ (B. P., Ph. L. & D.), L. TEREBINTHINATUM (Ph. E.), L. *Prep.* 1. (B. P.) Oil of turpentine, 16; camphor, 1; soft soap, 2; dissolve the camphor in the turpentine, then add the soap, and rub till thoroughly mixed.

2. (Ph. L.) Soft soap, 2 oz.; camphor, 1 oz.; oil of turpentine, 10 fl. oz.; shake them together until mixed. Stimulant; in lumbago, cholera, colic, &c.

3. (Ph. L. 1824.) Resin cerate, 6 oz.; oil of turpentine, 4 fl. oz.; mix. An excellent application to burns.

4. (Ph. E.) Resin ointment, 4 oz.; camphor, 4 drs.; dissolve by a gentle heat, and stir in oil of turpentine, 5 fl. oz.

5. (Ph. D.) Oil of turpentine, 5 fl. oz.; resin ointment, 8 oz.; mix by a gentle heat. This forms Dr. Kentish's celebrated application to burns and scalds. The parts are first bathed with warm oil of turpentine or brandy, and then covered with pledgets of lint, smeared with the liniment.

6. (Compound—*a.* LINIMENTUM TEREBINTHINÆ ACETICUM.) Oil of turpentine, 1; acetic acid, 1; liniment of camphor, 1; mix.

b. (LINIMENTUM TEREBINTHINÆ COMPOSITUM, L.) (Acetic; ST. JOHN LONG'S LINIMENT; LINIMENTUM TEREBINTHINÆ ACETICUM, L.) Oil of turpentine, 3 oz.; rose water, 2½ fl. oz.; acetic acid, 5 drs.; oil of lemons, 1 dr.; yolk of egg, 1; make an emulsion. As a counter-irritant in phthisis.

c. (Ammoniated—Debreyne.) Lard, 3 oz.; melt, and add, of oil of turpentine and olive oil, of each, 1 oz.; when cold, further add of camphorated spirit, 4 fl. drs.; liquor of ammonia, 1 fl. dr. In sciatica, lumbago, &c.

d. (Opiated—Recamier.) Oil of turpentine, 1 fl. oz.; oil of chamomile, 2 fl. oz.; tincture of opium, 1 fl. dr. In neuralgia, &c.

e. (Sulphuric—Ph. Castr. Ruthena.) Oil of turpentine, 2 oz.; olive oil, 5 oz.; mix, and add of dilute sulphuric acid, 1½ dr. See ACID LINIMENT.

Liniment of Vera'trine. *Syn.* LINIMENTUM VERATRIÆ, L. *Prep.* (Brande.) Veratrine, 8 grs.; alcohol, ½ fl. oz.; dissolve, and add of soap liniment, ½ fl. oz. In neuralgic and rheumatic pains, gout, &c.

Liniment of Ver'digris. *Syn.* OXYMEL OF VERDIGRIS; LINIMENTUM ÆRUGINIS (Ph. L.), OXYMEL ÆRUGINIS (Ph. L. 1738), OXYMEL CUPRI SUBACETATIS (Ph. D. 1826), L. *Prep.* (Ph. L.) Verdigris (in powder), 1 oz.; vinegar, 7 fl. oz.; dissolve, filter through linen, add of honey, 14 oz., and evaporate to a proper consistence.

Obs. This preparation is wrongly named a 'liniment.' The College, after 'beating about the bush' for nearly a century, found a right name for it in 1788; but, as in many other cases, soon abandoned it for another less appropriate.

Oxymel of verdigris is stimulant, detergent, and escharotic. It is applied to indolent ulcers, especially of the throat, by means of a camel-hair pencil; and, diluted with water, it is used as a gargle. Care must be taken to avoid swallowing it, as it occasions vomiting and excessive purging.

Liniment, Ver′mifuge. *Syn.* LINIMENTUM ANTHELMINTICUM, L. VERMIFUGUM, L. *Prep.* Castor oil, 1 oz.; essential oils of wormwood and tansy, of each, ½ oz.; Dr. Peschier's ethereal tincture of pennyroyal buds, 20 drops; mix. Employed in frictions on the abdomen in cases of worms in children. Its activity may be still further increased by the addition of a little garlic juice. ('Journ. de Méd.') An excellent medicine.

Liniment, Ware's. *Prep.* From camphor liniment, 1 oz.; solution of carbonate of potassa, 1 dr. In amaurosis.

Liniment, White's. The old name for spermaceti ointment.

Liniment, Wilkinson's. *Prep.* (Phœbus.) Prepared chalk, 20 grs.; sulphur, lard, and tar, of each, ½ oz.; mix, and add of Boyle's fuming liquor, 10 or 15 drops. In certain chronic skin diseases, neuralgia, &c.

LIN′SEED. *Syn.* FLAX SEED; LINI SEMINA, L. The seed of *Linum usitatissimum* (Linn.), or common flax. (Ph. L.) Oily, emollient, demulcent, and nutritive. Ground to powder (linseed meal; farina lini), it is used for poultices. The cake left after expressing the oil (linseed cake; lini placenta) is used for feeding cattle. Under the form of tea or infusion, it is used as a diluent, and to allay irritation in bronchial, urinary, and other like affections. See INFUSION, LINEN, &c.

LINT. *Syn.* LINTEUM, L. White linen-cloth, scraped by hand or machinery, so as to render it soft and woolly. The hand-made lint is now little used; it was prepared from pieces of old linen-cloth. The machine-made lint is prepared from a fabric woven on purpose. A lint made from cotton (cotton-lint) is now largely manufactured; it is much inferior to the true lint, being a bad conductor of heat. Lint is used for dressing ulcers, either alone or smeared with some suitable ointment or cerate.

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2. From nitrate of silver and nitrate of copper, of each, ½ dr.; lint, 1 oz.; water, 1½ fl. oz.; as the last. Used to dress old and indolent ulcers.

LIP SALVE. See SALVE.

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LIQUEFAC′TION. The assumption of the liquid form. It is usually applied to the conversion of a solid into the liquid state, which may arise from increase of temperature (fusion), absorption of water from the atmosphere (deliquescence), or the action of a body already fluid (solution).

Liquefaction of Gases. Under the combined influence of pressure and cold, nearly all the gases may be liquefied. The first experiments in this direction were made by Faraday, who succeeded in reducing to the liquid condition 8 bodies which had hitherto been regarded as permanent gases, namely, ammonia, carbonic anhydride, chlorine, cyanogen, hydrochloric acid, nitrous oxide, sulphuretted hydrogen, and sulphurous anhydride. His method of proceeding was very simple; the materials were sealed up in a strong, narrow, glass tube, bent so as to form an obtuse angle, together with a little 'pressure gauge,' consisting of a slender tube closed at one end, and having within it, near the open extremity, a globule of mercury. The gas, being disengaged by the application of heat or otherwise, accumulated in the tube, and by its own pressure brought about liquefaction. The force required for this purpose was judged of by the diminution of volume of the air in the pressure gauge. By employing powerful condensing syringes, and an extremely low temperature, Faraday has since succeeded in liquefying olefiant gas, hydriodic and hydrobromic acids, phosphuretted hydrogen, and the gaseous fluorides of silicon and boron. Oxygen, hydrogen, nitrogen, nitric oxide, carbonic oxide, and coal gas, refused to liquefy at the temperature of —166° Fahr., while subjected to pressures varying in different cases from 27 to 58 atmospheres. Since then an even greater degree of cold has been obtained from liquefied nitric oxide and ether.

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large scale by condensing it in strong vessels of gun-metal or boiler-plate. It requires a pressure of between 27 and 28 atmospheres at 32° Fahr. (Adams.) The liquefied acid is colourless and limpid, lighter than water, and four times more expansible than air; it mixes in all proportions with ether, alcohol, naphtha, oil of turpentine, and sulphuret of carbon; and is insoluble in water and fat oils. When a jet of liquid carbonic anhydride is allowed to issue into the air from a narrow aperture, such an intense degree of cold is produced by the evaporation of a part, that the remainder freezes to a solid (solid carbonic anhydride), and falls in a shower of snow. This substance, which may be collected, affords a means of producing extreme cold. Mixed with a little ether, and poured upon a mass of mercury, the latter is almost instantly frozen. The temperature of this mixture in the air was found to be —106° Fahr.; when the same mixture was placed beneath the receiver of an air-pump, and exhaustion rapidly performed, the temperature sank to —166°. This degree of cold was employed in Faraday's last experiments on the liquefaction of gases.

LIQUEUR. [Fr.] *Syn.* CORDIAL. A stimulating beverage, formed of weak spirit, aromatised and sweetened. The manufacture of liqueurs constitutes the trade of the 'compounder,' 'rectifier,' or 'liquoriste.'

The materials employed in the preparation of liqueurs or cordials are rain or distilled water, white sugar, clean flavourless spirit, and flavouring ingredients. To these may be added the substances employed as 'finings,' when artificial clarification is had recourse to.

The utensils and apparatus required in the business are those ordinarily found in the wine and spirit cellar; together with a copper still, furnished with a pewter head and a pewter worm or condenser, when the method 'by distillation' is pursued. A barrel, hogshead, or rum puncheon, sawn in two, or simply 'unheaded,' as the case may demand, forms an excellent vessel for the solution of the sugar; and 2 or 3 fluted funnels, with some good white flannel, will occasionally be found useful for filtering the aromatic essences used for flavouring. Great care is taken to ensure the whole of the utensils, &c., being perfectly clean and 'sweet,' and well 'seasoned,' in order that they may neither stain nor flavour the substances placed in contact with them.

In the preparation or compounding of liqueurs, one of the first objects which engages the operator's attention is the production of an alcoholic solution of the aromatic principles which are to give them their peculiar aroma and flavour. This is done, either by simple solution or maceration, as in the manufacture of tinctures and medicated spirits, or by maceration and subsequent distillation. The products, in this country, are called ESSENCES or SPIRITS, and by the French INFUSIONS, and are added to the solution of sugar (SYRUP or CAPILLAIRE) or to the dulcified spirit, in the proportions required. Grain or molasses spirit is the kind usually employed for this purpose in England. As before observed, it should be of the best quality; as, if this is not the case, the raw flavour of the spirit is perceptible in the liquor. Rectified spirit of wine is generally very free from flavour, and when reduced to a proper strength with clear soft water, forms a spirit admirably adapted for the preparation of cordial liquors. Spirit weaker than about 45 o. p., which has been freed from its own essential oil, by careful rectification, is known in trade under the title of 'pure,' 'flavourless,' 'plain,' or 'silent spirit.' Before macerating the ingredients, if they possess the solid form, they are coarsely pounded, bruised, sliced, or ground, as the peculiar character of the substance may indicate. This is not done until shortly before submitting them to the action of the menstruum; as, after they are bruised they rapidly lose their aromatic properties by exposure to the air. When it is intended to keep them for any time in the divided state, they should be preserved in well-corked bottles or jars. The practice of drying the ingredients before pounding them, frequently adopted by ignorant and lazy workmen, for the sake of lessening the labour, is, of course, even more destructive to their most valuable qualities than mere exposure to the air. The length of time the ingredients should be digested in the spirit should never be less than 5 or 6 days, but a longer period is preferable when distillation is not employed. In either case the time may be advantageously extended to 10 days or a fortnight, and frequent agitation should be had recourse to during the whole period. When essential oils are employed to convey the flavour, they are first dissolved in a little of the strongest rectified spirit of wine, in the manner explained under ESSENCE; and when added to the spirit, they are mixed up with the whole mass as rapidly and as perfectly as possible. In managing the still, the fire is proportioned to the ponderosity of the oil or flavouring substance, and the receiver is changed before the faints come over; as these are unfitted to be mixed with the cordial. In many cases the addition of a few pounds of common salt to the liquor in the still facilitates the process and improves the product. Ingredients which are not volatile are, of course, always added after distillation. The stronger spirit is reduced to the desired strength by means of either clear soft water or the clarified syrup used for sweetening. The sugar employed should be of the finest quality, and is prererably made into capillaire or syrup before adding it to the aromatised spirit; and not until this last has been rendered perfectly 'fine' or transparent, by filtration or clarification, as the case may demand. Some spirits or infusions, as those

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The utensils and apparatus required in the business are those ordinarily found in the wine and spirit cellar; together with a copper still, furnished with a pewter head and a pewter worm or condenser, when the method 'by distillation' is pursued. A barrel, hogshead, or rum puncheon, sawn in two, or simply 'unheaded,' as the case may demand, forms an excellent vessel for the solution of the sugar; and 2 or 3 fluted funnels, with some good white flannel, will occasionally be found useful for filtering the aromatic essences used for flavouring. Great care is taken to ensure the whole of the utensils, &c., being perfectly clean and 'sweet,' and well 'seasoned,' in order that they may neither stain nor flavour the substances placed in contact with them.

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aniseed, caraway, &c., more particularly quire this treatment, which is best performed ' running them through a clean wine bag, ade of rather fine cloth, having previously ixed them with a spoonful or two of mag-sia; but in all cases clarification by simple pose should be preferred. Under proper anagement, liqueurs or cordials prepared of od materials will be found perfectly 'clear' 'bright' as soon as made, or will become so ter being allowed a few days for defecation; it in the hands of the inexperienced operator, ıd when the spirit employed is insufficient in rength or quantity, it often happens that ey turn out 'foul' or 'milky.' When this the case, the liquid may be 'fined down' th the whites of 12 to 20 eggs per hogshead; a little alum, either alone or followed by a tle carbonate of sodium or potassium, both ssolved in water, may be added, in the anner described under FININGS.

An excellent and easy way of manufacturing rdial liquors, especially when it is inconve-ent to keep a large stock on hand, is by nply 'aromatising' and 'colouring,' as cir-ımstances or business may demand, spirit 60 64 u. p., kept ready sweetened for the pur-se. To do this to the best advantage, two scriptions of sweetened spirit should be pro-ded, containing respectively 1 lb. and 3 lbs. sugar to the gallon. From these, spirit of y intermediate sweetness may be made, hich may be flavoured with any essential oil ssolved in alcohol, or any aromatised spirit or nfusion' (see *below*), prepared either by di-stion or distillation. As a general rule, the ncentrated essences, made by dissolving 1 oz. the essential oil in 1 pint of the strongest ctified spirit of wine, will be found admirably lapted for this purpose. These essences, hich should be kept in well-corked bottles, e employed by dropping them cautiously to the sweetened spirit until the desired fla-ur is produced. During this operation, the quor should be frequently and violently aken to produce complete admixture. If any accident the essence is added in too rge a quantity, the resulting 'milkiness' or cess of flavour may be removed by the ad-tion of a little more spirit, or by clarifica-on. In this way the majority of the liqueurs common use may be produced extempo-neously, of nearly equal quality to those epared by distillation. For those which are loured, simple digestion of the ingredients almost universally adopted. The "process distillation" should, however, be always nployed to impart the flavour and aroma of latile aromatics to the spirit, when expense, bour, and time, are of less importance than e production of a superior article.

The French liquoristes are famed for the pre-ıration of cordials of superior quality, cream-ke smoothness, and delicate flavour. Their ccess chiefly arises from the employment of ry pure spirit and sugar (the former in a larger proportion than that adopted by the English compounder), and in the judicious application of the flavouring ingredients. The French liquoristes distinguish their cordials as 'eaux' and 'extraits' (waters, extracts), or liqueurs which, though sweetened, are entirely devoid of viscidity; and 'baumes,' 'crêmes,' and 'huiles' (balms, creams, oils), which contain sufficient sugar to impart to them a syrupy consistence. The greatest possible attention is given to the preparation of the aromatised or flavouring essences, in France called 'infusions.' These are generally made by macerating the aromatic ingredients in spirit at about 2 to 4 u. p. (sp. gr. ·922 to ·925), placed in well-corked glass carboys, or stoneware jars or bottles. The maceration is continued, with occasional agitation, for 3, 4, or even 5 weeks, when the aromatised spirit is either distilled or filtered; generally the former. The outer peel of cedrats, lemons, oranges, limettes, bergamottes, &c., is alone used by our Continental neighbours, and is obtained either by carefully peeling the fruit with a knife, or by 'oleo-saccharum,' by rubbing it off with a lump of hard white sugar. Aromatic seeds and woods are bruised by pounding before being submitted to infusion. The substances employed in France to colour liqueurs are, for—blue, soluble Prussian blue, sulphate of indigo (nearly neutralised with chalk), and the juice of blue flowers and berries;—amber, fawn, and brandy colour, burnt sugar or spirit colouring;—green, spinach or parsley leaves (digested in spirit), and mixtures of blue and yellow;—red, powdered cochineal or brazil wood, either alone or mixed with a little alum;—violet, blue violet petals, litmus, or extract of logwood;—purple, the same as violet, only deeper;—yellow, an aqueous infusion of safflower or French berries, and the tinctures of saffron and turmeric.

A frequent cause of failure in the manfacture of liqueurs and cordials is the addition of too much flavouring matter. Persons unaccustomed to the use of strong aromatic essences and essential oils, seldom sufficiently estimate their power, and, consequently, are very apt to add too much of them, by which the liqueur is rendered not only disagreeably high flavoured, but, from the excess of oil present, also 'milky,' or 'foul,' either at once, or, what is nearly as bad, on the addition of water. This source of annoyance, arising entirely from bad manipulation, frequently discourages the tyro, and cuts short his career. as a manufacturer. From the viscidity of cordials, they are less readily 'fined down' than unsweetened liquor, and often give much trouble to clumsy and inexperienced operators. The most certain way to prevent disappointment in this respect is to use too little rather than too much flavouring; for if the quantity proves insufficient, it is readily 'brought up' at any time, but the contrary is not effected without some trouble and delay.

A careful attention to the previous remarks will render this branch of the rectifier's art far more perfect and easy of performance than it is at present, and will, in most cases, produce at once a satisfactory article, 'fine, sweet, and pleasant.'

The cordials of respectable British 'compounders' contain fully 3 lbs. of white lump sugar per gallon, and are of the strength of 60 to 64 u. p. The baumes, crêmes, and huiles imported from the Continent are richer both in spirit and sugar than ours, and to this may be referred much of their superiority. Mere sweetened or cordialised spirits (eaux, of the Fr.) contain only from 1 to 1½ lb. of sugar per gallon.

The purity of liqueurs is determined in the manner noticed under BRANDY, WINE, &c.

The following list embraces nearly all the cordials and liqueurs, both native and imported, met with in trade in this country:—

Absinthe. *Syn.* EXTRAIT D'ABSINTHE DE SUISSE; SWISS EXTRACT OF WORMWOOD. *Prep.* From the tops of *Absinthum majus*, 4 lbs.; tops of *Absinthum minus*, 2 lbs.; angelica root, calamus aromaticus, Chinese aniseed, and leaves of dittany of Crete, of each, 15 grs.; brandy or spirit at 12 u. p., 4 galls.; macerate for 10 days, then add water, 1 gall.; distil 4 galls. by a gentle heat, and dissolve in the distilled spirit, of crushed white sugar, 2 lbs. Tonic and stomachic.

Alker'mes. This liqueur is highly esteemed in some parts of the South of Europe.

Prep. 1. Bay leaves and mace, of each 1 lb.; nutmegs and cinnamon, of each 2 oz.; cloves, 1 oz. (all bruised); cognac brandy, 3½ galls.; macerate for 3 weeks, frequently shaking, then distil over 3 galls., and add, of clarified spirit of kermes, 18 lbs.; orange-flower water, 1 pint; mix well, and bottle. This is the original formula for the 'alkermes de Santa Maria Novella,' which is much valued.

2. Spice, as last; British brandy, 4 galls.; water, 1 gall.; macerate as before, and draw over 4 galls., to which add, of capillaire, 2 galls., and sweet spirit of nitre, ¼ pint. Cassia is often used for cinnamon. Inferior to the last.

An'iseed Cordial. *Prep.* 1. From aniseed, 2 oz. (or essential oil, 1½ dr.), and sugar, 3 lbs. per gallon. It should not be weaker than about 45 u. p., as at lower strengths it is impossible to produce a full-flavoured article without its being milky, or liable to become so.

2. (ANISETTE DE BORDEAUX.)—*a.* (Foreign.) Aniseed, 4 oz.; coriander and sweet fennel seeds, of each, 1 oz. (bruised); rectified spirit, ½ gall.; water, 3 quarts; macerate for 5 or 6 days, then draw over 7 pints, and add of lump sugar, 2½ lbs.

b. (English.) Oil of aniseed, 15 drops; oils of cassia and caraway, of each, 6 drops; rub them with a little sugar, and then dissolve it in spirit (45 u. p.), 3 quarts, by well shaking them together; filter, if necessary, and dissolve in the clear liquor sugar, 1½ lb. See PEPPERMINT (*below*).

Balm of Moluc'ca. *Prep.* From mace, 1 dr.; cloves, ½ oz.; clean spirit (22 u. p.), 1 gall.; infuse for a week in a well-corked carboy or jar, frequently shaking, colour with burnt sugar, q. s., and to the clear tincture add of lump sugar, 4½ lbs., dissolved in pure soft water, ½ gall. On the Continent this takes the place of the 'cloves' of the English retailer.

Bit'ters. These have generally from 1 to 1½ lb. of sugar per gallon.[1]

Car'away Cordial. *Prep.* Generally from the essential oil, with only 2½ lbs. of sugar per gall. 1 fl. dr. of the oil is commonly reckoned equal to ¼ lb. of the seed. The addition of a very little oil of cassia, and about half as much of essence of lemon or of orange, improves it. See BRANDY (Caraway).

Ce'drat Cordial. *Prep.* From essence (oil) of cedrat, ¼ oz.; pure spirit (at proof), 1 gall.; dissolve, add of water, 3 pints, agitate well; distil 3 quarts, and add an equal measure of clarified syrup. A delicious liqueur. See CRÊME and EAU (*below*).

Cin'namon Cordial. *Prep.* This is seldom made with cinnamon, owing to its high price, but with either the essential oil or bark of cassia, with about 2 lbs. of sugar to the gall. It is preferred coloured, and therefore may be very well prepared by simple digestion. The addition of 5 or 6 drops, each, of essence of lemon and orange peel, with about a spoonful of essence of cardamoms per gall., improves it. 1 oz. of oil of cassia is considered equal to 8 lbs. of the buds or bark. 1 fl. dr. of the oil is enough for 2½ galls. It is coloured with burnt sugar.

Cit'ron Cordial. *Prep.* From the oil or peel, with 3 lbs. of sugar per gall., as above. (See *below*.)

Citronelle. *Syn.* EAU DE BARBADES. *Prep.* 1. From fresh orange peel, 2 oz.; fresh lemon peel, 4 oz.; cloves, ½ dr.; corianders and cinnamon, of each, 1 dr.; proof spirit, 4 pints; digest for 10 days, then add of water, 1 quart, and distil ½ gall.; to the distilled essence add of white sugar, 2 lbs., dissolved in water, 1 quart.

2. Essence of orange, ½ dr.; essence of lemon, 1 dr.; oil of cloves, and cassia, of each, 10 drops; oil of coriander, 20 drops; spirit (58 o. p.), 5 pints; agitate until dissolved, then add of distilled or clear soft water, 3 pints; well mix, and filter it through blotting paper, if necessary; lastly, add of sugar (dissolved), q. s.

Clairet. *Syn.* ROSSALIS DES SIX GRAINES. *Prep.* From aniseed, fennel seed, coriander seed, caraway seed, dill seed, and seeds of the candy-carrot (*Athamantia cretensis*—Linn.), of each (bruised), 1 oz.; proof spirit, ½ gall.; digest for 1 week, strain, and add of loaf sugar, 1 lb., dissolved in water, q. s.

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[1] See article, BITTERS.

Cloves. *Syn.* CLOVE CORDIAL. *Prep.* From bruised cloves, 1 oz., or essential oil, 1 fl. dr., to every 3 galls. of proof spirit. If distilled, some common salt should be added, and it should be drawn over with a pretty quick fire. It requires fully 3 lbs. of sugar per gall., and is generally coloured with poppy flowers or burnt sugar. The addition of 1 dr. of bruised pimento, or 5 drops of the oil for every oz. of cloves, improves this cordial. See BALM OF MOLUCCA (*above*).

Coriander Cordial. *Prep.* From corianders, as the last. A few sliced oranges improve it.

Crême d'Anis. As ANISEED CORDIAL, only richer.

Crême des Barbades. As CITRONELLE, adding some of the juice of the oranges, and an additional lb. of sugar per gall.

Crême de Cacao. *Prep.* Infuse roasted caracca cacao nuts (cut small), 1 lb., and vanila, ½ oz., in brandy, 1 gall., for 8 days; strain, and add of thick syrup, 3 quarts.

Crême de Cedrat. *Syn.* HUILE DE CEDRAT. *Prep.* From spirit of citron, 1 pint; spirit of cedrat, 1 quart; proof spirit, 3 quarts; white sugar, 16 lbs., dissolved in pure soft water, 2 galls.

Crême de Macarons. *Prep.* 1. From cloves, cinnamon, and mace, of each (bruised), 1 dr.; bitter almonds (blanched and beaten to a paste), 7 oz.; spirit (17 u. p.), 1 gall.; digest a week, filter, and add of white sugar, 6 lbs., dissolved in pure water, 2 quarts.

2. Clean spirit (at 24 u. p., sp. gr. ·915), 2 galls.; bitter almonds, ¾ lb.; cloves, cinnamon, and mace, of each, in coarse powder, 1½ dr.; infuse for 10 days, filter, and add of white sugar, 8 lbs., dissolved in pure water, 1 gall.; lastly, give the liqueur a violet tint with infusion or tincture of litmus and cochineal. An agreeable, nutty-flavoured cordial, but, from containing so much bitter almonds, should be only drank in small quantities at a time. The English use only one half the above quantity of almonds.

Crême de Naphe. *Prep.* From sweetened spirit (60 u. p.) containing 3½ lbs. of sugar per gall., 7 quarts; orange-flower water (foreign), 1 quart. Delicious.

Crême de Noyeau. See NOYEAU.

Crême d'Orange. *Prep.* From oranges (sliced), 3 dozen; rectified spirit, 2 galls.; digest for 14 days; add, of lump sugar, 28 lbs. (previously dissolved in water, 4½ galls.); tincture of saffron, 1½ fl. oz.; and orange-flower water, 2 quarts.

Crême de Portugal. Flavoured with lemon, to which a little oil of bitter almonds is added.

Curaçao. *Prep.* From sweetened spirit (at 56 u. p.), containing 3½ lbs. of sugar per gall., flavoured with a tincture made by digesting the 'oleo-saccharum' prepared from Seville oranges, 9 in number; cinnamon, 1 dr.; and mace, ¾ dr., in rectified spirit, 1 pint. It is coloured by digesting in it for a week or 10 days Brazil-wood (in powder), 1 oz., and afterwards mellowing the colour with burnt sugar, q. s.

Delight of the Mandarins. From spirit (22 u. p.), 1 gall.; pure soft water, ½ gall.; white sugar (crushed small), 4½ lbs.; Chinese aniseed and ambrette or musk seed, of each (bruised), ½ oz.; safflower, ¼ oz.; digested together in a carboy or stone bottle capable of holding double, and agitated well every day for a fortnight.

Eau de Cedrat. *Syn.* CEDRAT WATER. As CRÊME DE CEDRAT, but using less sugar.

Eau de Chasseurs. See PEPPERMINT (*below*).

Eau de Vie d'Andaye. *Syn.* EAU DE VIE D'ANIS; ANISEED LIQUEUR BRANDY. *Prep.* From brandy or proof spirit, 1 gall.; sugar, ¾ lb.; dissolved in aniseed water, 1 pint.

Gold Cordial. *Prep.* From angelica root (sliced), 1 lb.; raisins, ½ lb; coriander seeds, 2 oz.; caraway seeds and cassia, of each, 1½ oz.; cloves, ½ oz.; figs and sliced liquorice root, of each, 4 oz.; proof spirit, 3 galls.; water, 1 gall.; digest 2 days, and distil 3 gallons by a gnetle heat; to this add of sugar, 9lb., dissolved in rose water and clean soft water, of each, 1 quart; lastly, colour the liquid by steeping in it of hay saffron, 1¼ oz. This cordial was once held in much esteem. It derives its name from a small quantity of gold leaf being formerly added to it.

Huile d'Anis. See CRÊME D'ANIS (*above*).

Huile de Vanille. Flavoured with essence or tincture of vanilla. It is kept in a decanter, and used to flavour liqueurs, grog, &c.

Huile de Venus. *Prep.* From the flowers of the wild carrot, 2½ oz., and sugar, 3 lbs. to the gal. It is generally coloured by infusing a little powdered cochineal in it.

Jargonelle. *Syn.* JARGONELLE CORDIAL. Flavoured with essence of jargonelle pear (acetate of amyl). Pine-apple cordial and liqueurs from some other fruits are also prepared from the new fruit essences. See ESSENCE.

Lem'on Cordial. *Prep.* Digest fresh and dried lemon peel, of each 2 oz., and fresh orange peel, 1 oz., in proof spirit, 1 gal., for a week; strain with expression, add of clear soft water, q. s. to reduce it to the desired strength, and lump sugar, 3 lbs. to the gallon. The addition of a little orange-flower or rose water improves it.

Liquodilla. Flavoured with oranges and lemons, of each, sliced, 3 in number; with sugar, 2½ lbs. per gal.

Lov'age Cordial. *Prep.* From the fresh roots of lovage, 1 oz. to the gallon. A fourth of this quantity of the fresh roots of celery and sweet fennel are also commonly added. In some parts a little fresh valerian root and oil of savine are added before distillation. It is much valued by the lower classes in some of the provinces for its stomachic and emmenagogue qualities.

Oil of Ce'drat. See CRÊME DE CEDRAT (*above*).

O'range Cordial. Like LEMON CORDIAL or

CREME D'ORANGE, from fresh orange peel, ¼ lb. to the gallon.

Parfait Amour. *Syn.* PERFECT LOVE. *Prep.* Flavoured with the yellow rind of 4 lemons, and a teaspoonful of essence of vanilla to the gallon, with sugar, 3 lbs., and powdered cochineal, q. s. to colour.

Pep'permint. *Syn.* PEPPERMINT CORDIAL, SPORTSMAN'S C., X. MINT; EAU DE CHASSEURS, Fr. This well-known compound is in greater demand in every part of the kingdom than all the other cordials put together.

Prep. 1. From peppermint water and gin or plain spirit (22 u. p.), of each, 1 pint; lump sugar, ¾ lb.

2. (Wholesale.) English oil of peppermint, 5 oz., is added to rectified spirit of wine, 3 pints, and the mixture is agitated well together for some time in a corked bottle capable of holding 4 pints or more; it is then emptied into a cask having a capacity of upwards of 100 galls., and perfectly white and flavourless proof spirit, 36 galls., is poured in, and the whole well agitated for 10 minutes; a solution of the best double refined lump sugar, 2¾ cwt., in about 35 galls. of pure filtered rain water, is then added, and the contents of the cask well 'rummaged up,' in the usual manner, for at least 15 minutes; sufficient clear rain water to make up the whole quantity to exactly 100 gallons, and holding in solution alum, 5 oz., is next added, and the whole is again well agitated for at least a quarter of an hour, after which the cask is bunged down, and allowed to repose for a fortnight before it is 'broached' for sale.

Obs. The last formula produces a beautiful article, provided the ingredients are of good quality. Care on this point is particularly necessary in reference to the essential oil, which should only be purchased of some known respectable dealer. The sugar should be sufficiently pure to dissolve in a wine-glassful of clear soft water without injuring its transparency, and the cask should be a fresh-emptied gin pipe, or one properly prepared for gin, as, if it gives colour, it will spoil the cordial. When these particulars are attended to, the product is a bright transparent liquor as soon as made, and does not require fining. Should there be the slightest opacity, the addition of 2 oz. of salt of tartar, dissolved in a quart of hot water, will have the effect of "clearing it down" in the course of a few days. The product is 100 galls. of cordial at 64 u. p.

Pimen'to. *Syn.* PIMENTO CORDIAL, PIMENTO DRAM. Rather strongly flavoured with allspice or pimento. It has obtained a great repute in the West Indies in diarrhœa, cholera, and bowel complaints generally.

Rasp'berry Cordial. *Prep.* From raspberry brandy, capillaire, and water, equal parts. A similar article is prepared by flavouring sweetened spirit with the new 'raspberry essence.'

Rat'ifia. The numerous liqueurs bearing this name are noticed in another part of this volume. See RATIFIA.

Shrub. See the article SHRUB in another part of this work.

Sighs of Love. *Prep.* 1. From proof spirit flavoured with otto of roses and capillaire, equal parts.

2. From sugar, 6 lbs.; pure soft water q. s. to produce a gallon of syrup, to which add, of eau de rose, 1 pint; proof spirit, 7 pints. It is stained of a pale pink by powdered cochineal. A very pleasant cordial. A drop or two (not more) of essence of ambergris or vanilla improves it.

Tears of the Widow of Malabar. *Prep.* As BALM OF MOLUCCA, but employing cloves (bruised), ½ oz., mace (shredded), 1 dr., and a teaspoonful of essence of vanilla for flavouring. Some add of orange-flower water, ¼ pint. It is slightly coloured with burnt sugar.

Tent. From plain spirit (22 u. p.) and port wine, of each, 1 quart; sherry and soft water, of each, 1 pint; orange-flower water and lemon juice, of each, ¼ pint; essence of ambergris, 2 drops (not more); sugar, 2 lbs. See WINE.

Us'quebaugh. See the article USQUEBAUGH in another part of this work.

LIQUEUR DE LA MOTTE. [Fr.] See DROPS (Golden) and TINCTURE.

LIQUEUR DORÉE. [Fr.] *Prep.* Take of cinnamon, bitter orange peel, and Peruvian bark, of each, ½ oz.; hay saffron, ¼ oz.; brandy and Malaga wine, of each 3 quarts; digest for a week, strain, and add of lump sugar, 2 lbs. Tonic, stomachic, and stimulant; chiefly used as an agreeable alcoholic dram.

LIQUEUR DE PRESSAVIN. [Fr.] *Prep.* From oxide of mercury (freshly precipitated) and cream of tartar, of each, 1 oz.; hot water, 1 quart; dissolve and filter. For *use*, 2 spoonfuls of this liquor are added to 1 quart of water.—*Dose.* A wine-glassful 3 or 4 times a day, avoiding the use of common salt. This is simply a solution of potassio-tartrate of mercury, and may be taken in the usual cases in which mercury is administered.

LIQUODIL'LA. See LIQUEUR.

LIQUID-AMBAR. *Syn.* COPALM BALSAM. A fluid balsamic juice obtained from the *Liquidambar styraciflua*, an American tree. It closely resembles LIQUID STORAX in its properties, and may be applied to the same purposes. See STYRAX.

LIQ'UOR. *Syn.* LIQUOR, L.; LIQUEUR, Fr. This term is given in the London Pharmacopœia to those aqueous solutions commonly, though improperly, called 'WATERS;' ammoniæ liquor potassæ, &c. It is now more correctly applied to the 'WATERS' of the British Pharmacopœia. See SOLUTION.

The term 'liquor' has also, of late years, been applied to certain concentrated preparations, most of which would be more correctly termed 'FLUID EXTRACTS,' as they merely differ from good extracts in their consistence, and from ordinary extracts in containing less starchy matter, albumen, and gum. There is also usually a little spirit added to them, to prevent decomposition. Liquors of this kind may be prepared of the finest quality, by the same processes that are required for the preparation of good soluble extracts; observing to stop the evaporation as soon as the consistence of treacle is acquired, and when cold, to add 1-4th or 1-5th part of their weight (after evaporation) in rectified spirit. The addition of 3 or 4 drops of the oils of cloves and mustard seed, dissolved in the spirit, will secure them from any risk of 'moulding' or fermenting; in fact, with this addition many of them will keep well without spirit, provided they are evaporated sufficiently, and kept in a cool place. The liquors, which are merely concentrated infusions or decoctions, and which, in their consistence, do not even approximate to extracts, may be made in the manner directed under those heads.

Much confusion would be prevented if the terms 'concentrated decoction' 'concentrated infusion,' &c., were adopted for those vegetable preparations possessing 8 times the usual strength; 'liquors' for those of a higher strength, but still sufficiently liquid to be treated as such in dispensing, &c.; and 'fluid extracts,' for those possessing considerable consistence, and approaching the common extracts in their degree of concentration and mode of preparation. See DECOCTION, INFUSION, ESSENCE, EXTRACT, SOLUTION, &c.

⁂ The following formulæ present some illustrations of the preparation of this class of medicines.

Liquor, Anodyne. See SPIRIT OF ETHER.

Liquor, Antinephritic. *Syn.* LIQUOR ANTINEPHRITICUS, L. *Prep.* (Adams.) Poppy heads, 6 oz.; water, 1½ pint; boil to one third, strain with pressure, and add of nitrate of potassa, 1 oz.—*Dose.* 1 to 2 teaspoonfuls night and morning; in gravel and painful affections of the kidneys and bladder.

Liquor, Antipodag′ric (Beguin's). *Syn.* HOFFMANN'S GOUT LIQUID; LIQUOR ANTIPODAGRICUS HOFFMANNII, L. *Prep.* From Boyle's fuming liquor, 1 part; spirit of wine, 3 parts. Sudorific.—*Dose.* 20 to 30 drops; or externally, in gout, and other painful affections, either alone or combined with camphor. See AMMONIA (Perhydrosulphate).

Liquor, Antipsor′ic. *Syn.* LIQUOR ANTIPSORICUS, LOTIO A., L. *Prep.* (Van Mons.) Sulphuret of sodium, 1½ dr.; hydrochlorate of ammonia, 75 grs.; dissolve each separately in water, ½ pint, mix the solutions, and filter. In itch, and other moist skin diseases.

Liquor, Bleaching. See SOLUTION OF CHLORIDE OF LIME.

Liquor, Boyle's Fu″ming. The perhydrosulphate of ammonia.

***Liquor* of Calum′ba.** *Syn.* LIQUOR CALUMBÆ, L. Same as CONCENTRATED INFUSION OF CALUMBA.

Liquor of Cam′phor. See ESSENCE.

Liquor of Chiret′ta. Same as CONCENTRATED INFUSION OF CHIRETTA.

Liquor of Cincho′na. *Syn.* LIQUOR OF BARK, CONCENTRATED INFUSION OF BARK, INSPISSATED I. OF B.; INFUSUM CINCHONÆ SPISSATUM (Ph. L.), L. *Prep.* 1. (Ph. L.) Yellow cinchona bark (bruised), 3 lbs., is macerated in distilled water, 6 pints, at two successive operations, as directed under EXTRACT OF CINCHONA—Ph. L.; the mixed infusions are evaporated by the heat of a water bath to one fourth, and placed aside to settle; the clear portion is decanted, the remainder strained, and the mixed liquid again evaporated until its sp. gr. reaches 1·200; to this, when cold, rectified spirit is dropped in, by degrees, "so that 3 fl. drs. may be added to each fl. oz. of the liquor;" lastly, allow it to repose for 20 days, that the dregs may subside.

Obs. It is not at all clear whether the College means 3 fl. drs. of spirit to be added to each fl. oz. of the liquid before its addition, or that it is to be added so that each fl. oz. of the product shall contain that quantity. We presume the former. 1 fl. dr. of this preparation is said to represent fully 4 fl. oz. of the INFUSION OF CINCHONA—Ph. L.; but it is obvious that it must be liable to great variations in strength. "In a general way, 1 fl. dr. may be considered equal to 3 fl. oz. of the infusion." (Pereira.) As commonly met with, this preparation is nearly destitute of the cinchona alkaloids.

2. Yellow cinchona bark, bruised, 56 lbs., and water holding in solution sulphuric acid, 1½ lb., are macerated together, with occasional agitation, in a covered earthen vessel, for 48 hours, after which the liquid is expressed, and the residuum or marc is treated with fresh water; the mixed strained liquid is then evaporated as rapidly as possible in earthenware, to exactly 6 lbs.; to this, rectified spirit, 1¼ lb., is added, and the whole is set aside for a week or 10 days; the clear portion is, lastly, decanted and preserved in well-closed bottles. The product is very rich in quinine. It is 96 times as strong as the DECOCTION OF CINCHONA—Ph. L., and 12 times as strong as the above preparation of the Ph. L. This preparation resembles the 'LIQUOR CINCHONÆ' sold by certain houses in the trade, at 24s. per lb., wholesale.

3. Exhaust the bark as above, by maceration in 3 successive waters without acid, filter, evaporate the mixed liquors to 7 lbs., and proceed as before. Inferior to the last, and less rich in the cinchona alkaloids. Very thick; scarcely liquid.

4. From PALE BARK:—(LIQUOR CINCHONÆ PALLIDÆ; INFUSUM CINCHONÆ SPISSATUM—Ph. L.) From pale bark, as the last. See INFUSION OF CINCHONA.

Disinfect′ing Liquor. See SOLUTION (Chlorides of Lime, Soda, and Zinc), and DISINFECTING COMPOUNDS.

Liquor of Er'got. *Syn.* ESSENCE OF ERGOT OF RYE, CONCENTRATED INFUSION OF E.; ESSENTIA SECALIS CORNUTI, LIQUOR ERGOTÆ, INFUSUM ERGOTÆ CONCENTRATUM, L. *Prep.* Recent ergot of rye (reduced to coarse powder by pounding, or preferably by grinding it in a pepper-mill), 1½ lb., and boiling distilled water, 4 lbs., are digested together in a closed vessel, with frequent agitation, until cold, and then put into a wide-mouthed bottle, along with rectified spirit, 2 lbs.; the whole is then allowed to macerate for a week, after which the liquor is expressed and filtered. *Obs.* 4 fl. drs. of this essence are equal to 1 dr. of ergot in substance. It is 8 times the strength of the INFUSION (as usually prepared according to the formula of Pereira and others), and 2½ times the strength of the TINCTURE OF ERGOT of the London Apothecaries' Hall. This is the only ESSENCE or LIQUOR OF ERGOT known in the wholesale trade.

Liquor of Flints. See SOLUTION.

Libavius's Liquor. Bichloride of tin.

Liquor of Mat'ico. *Syn.* CONCENTRATED INFUSION OF MATICO; LIQUOR MATICONIS, INFUSUM MATICONIS CONCENTRATUM, L. *Prep.* From matico leaves, 1 lb.; rectified spirit, ½ pint; distilled water, 32 fl. oz.; digest 10 days, express, and filter. 1 fl. dr. added to 7 fl. drs. of water is equal to 1 fl. oz. of the common INFUSION.

Liquor of Myrrh. *Syn.* SOLUTION OF MYRRH; LIQUOR MYRRHÆ, LOCO LIQUAMINIS MYRRHÆ, L. *Prep.* (Ph. Bor.) Extract of myrrh (Ph. Bor.), 1 oz.; distilled water, 5 fl. oz.; mix thoroughly, decant, and strain. It should be of a brownish-yellow colour, and turbid.—*Dose.* ½ to 1 fl. dr.

Liquor of O'pium. *Syn.* LIQUOR OPII, L. O. CONCENTRATUS, L. OPIATUS, L. See BLACK DROP.[1]

1. (Messrs. Smith.) Opjum, 4 oz., is made into an extract, and 'denarcotized' by ether; it is then dissolved in alcohol, filtered, evaporated nearly to dryness, and redissolved in water, q. s. to furnish 12 oz. of solution; to this is added, of rectified spirit, 2¾ oz., with water, q. s. to make the whole up to 16 oz.—*Dose.* 3 to 12 drops.

2. (Acetic; LIQUOR OPII ACETICUS, L.) See LAUDANUM (Houlton's).

3. (Citric; LIQUOR OPII CITRICUS, L.)—*a.* Powdered opium, 1½ oz.; lemon juice, 1½ pint; evaporate to one half, cool, add of rectified spirit, 5 fl. oz., and the next day decant or filter; same strength as 'LAUDANUM.'

b. (LIQUOR MORPHIÆ CITRATIS—Dr. Porter.) Opium, 4 oz.; citric acid, 2 oz.; triturate, and add of boiling water, 15 fl. oz.; digest with agitation for 24 hours, and filter. This last has above three times the strength of 'LAUDANUM.' It is sadly misnamed.

4. (Hydrochloric; SOLUTION OF MURIATE OF OPIUM; LIQUOR OPII HYDROCHLORICUS, L.—Dr. Nichol.) Powdered opitum, 1½ oz.; distilled water, 1 pint; hydrochloric acid, 1½ fl. oz.; digest a fortnight, and strain with expression. Same strength as 'LAUDANUM.' According to Dr. Nichol, this is preferable to every other preparation of opium.

5. (Sedative; BATTLEY'S SEDATIVE SOLUTION OF OPIUM; LIQUOR OPII SEDATIVUS, L.)—*a.* Hard aqueous extract of opium (bruised), 3 oz., is boiled in water, 1½ pint, until dissolved; to the solution, when cold, rectified spirit, 6 oz., is added, together with water, q. s. to make the whole measure exactly 1 quart; the liquor is, lastly, filtered.

b. From hard extract of opium, 22 oz.; boiling water, 13 pints; rectified spirit, 3 pints; as the last.

c. From extract of opium—Ph. L., 4¼ oz.; water, 1 quart; boil till reduced to 34 fl. oz.; cool, filter, and add of rectified spirit, 5 fl. oz., and water, q. s. to make up exactly 1 quart.

Obs. The first two formulæ, which vary only in their quantities, are identical with that employed by Mr. Battley. As hard extract of opium is not always at hand, we have introduced a formula in which the ordinary extract is ordered. It gives a precisely similar product to the others, provided the cold aqueous decoction is filtered before adding the spirit. Battley's LIQUOR OPII SEDATIVUS is an excellent preparation, less exciting than opium or laudanum.—*Dose.* 10 to 30 drops. Dr. Christison states that 20 drops of Battley's solution are equal to 30 drops of the common tincture.

Liquor of Rhu'barb. *Syn.* LIQUOR RHEI, INFUSUM RHEI CONCENTRATUM, L. *Prep.* 1. Rhubarb (well bruised), 6¾ oz.; water, q. s.; rectified spirit, ½ pint; proceed as for INFUSION OF CALUMBA (conc.); to produce a quart. 8 times the usual strength.

2. See INFUSION OF RHUBARB (Concentrated).

3. See EXTRACT OF RHUBARB (Fluid).

Liquor of Sarsaparil'la. *Syn.* FLUID EXTRACT OF SARSAPARILLA; LIQUOR SARZÆ, ESSENTIA SARSAPARILLÆ, L. *Prep.* Either the simple of the compound liquor or sarsaparilla may be made from the corresponding decoction, or, preferably, the infusion prepared with water at 125° Fahr., by carefully evaporating it until sufficiently concentrated, and then straining it through flannel, and adding a little spirit. Jamaica sarsaparilla should be alone employed, as the other varieties, especially the Honduras, not only possess less medicinal virtue, and yield less extract, but are very liable to ferment and get mouldy, unless an undue proportion of spirit is added to them. See EXTRACT OF SARSAPARILLA (Fluid).

Liquor of Sen'na. *Syn.* LIQUOR SENNÆ, L. Both the FLUID EXTRACT and the CONCENTRATED INFUSION OF SENNA are called by this name, but more generally the former. The following are additional formulæ:—

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[1] Under DROPS, page 415.

1. (Duncan.) Senna, 15 lbs.; boiling water, 5 galls.; proceed by the method of displacement, evaporate the product to 10 lbs., add of molasses, 6 lbs. (previously concentrated over a water bath until it begins to congeal on cooling), dissolve, and further add of rectified spirit, 1¼ pint, together with water, q. s. to make the whole measure exactly 12 pints. Every fl. oz. represents 1 oz. of senna.

2. (Dr. Tweedy.) As the last, but using tincture of ginger (prepared with rectified spirit), 1½ pint, instead of the spirit there ordered.

Liquor of Soap. *Syn.* LIQUOR SAPONIS, L. See TINCTURE.

Styp'tic Liquor. *Syn.* LIQUOR STYPTICUS, L. *Prep.* (Ph. Slevico-Holsat. 1831.) Alum and sulphate of copper, of each, 1½ oz.; sulphuric acid, 1 oz.; water, 1 lb.; dissolve, and filter.

Liquor of Tarax'acum. *Syn.* FLUID EXTRACT OF DANDELION; EXTRACTUM TARAXACI FLUIDUM, LIQUOR TARAXACI, L. *Prep.* 1. Dandelion roots, (dried), 28 lbs., are rinsed in clean cold water, to remove dirt, and then sliced small, and macerated in enough cold water, to cover them, for 24 hours; the liquid is next pressed out, and after the fecula has subsided, the clear portion is decanted, and heated to 180° or 190° Fahr., to coagulate the albumen; the liquid is then filtered while hot, and evaporated by steam, or preferably by a current of warm air, until it is reduced to 22½ lbs.; to this, rectified spirit, 6 lbs., is added, and after thorough agitation, the vessel is set aside for a week or a fortnight, after which the clear portion is gently poured from the sediment and preserved in well-closed bottles in a cool place. A very fine article. It represents an equal weight of the root.

2. The expressed juice of dandelion is heated to near the boiling-point, strained, and evaporated, as the last, to a proper consistence; ¼th or ⅕th of rectified spirit is then added, and the liquid is otherwise treated as before. Very odorous and pale coloured.

3. Dried root (coarsely powdered), 1 lb.; water, 1¼ pint; rectified spirit, ½ pint; digest a week, express the liquor, pass it through a hair sieve into a bottle, and in 10 days decant the clear portion.

4. (Ph. Bor.) Extract of dandelion, 3 parts; water, 1 part (or q. s.); triturated together.

5. (W. Procter.) Fresh root, 2 lbs., is sliced and reduced to a pulp, and macerated with ⅛th of its bulk of rectified spirit for 24 hours; it is then subjected to strong pressure, the marc is treated with water containing a little spirit, 1 pint, and the liquid is again expressed; the mixed product is evaporated to 12 fl. oz., and when cold, rectified spirit, 4 fl. oz., is added, and the whole filtered.

Obs. Liquor of taraxacum has a very large sale. The *dose* is 1 to 2 fl. drs. See EXTRACT.

. **Liquor of Valer'ian.** See EXTRACT OF VALERIAN (Fluid).

Liquor of Vanil'la. *Syn.* FLUID EXTRACT OF VANILLA; LIQUOR VANILLÆ, EXTRACTUM V. FLUIDUM, L. *Prep.* 1. Vanilla (sliced), 1 lb.; rectified spirit, 3 pints; prepare a tincture either by displacement or maceration, and reduce it, by distillation at the lowest possible temperature, to 1½ lb.; put this into a strong bottle whilst hot, add of white sugar candy (in powder), ½ lb., cork down, and agitate the whole until it is nearly cold. Very fine. *Used* chiefly for its odour and flavour. It represents half its weight of vanilla.

2. (W. Procter.) Vanilla (cut into thin transverse slices), 1 oz.; sugar, 3 oz.; triturate, until reduced to fine powder, put it into a strong pint bottle, along with syrup, ½ pint; water, 2 oz.; tie down the cork, and set the bottle for half an hour in boiling water; cool, strain, and treat the residue in a like manner with a mixture of water, 6 fl. oz., and rectified spirit, 1 fl. oz.; lastiy, mix the two products. Greatly inferior to the last.

LIQ'UORICE. *Syn.* STICK LIQUORICE; LIQUORITIA, GLYCYRRHIZÆ RADIX (B. P.), GLYCYRRHIZÆ RADIX, GLYCYRRHIZA (Ph. L. & D.), G. GLABRA (Ph. E.), L. "The root or underground stem of the *Glycyrrhiza glabra*, fresh and dried, cultivated in Britain." "The recent and the dried root of *Glycyrrhiza glabra*," or common liquorice. "The fresh root is to be kept buried in dried sand for use." (Ph. L.) It has a sweetish taste, and is slightly aperient, expectorant, and diuretic. It is a popular demulcent and pectoral. Its extract and solution are much used as a domestic remedy for cough. As a masticatory, it allays thirst and irritation. Its extract is the common LIQUORICE, SPANISH LIQUORICE, or SPANISH JUICE, of the shops. See EXTRACT, &c.

LIST. The border or selvage torn off a piece of cloth. It is used by the French polishers and law stationers to form their rubbers, and for numerous other purposes.

LITH'ARGE. *Syn.* SEMI-VITRIFIED OXIDE OF LEAD; PLUMBI OXYDUM (Ph. L.), PLUMBI OXYDUM SEMI-VITREUM (Ph. D.), LITHARGYRUM (Ph. E.), L. The litharge of commerce is semi-vitrified protoxide of lead, obtained chiefly by scraping off the drops that form on the surface of melted lead exposed to a current of air (dross of lead; plumbum ustum), and heating it to a full red, to melt out any undecomposed metal. The fused oxide, in cooling, forms a yellow or reddish semi-crystalline mass, which readily separates into scales; these, when ground, constitute the 'powdered litharge' of the shops. Litharge is also prepared by exposing red lead to a heat sufficiently high to fuse it, and 'English litharge' is obtained as a secondary product by liquefaction, from argentiferous lead ore, when it is often called 'silver stone.'

Pur. "Entirely, or almost entirely, soluble in dilute nitric acid. This solution is blackened by sulphuretted hydrogen. Potassa throws down a white precipitate, which is redissolved by adding the same in excess. If sulphate of soda be added to 100 grs. of this oxide dissolved in nitric acid, 135 grs. of sulphate of lead is precipitated." (Ph. L.) "50 grs. dissolve entirely, and without effervescence, in 1½ fl. oz. of pyroligneous acid, and the solution precipitated by 53 grs. of phosphate of soda remains precipitable by more of the test." (Ph. E.) The solution in both acetic and nitric acid should be colourless. It is of great importance to the pharmaceutist to obtain pure litharge, as the slightest impurity will often colour and spoil his lead plaster (EMP. PLUMBI), and solution of diacetate of lead (LIQ. PLUMBI DIACETATIS).

Uses. Litharge is employed in pharmacy, to make plasters and several other preparations of lead; by painters as a 'drier' for oils; and for various other purposes in the arts.

Obs. The litharge of commerce is distinguished by its colour as LITHARGE OF GOLD (LITHARGYRUM AURI, L. AURIUM, L. CHRYSITIS), which is dark coloured and impure, and LITHARGE OF SILVER (SILVER STONE; LITHARGYRUM ARGENTI, L. ARGENTEUM, L. ARGYRITIS), which is purer, and paler coloured. The dark colour of the former is generally said to be owing to the presence of red lead. Foreign litharge generally contains copper and iron; and, not unfrequently, a little silver and silica. These are readily detected by the usual tests. In grinding litharge, about 1 lb. of olive oil is usually added to each 1 cwt., to prevent dust. The best solvents of litharge are nitric acid and acetic acid. As it slowly absorbs the carbonic acid of the air, it generally effervesces slightly when treated with acids, and this effervescence is stronger in proportion to its age. See LEAD.

LITH'IUM. Li. The metallic base of LITHIA, first obtained by Sir H. Davy by exposing hydrate of lithium in contact with mercury to galvanic action, and decomposing the resulting amalgam by distillation. It is now obtained by fusing pure chloride of lithium in a small, thick, porcelain crucible, and decomposing it while in a fused state by a current of electricity. It is a white metal, like sodium, very oxidizable, fusing at 356°, and having a sp. gr. of ·59. It is the lightest metal known. It belongs to the 'alkaline group,' of which potassium, sodium, cæsium, and rubidium, are the other members.

Lithium forms salts analogous to those of sodium, but usually somewhat less soluble. They can be distinguished from those of potassium and sodium by the phosphate and carbonate being only sparingly soluble in water, —from those of barium, strontium, and calcium, by forming crystallisable and soluble salts with sulphuric acid and oxalic acid,—and from those of magnesium, by the solution of its carbonate exhibiting an alkaline reaction. Heated on platinum, they tinge the flame of the blowpipe carmine red. The salts of lithium may generally be formed by dissolving the hydrate or carbonate in dilute acids.

Lithium, Car'bonate of. Li_2CO_3. *Syn.* CARBONATE OF LITHIA; LITHIÆ CARBONAS (B. P.). *Prep.* To an aqueous solution of sulphate of lithium, add a strong solution of carbonate of ammonium, collect the precipitate, drain, and press, wash with a little rectified spirit, and dry. By dissolving it in boiling water, and slowly evaporating the solution, crystals may be obtained.

Prop., &c. It resembles carbonate of magnesium in appearance; is soluble in about 100 parts of cold water, and in considerably less of boiling water, and is insoluble in alcohol. The tests for its purity given in the B. P. are—in giving no precipitate with oxalate of calcium or lime water, and leaving, when 10 grains are neutralised with sulphuric acid and ignited, 14·86 grains of dry sulphate. It has been proposed by M. Lipowitz, Dr. Garrod, and others, as a solvent for uric acid calculi. According to Biswanger, 1 part of carbonate of lithia in 120 parts of water takes up, at blood-heat, nearly 4 parts of uric acid. Mr. Alexander Ure recommends a dilute solution of this substance as an injection in lithic calculus, as it is a better solvent of uric acid than either borax or the alkaline carbonates. "Of all the various menstrua hitherto recommended, none appear to promise more favourably than the carbonate of lithia." "If by means of injections" (of this solution) "we can reduce a stone at the rate of a grain or more an hour, we shall not merely diminish the bulk of the calculus, but further loosen its cohesion, disintegrate it, so to speak, causing it to crumble down, and be washed away in the stream of urine." (Mr. A. Ure.)—*Dose.* 2 to 5 grs., twice or thrice a day; as an injection, 1 gr. to water, 1 fl. oz.

Lithium, Citrate of, $Li_3C_6H_5O_7$. *Syn.* LITHIÆ CITRAS (B. P.). A white deliquescent amorphous powder, made by acting on 50 grains of lithium carbonate with 100 of citric acid, and is readily soluble in 2½ parts of water.

Test., &c. 20 grains burnt at a low red heat until white leave 10·6 grains of carbonate of lithium. Its medical properties are similar to those of the carbonate.—*Dose.* 5 to 16 grains, largely diluted.

Lithium, Oxide of. Li_2O. *Syn.* LITHIA. An alkaline earth found in petalite, &c., and in small quantities in most mineral waters.

Prep. Petalite (a silicate of aluminum and lithium) in powder mixed with twice its weight of fluor spar is heated with strong sulphuric acid as long as acid vapours are given off. The residue is treated with ammonia, boiled, and filtered, evaporated to dryness, and heated to redness. The residue consists of sulphate of lithium, from which the oxide is obtained by decomposing it with acetate of barium, filtering and heating after having evaporated the solution to dryness.

This yields the so-called oxide, which is in reality the hydrate, $LiHO$, and is a white, non-volatile. soluble, caustic solid. The true oxide is a white powder decomposed by water forming the hydrate, and obtainable by igniting the metal in oxygen.

Lithia, Effervescing Solution of. *Syn.* LIQUOR LITHIÆ EFFERVESCENS. *Comp.* Water charged with carbonic acid and holding in solution carbonate of lithium.—10 fl. oz. contain 5 grains of the carbonate.—*Props.* Colourless liquid, possessing powerful diuretic properties. —*Use.* Antilithic, for dissolving calculi of uric acid.—*Dose.* 5 to 10 fl. oz.

LITHOG'RAPHY. The art of tracing letters, figures, and other designs, on stone, and transferring them to paper by impression. Our notice of this beautiful and useful art must necessarily be brief.

There are two methods of lithography in general use. In the one, a drawing is made on the stone with a lithographic crayon, or with lithographic ink; in the other method, the design is made on lithographic paper, which, on being moistened and passed through the press, leaves its design on the surface of the stone, reversed. In either method, water acidulated with nitrous acid, oil of vitriol, or hydrochloric acid, is poured over the stone, and this, by removing the alkali from the chalk or ink, leaves the design on it in a permanent form, at the same time that it 'etches' away a portion of the lights, and renders the surface more absorbent of water.

The process of lithographic printing is as follows:—Water is thrown over the stone, the roller charged with printing ink is passed over the surface, the paper is applied, and a copy is obtained by the action of the lithographic press. The same process must be had recourse to for each copy. The nature of the stone is such that it retains with great tenacity the resinous and oily substances contained in the ink or crayon employed to form the design, and also absorbs water freely; this, combined with the peculiar affinity between resinous and oily substances, and their mutual power of repelling water, occasions the ink on the printing roller to adhere to the design, and to leave untouched the lights.

The stones are prepared for lithography by polishing in the ordinary way; the style of work for which they are intended determining the degree of labour bestowed upon them. For crayon drawings, the surface should have a fine grain, but the finish of the stone must depend upon the desired softness of the intended drawing; for writing or drawing on in ink, the surface must receive a higher polish, and must be finished off with pumice-stone and water

The best lithographic stones are obtained from Solenhofen, near Munich, and from Pappenheim, on the banks of the Danube. The white lias which lies immediately under the blue, near Bath, also yields good lithographic stones, and furnishes the principal portion of those employed in this country. See CRAYONS, INK, and PAPER.

LITHONTRYP'TICS. *Syn.* LITHOTRYPTICS; LITHONTRYPTICA, L. Under this head are intended numerous substances (LITHICS; LITHICA, L.) used to prevent the formation of urinary calculi, or to dissolve them when already formed. Those employed with the former intention are more correctly termed ANTILITHICS (ANTILITHICA, L.), and those with the latter, LITHONTRYPTICS, or LYTHONLYTICS (LITHONTRYPTICA, LITHONLYTICA, L.).

The following are the principal substances included under this head by pharmacological writers:—Alkalies and their carbonates, benzoic acid, borax, carbonate of lithia, effervescing solution of lithia, carbonic acid, cinnamic acid, diluents (generally), diuretics (generally), juniper, malic acid, Malvern waters, mineral acids, nitrosaccharate of lead, opium, phosphate of soda, phosphoric acid, poppies, turpentines, uva ursi, vegetable acids, vegetable astringents, vegetable bitters, Vichy waters, wall pellitory, water (pure).

LIT'MUS. *Syn.* TURNSOLE; LACMUS, LACCA CÆRULEA, L. MUSIVA, L. MUSCI, L. A blue substance prepared by the united influence of water, air, ammonia, and either potassa or soda, from *Rocella tinctoria*, *Lecanora tartarea*, or any of the other tinctorial lichens capable of yielding archil, by a process essentially similar to that adopted for the latter substance, except that chalk is generally used to form the paste, which is moulded into cakes and dried.

Pur., &c. "Soluble in both water and alcohol. Its blue colour is reddened by acids, and is restored by the addition of alkalies." (Ph. L. 1836.) It is extensively used by the dyer as a red and crimson colouring matter, and by the chemist as a test for acids. See ARCHIL, CUDBEAR, &c.

LIVE-LONG. Digestive candy. See CANDYING.

LIV'ER. *Syn.* HEPAR, L. A large abdominal viscus, the exclusive duty of which, until recently, was stated by physiologists to be to secrete bile; but the secretion of sugar for combustion in the lungs or capillaries is now said to be one of its chief duties. The liver is subject to several diseases, both functional and organic, among which inflammation (hepatitis) holds the most prominent place. The acute form of this disease is ushered in with pain in the region of the liver, with sickness, costiveness, and a strong, hard, and frequent pulse, with great pain about the clavicle and shoulders. There is cough, oppressed breathing, and often vomiting of bilious matter. The urine is scanty, and of a saffron-yellow colour, and the skin and eyes are also tinged yellow. The treatment consists chiefly in purging with salines accompanied with mercurials, the use of antimonials, and a blister applied over the region of the liver. Bitter tonics, as calumba, cascarilla, and gentian, may afterwards be had recourse to; and if the patient resides in a hot climate a change to a temperate one should be made, if possible. Chronic hepatitis requires similar treatment, but of a less active character. The more usual causes of diseases of the liver, besides those common to the other viscera, are residence in a hot climate, and the excessive use of highly seasoned food and alcoholic liquors.

Liv'er. *Syn.* HEPAR, L. In *chemistry* and *pharmacy*, a term formerly applied to numerous substances, on account of their colour; as liver of antimony (HEPAR ANTIMONII), liver of sulphur (HEPAR SULPHURIS), &c.

LIXIVIA'TION. The process of dissolving out or extracting the saline matter of bodies, more especially of ashes, the residua of distillations, &c., by means of ablution or digestion in water. The solution so obtained is called a 'LYE,' 'LEY,' or 'LIXIVIUM,' and the salts resulting from the evaporation of such solutions 'LIXIVIAL SALTS.'

LLA'MA. *Syn.* GUANACO; LAMA, L. A genus of animals of the family *Bovidæ* and tribe *Camelina*. The llama is confined to South America, and may be regarded as the representative of the camel in the New World. The most important species are *Lama vicugna* (the VICUNA) and *L. Guanacus* (the GUANACO). The wool of llamas is woven into stuffs for *ponchos*, and made into cords, sacks, &c. See ALPACA.

LOAD'STONE. *Syn.* LODESTONE, MAGNESIAN STONE, MAGNETIC IRONSTONE. Native magnetic oxide of iron (Fe_3O_4). It is often found massive, frequently crystallised, and occasionally in beds of considerable thickness. Its colour varies from reddish-black to deep gray. Native magnets from Arabia, China, and Bengal, are commonly of a reddish colour, and are powerfully attractive. Those found in Germany and England have the colour of unwrought iron; those from Macedonia are more black and dull.

LOAM. A native mixture of clay, sand, and oxide of iron, with more or less chalk. Loamy soils are of this description. They are called heavy or light, according to the proportion of clay; and sandy, calcareous, or gravelly, just as sand, gravel, or chalk, form a characteristic portion of them.

LOBEL'IA. *Syn.* INDIAN TOBACCO; LOBELIA (B. P., Ph. L. E. & D.), L. "The flowering herb of *Lobelia inflata*" (B. P., Ph. L.), or bladder-podded lobelia. The herb has an unpleasant odour, and an acrid, burning, nauseous taste, somewhat resembling that of tobacco. In small doses (1 to 3 grs.), it is expectorant and diaphoretic; in larger doses (5 to 15 grs.), nauseant and emetic; and in excessive doses, poisonous. According to Dr. Pereira, its principal value is that of an anti-spasmodic. It has been highly recommended by Dr. Elliotson in spasmodic asthma. He commences with small doses, and gradually increases them, unless headache or nausea occurs. Others give a full dose at or before the commencement of the fit. It has been also tried in croup, hooping-cough, and other diseases of the respiratory organs, with variable effect.

Lobelia is the panacea of Dr. Coffin, the author of the pretended system of medicine irreverently called 'Coffinism.'

LOBEL'IC ACID. The acid existing in decoction of lobelia. It closely resembles gallic acid. It reddens litmus, and is precipitated by several metallic salts.

LOBEL'INE. *Syn.* LOBELINA, L. A light yellowish-brown oily substance, found by Calhoun of Philadelphia in *Lobelia inflata*. It is volatile, soluble in alcohol, ether, and water; and in oil of turpentine, oil of almonds, and some other fixed oils; with the acids it forms crystallisable salts, which are soluble. It may be obtained from the seeds by the action of alcohol acidulated with acetic acid, evaporating, treating with magnesia and then with ether, and again evaporating. 1 oz. of the seeds furnishes 2 grs. When perfectly pure, 1 gr. will kill a large dog.

LOB'STERS. See SHELL FISH.

LOCK'SOY. Rice boiled to a paste and drawn into threads. *Used* to thicken soups. It is imported from China.

LOG'WOOD. *Syn.* CAMPEACHY WOOD; HÆMATOXYLUM (Ph. L. E. & D.), HÆMATOXYLI LIGNUM (B. P.), LIGNUM CAMPECHENSE, L. CAMPECHIANUM, L. The heart-wood of *Hæmatoxylon Campechianum*, a native of the coast of Campeachy, but now common in the West Indies and India. It is a valuable astringent, and its decoction, extract, and infusion, are useful remedies in chronic diarrhœa and dysentery, and in hæmorrhages, &c. The extract is an efficient substitute for catechu and kino.

Logwood is extensively employed in dyeing and calico printing, for the production of reds, violets, purples, blacks, drabs, &c. It readily yields its colour both to spirit and boiling water. The colouring matter requires a large quantity of water to dissolve it, but when dissolved can be concentrated to any degree by boiling down. The infusion is of a fine red, turning on the purple or violet; acids turn it on the yellow, and alkalies deepen it. To stuffs mordanted with alum, it gives various shades of violet and purple, according to the proportions of the materials. By using solution of tin as the mordant, various shades of red, lilac, and violet, may be obtained. The addition of a little Brazil wood is commonly made to brighten the red. With a mordant of sulphate or acetate of iron, it dyes black; and with the addition of a little sulphate of copper, grays of various shades. It is, however, chiefly employed, in conjunction with gall-nuts, for blacks, to which it imparts a lustre and velvety appearance. Silk is usually turned through the cold decoction, but for wool the decoction is used either hot or boiling. Logwood is one of the cheapest and most easily managed of the dye stuffs. It is also used to make ink. See HÆMATOXYLIN, INK, &c.

LO'HOCH. See LINCTUS.

LOR'ICA. A species of lute applied as a coating to chemical vessels before exposing them to the fire. Its application is called LORICATION. See LUTE.

LO'TION. *Syn.* LOTIO, L. An external application, or wash, consisting of water holding in solution medicinal substances. Lotions may be prepared of any soluble medicaments that are capable of exerting their action by contact with the skin. Writers on pharmacology have arranged them in classes, as sedative, anodyne, stimulant, &c., according to their effects. Sedative and refrigerant lotions are commonly employed to allay inflammation;—anodyne and narcotic lotions, to relieve pain;—stimulant lotions, to induce the maturation of tumours, &c.;—detergent lotions, to clean foul ulcers;—repellent and resolvent lotions, to discuss tumours, remove eruptions, &c.;—counter-irritant lotions, to excite a secondary morbid action, with the intention of relieving one already existing. Lotions are usually applied by wetting a piece of linen with them and keeping it on the part affected; or, in slight cases, by moistening the part with the fingers previously dipped into them. Lotions are more agreeable if made with rose water, but are not thereby rendered more efficacious. In all cases, distilled water, or filtered soft water, is alone admissible as the solvent.

As lotions are, in general, mere extemporaneous or magistral preparations, it will, of course, be only necessary here to give the formulæ for a few of those which are the most useful or the most frequently employed. These will serve as examples from which others may be prepared. As a general rule, the medium dose of any substance dissolved in a fluid ounce of distilled water, forms a lotion of the proper strength, under all ordinary circumstances; or, what is the same thing, the medium dose in grains, taken in scruples, is sufficient for a pint of such a lotion. Thus, the dose of sulphate of zinc is 1 to 3 grs., therefore—$\frac{1+3}{2} = 2$ grs., which is the proportion of sulphate of zinc, to be taken for 1 fl. oz. of water, or 40 grs. for 1 pint. Again, the dose of bichloride of mercury is $\frac{1}{8}$ to $\frac{3}{4}$ gr.; therefore—$\frac{\frac{1}{8}+\frac{3}{4}}{2} = \frac{7}{16}$ gr.; or nearly ½ gr. per fl. oz., and 8½ grs. per pint. In this method extreme or unusual doses, as, for instance, those of sulphate of zinc, as an emetic, in poisoning, &c., are not taken into the calculation. In all cases in which lotions are intended for extremely susceptible parts, it is proper to dilute them with an equal bulk of water. When intended for eye-waters (COLLYRIA), they should be diluted with at least 3 to 4 times their bulk of water. See EMBROCATION, LINIMENT, &c.

Lotion of Ac'etate of Ammo''nia. *Syn.* LOTIO AMMONIÆ ACETATIS, L. *Prep.* 1. Solution of acetate of ammonia, 1 part; water, 2 parts.

2. (Hosp. F.) Solution of acetate of ammonia, rectified spirit, and water, equal parts. Discutient and refrigerant. In ordinary inflammations.

Lotion of Ac'etate of Lead. *Syn.* LOTIO PLUMBI ACETATIS, L. *Prep.* 1. (Collier) Acetate of lead, 1 dr.; distilled water, 8 fl. oz. Sometimes a little vinegar is added. In excoriations, burns, sprains, contusions, &c. See SOLUTION OF DIACETATE OF LEAD.

2. Acetate of lead, 2 grs.; distilled water, 1 oz. (Ophthalmic Hospital.)

Lotion of Ac'etate of Zinc. *Syn.* LOTIO ZINCI ACETATIS, L. *Prep.* 1. (Béral.) Acetate of zinc, 1½ dr.; water, 1 pint. Astringent; similar to lotion of sulphate of zinc.

2. Acetate of zinc, 1 to 2 grs.; water, 1 oz. An astringent collyrium in ophthalmia, and as injection in gonorrhœa after the acute stage has passed. Neither tincture nor wine of opium gives a precipitate with this lotion.

Lotion, Acetic. *Syn.* LOTIO ACETI, L. *Prep.* 1. Vinegar, 1 part; water, 2 or 3 parts. For bruises, contusions, &c., and as a general refrigerant application to sound parts.

2. Vinegar, 1 fl. oz.; cold water, ½ pint; as a wash in chronic ophthalmia, &c.

Lotion, Acid. See LOTIONS OF ACETIC, NITRIC, and PHOSPHORIC ACID, &c.

Lotion of Acon'itine. *Syn.* LOTIO ACONITINÆ, L. *Prep.* (Turnbull.) Aconitine, 8 grs.; rectified spirit, 2 fl. oz. In neuralgia; applied by means of a small piece of sponge mounted at the end of a stick. It must never be employed when the skin is broken or abraded; and it would be wise, in most cases, to dilute it with double its volume of proof spirit.

Lotion, Al'kaline. *Syn.* LOTIO ALKALINA, L. POTASSÆ CARBONATIS, L. *Prep.* (P. Cod.) From salt of tartar, 1 oz.; water, 1 pint. Stimulant and detergent. Diluted with an equal bulk of water, it forms an excellent cosmetic wash to remove scurf from the hair. Sometimes it is made with almond milk instead of water.

Lotion of Al'um. *Syn.* LOTIO ALUMINIS, L. *Prep.* From alum, 1½ dr.; distilled or rose water, 1 pint. Astringent. For sore gums, nipples, excoriations, &c.

Lotion, Ammoni'acal. *Syn.* LOTIO AMMONIÆ, L. AMMONIACALIS, L. *Prep.* 1. Liquor of ammonia, 3 fl. drs.; cold water, 5 fl. oz. As a stimulant to indolent ulcers, and in certain skin diseases.

2. (Swediaur.) Liquor of ammonia, spirit of thyme, and spirit of camphor, equal parts. In headaches; applied to the forehead and temples, and in other cases, as a counter-irritant. In most cases it should be used diluted.

3. (Opiated—Dr. Kirkland.) Sal volatile, 3½ fl. oz.; tincture of opium, ½ fl. oz.; water,

4 fl. oz. Anodyne, stimulant, and resolvent.

Lotion, Antiphlogis'tic. *Syn.* LOTIO ANTIPHLOGISTICA, L. *Prep.* 1. (Copland.) Solution of diacetate of lead, 3 fl. drs.; solution of acetate of ammonia, 2 fl. oz.; distilled water, 1 pint. Refrigerant, sedative, and repellent. *Used* to allay inflammation, &c.

2. (A. T. Thomson.) Opium, 2 drs., distilled vinegar, ½ pint. Anodyne and refrigerant; in swelled joints, &c.

Lotion of Ar'nica. *Syn.* LOTIO ARNICÆ, L. *Prep.* 1. Tincture of arnica, 1 fl. dr.; rose water, 2½ fl. oz. In contusions, bruises, extravasations, &c.

2. (Niemann.) Arnica flowers, ½ oz.; hot vinegar, 3 fl. oz.; boiling water, 5 fl. oz.; infuse until cold, and strain. In acute hydrocephalus; or with water, q. s. to measure a pint, as a common lotion.

Lotion, Arsen'ical. *Syn.* LOTIO ARSENICALIS, L. ACIDI ARSENIOSI, L. *Prep.* 1. Arsenious acid, 5 grs.; water, 1 pint. In psoriasis, &c.

2. (Compound—M. le Febre.) Arsenious acid, 8 grs.; boiling water, 16 fl. oz.; dissolve, and add, of extract of hemlock, 1 oz.; solution of diacetate of lead, 3 fl. oz.; tincture of opium, 1 fl. dr. Every morning, in cancer.

Astrin'gent Lotion. *Syn.* LOTIO ASTRINGENS, L. See LOTIONS OF ALUM, SULPHATE OF ZINC, &c.

Lotion, Barlow's. *Prep.* From sulphuret of potassium (in powder), 3 drs.; soap (sliced), 1½ dr.; lime water, 7½ fl. oz.; proof spirit, 2 fl. oz.; dissolve. In itch, ringworm, &c.

Lotion, Bateman's. *Prep.* From bichloride of mercury, 2 grs.; compound spirit of lavender, 1 fl. oz.; dissolve, and add of distilled water, 4 fl. oz. In obstinate cutaneous eruptions, more especially those of a papular character.

Lotion of Belladon'na. *Syn.* LOTIO BELLADONNÆ, L. *Prep.* (Graefe.) Extract of belladonna, ½ dr.; dilute solution of diacetate of lead, ½ pint. Applied to tumours and glandular enlargements.

Lotion of Benzoin. LOTIO BENZOINI. Tincture of benzoin, 1; rose water, 40. A nice lotion to protect the face from the heat of the sun.

Lotion of Bichlo''ride of Mercury. *Syn.* LOTIO HYDRARGYRI BICHLORIDI, L. H. CHLORIDI CORROSIVI, L. *Prep.* 1. Corrosive sublimate, 5 to 10 grs.; distilled water, 1 pint. The addition of 5 or 6 grs. of hydrochlorate of ammonia, or as many drops of hydrochloric acid, increases the solvent action of the water, and renders the preparation less liable to change. Some persons dissolve the sublimate in 1 or 2 fl. drs. of rectified spirit before adding it to the water; but this is unnecessary. In obstinate eruptions, glandular swelling, obstinate sores, &c.; also as an injection.

2. (Good.) Corrosive sublimate, 1 dr.; sal ammoniac, 2 drs.; nitre, 4 drs.; water, 6 fl. oz.; dissolve. In itch, &c. For *use*, it should be diluted with about 3 times its bulk of water.

3. (LOTIO HYDRARGYRI AMYGDALINA—St. B. Hosp.) Blanched bitter almonds, 1 oz.; water, 1 pint; make an emulsion, and add of bichloride of mercury (dissolved in a little rectified spirit), 10 grs. This resembles GOWLAND'S LOTION, and may be used for it.

Lotion of Bismuth. LOTIO BISMUTHI. Nitrate of bismuth, 6 grs.; corrosive sublimate, ½ gr.; spirits of camphor, 1½ minim; water, 1 oz. A soothing lotion in chronic skin affections.

Lotion, Black. See MERCURIAL LOTION.

Lotion of Bo''rax. *Syn.* LOTIO BORACIS, L. BORACICA, L. *Prep.* 1. (Dr. Abercrombie.) Borax, 2½ drs.; distilled vinegar, ¼ pint. In ringworm.

2. (Copland.) Borax (in powder), 1 dr.; rose water and orange-flower water, of each, 3 fl. oz.; dissolve. A fragrant and effective application to sore gums, sore nipples, excoriations, &c.

3. (Dr. Johnson.) Borax, 2 drs.; precipitated chalk, 1 oz.; rose water and rectified spirit, of each, 3 oz. For sore nipples.

4. (Dr. Meigs.) Borax, ½ oz.; sulphate of morphia, 6 grs.; rose water, 8 fl. oz. To allay itching and irritation, especially pruritus vulvæ.

5. Borax, 1; rose water, 24. Cosmetic.

Lotion, Bro'mine. *Syn.* LOTIO BROMINII, L. *Prep.* (Dr. Glover.) Bromine, 1 dr.; water, 1 pint. As an application to scrofulous ulcers.

Lotion for Burns. See LINIMENT.

Lotion, Camphora'ted. See EVAPORATING LOTION.

Lotion of Cap'sicum. *Syn.* LOTIO CAPSICI, L. *Prep.* (Griffith.) Tinctures of capsicum and camphor, of each, 4 fl. oz.; liquor of ammonia, 2 fl. oz. A powerful rubefacient and counter-irritant.

Lotion of Car'bonate of So'da. *Syn.* LOTIO SODÆ CARBONATIS, L. *Prep.* From carbonate of soda, ½ oz.; water, 1 pint. To allay itching and irritation. See ALKALINE LOTION.

Lotion of Cher'ry Laurel. *Syn.* LOTIO LAURO-CERASI, L. *Prep.* 1. Cherry-laurel water (distilled), 1½ fl. oz.; distilled water, ½ pint. Anodyne; useful to allay irritation, &c. Some persons with delicate skin employ it as a wash after shaving.

2. Cherry-laurel water (distilled), 4 oz.; rectified spirit and ether, of each, 1 fl. oz.; extract of belladonna, 2 drs.; agitate well together in the cold. An excellent application in neuralgia, painful tumours, &c.

Lotion for Chilblains. See CHILBLAIN, LINIMENT, &c.

Lotion of Chlo''rate of Soda. *Syn.* LOTIO SODÆ CHLORATIS, L. *Prep.* (Darling.) Chlorate of soda, 5 drs.; water, ½ pint. In pruritus, &c.

Lotion of Chlo''ride of Ammonium. LOTIO

AMMONII CHLORIDI. Chloride of ammonium, 1 oz.; rectified spirit, 1 oz,; water, 10 oz. To this vinegar is sometimes added. *Used* as a dressing for bruises. See also LOTION OF HYDROCHLORATE OF AMMONIA.

Lotion of Chlo″ride of Lead. *Syn.* LOTIO PLUMBI CHLORIDI, L. *Prep.* (Tuson.) Chloride of lead, 1 dr.; hot distilled water, 1 pint; dissolve. In cancerous ulcerations, painful neuralgic tumours, &c.

Lotion of Chloride of Tin. *Syn.* LOTIO STANNI CHLORIDI, L. *Prep.* (Nauchè.) Chloride of tin, 1 gr.; distilled water, 2 to 3 fl. oz. In cancerous ulcerations.

Lotion of Chloride of Zinc. *Syn.* LOTIO ZINCI CHLORIDI, L. *Prep.* 1. Chloride of zinc, 10 grs. (or solution, ½ fl. dr.); water, 1 pint. As a disinfectant and preventive lotion.

2. (Voght.) Chloride of zinc, 8 grs.; extract of aloes, 40 grs.; distilled water, 4 fl. oz. In atonic and foul ulcers.

Lotion, Chlorina′ted. *Syn.* LOTIO CHLORINATA, L. *Prep.* 1. (LOTIO CALCIS CHLORINATÆ.)—*a.* From chloride of lime, 3 drs.; water, 1 pint; agitate together for some time, and strain through muslin.

b. (Derheims.) Chloride of lime, 1 oz.; water, 1 quart; triturate and filter.

2. (LOTIO SODÆ CHLORINATÆ.) From chloride of soda, as the last. They are both excellent washes for foul ulcers, the itch, &c.; and, when diluted, for the teeth, to sweeten the breath, remove the smell of tobacco smoke, to prevent infection, and for various purposes. When intended for application to very tender or abraded surfaces, they must be largely diluted with water.

Lotion of Chlo″roform. *Syn.* LOTIO CHLOROFORMI, L. *Prep.* Chloroform (pure), 1½ fl. oz.; rectified spirit and cold distilled water, of each, ½ pint. Anodyne. A piece of oiled silk should be laid over the rag to prevent evaporation. The lotion made with water, as commonly prescribed, is inert.

Lotion for Corns. See CORN.

Lotion of Cre′asote. *Syn.* LOTIO CREASOTI, L. *Prep.* 1. Creasote, 2 fl. drs.; liquor of potassa, 3 fl. drs.; water, ½ pint.

2. Creasote, 3 fl. drs.; vinegar and water, of each, ½ pint. In burns, itch, phagedenic ulcerations, ringworm, chancre, &c.

Lotion of Cy′anide of Potas′sium. *Syn.* LOTIO POTASSI CYANIDI, L. *Prep.* 1. (Cazenave.) Cyanide of potassium, 10 grs.; emulsion of bitter almonds, 6 fl. oz. In chronic eruptions and other cases attended with much itching or irritation.

2. (Foy.) Cyanide of potassium, 8 grs.; distilled water, 1 fl. oz. In neuralgia, acute rheumatism, &c.; applied by means of compresses of linen. Both the above are poisonous if swallowed.

Lotion of Delphin′ine. *Syn.* LOTIO DELPHINIÆ, EMBROCATIO D., L. *Prep.* (Dr. Turnbull.) Delphinine, 20 to 60 grs.; rectified spirit, 2 fl. oz. *Used* as LOTION OF VERATRIA.

Lotion of Diac′etate of Lead. *Syn.* GOULARD'S LOTION; LOTIO PLUMBI DIACETATIS, L. The dilute liquor of diacetate of lead (LIQ. PLUMBI DIACETATIS DILUTUS—Ph. L.), See SOLUTION. Also Solution of subacetate of lead (B. P.), 3 minims, with 7 minims to 1 oz. water.

Lotion, Evap′orating. *Syn.* LOTIO EVAPORANS, L. VAPORANS, L. SPIRITUS DILUTI, L. *Prep.* 1. (Copland.) Sulphuric ether, rectified spirit, and solution of acetate of ammonia, of each, 1½ fl. oz.; rose water, 3½ fl. oz.

2. (Guy's Hosp.) Rectified spirit, 1 part; water, 5 parts.

3. (Erasmus Wilson.) Rectified spirit, 1 part; water, 4 to 6 parts.

4. (CAMPHORATED — Ware.) Camphor, ½ dr.; elder flowers, ½ oz.; rectified spirit, 4 oz.; digest 24 hours, and strain.

Obs. The above are soothing and refrigerant, if allowed to evaporate by free exposure; stimulant, if the evaporation is prevented by covering the part with the hand, or a piece of oiled silk. They are useful applications in nervous headaches, restlessness, itching and irritability of the skin, &c. "A little rose water added to the simple water makes an agreeable addition, and sometimes camphor water (julep), or a little Goulard's extract, may be deemed advantageous, when a greater degree of calming effect is required." (Eras. Wilson.) Eau de Cologne, diluted with an equal quantity of water, is often used as an evaporating lotion.

Lotion of Gall-nuts. *Syn.* LOTIO GALLÆ, L. *Prep.* From gall-nuts (bruised), ½ oz.; boiling water, 1 pint; infuse until cold, and strain. Astringent. An excellent application to sore nipples, or to strengthen them before suckling; spirit of wine, 3 fl. oz., may be advantageously added to the cold infusion, and a like portion of water omitted. See DECOCTION.

Lotion of Glyc′erin. *Syn.* LOTIO GLYCERINI, L. GLYCERINIÆ, L. *Prep.* 1. Glycerin, 1 oz.; water, 1 pint. To allay itching, and remove dryness, &c., in various skin diseases; also in chaps of the nipples, lips, and hands. For the latter purpose the addition of 2 to 3 drs. of borax is recommended by some writers.

2. Glycerin, 1 oz.; thick mucilage, 2 oz.; lime water, 7 oz. In burns, scalds, chaps, excoriations, &c.

3. (Startin.) Glycerin, 1 oz.; extract of belladonna, 1 dr.; soap liniment, 3 oz.; triturate together. In bruises, sprains, and swelled joints; gouty, neuralgic, and rheumatic pains, &c.

4. (Startin.) Trisnitrate of bismuth, ½ dr.; tincture of foxglove and dilute nitric acid, of each, 1 fl. dr.; glycerin, 4 drs.; rose water, 8½ fl. oz. To allay the itching in prurigo, and some other skin diseases.

Obs. Various lotions may be prepared by dissolving active medicinal substances in glycerin.

Lotion, Goulard's. See LOTION OF DIACETATE OF LEAD.

Lotion, Gout. *Syn.* LOTIO ANTARTHRITICA, L. *Prep.* 1. Glycerin, 1 oz.; extract of belladonna, 3 drs.; veratrine, 10 grs., dissolved in rectified spirit, 2 fl. oz.; mix, and further add of water, 17 fl. oz. It is poisonous if swallowed.

2. ('SCUDAMORE'S G. L.') From camphor mixture, 9 fl. oz.; rectified spirit, 3 fl. oz. The above are applied on rags or compresses, or are poured on the surface of poultices.

Lotion, Gowland's. This celebrated nostrum is prepared as follows:—Take of Jordan almonds, 1 oz.; bitter almonds, ½ oz.; blanch them, and make an emulsion in soft water, 1 pint; to this add of bichloride of mercury, 15 grs., previously dissolved in rectified spirit, 2 fl. drs., together with enough water to make the whole measure 1 pint, and put it into bottles.

Obs. This preparation is chiefly used as a cosmetic to improve the complexion; and also as a wash for obstinate eruptions and minor glandular swellings and indurations. As a beautifier of the complexion, it is employed by simply wetting the skin with it, either by means of the corner of a napkin or the fingers dipped into it, after which it is gently wiped off with a dry cloth. Dr. Paris represents this nostrum to contain ½ dr. of corrosive sublimate in every pint, which is not the case.

Lotion, Granville's Counter-irritant. See LINIMENT OF AMMONIA (Compound).

Lotion, Hem'lock. *Syn.* LOTII CONII, L. *Prep.* (Mid. Hosp.) Extract of hemlock, 3 drs.; opium, 1 dr.; boiling water, 1 pint; digest until cold, and strain. Anodyne and resolvent; in glandular enlargements, painful ulcers, cancer, indurations, rheumatism, neuralgia, &c.

Lotion, Hooping Cough. (**Struve's**). LOTIO ANTIPERTUSSICA, L. *Prep.* (Paris.) Potassio-tartrate of antimony, 1 dr.; tincture of cantharides, 1 oz.; water, 2 oz. This is a powerful counter-irritant, and should be used with caution, as it is apt to induce a troublesome eruption on the parts to which it is frequently applied.

Lotion of Hydrochlo"rate of Ammonia. *Syn.* LOTIO AMMONIÆ HYDROCHLORATIS, L. *Prep.* 1. (WEAKER.) From sal ammoniac, 1 to 4 drs.; water, 1 pint. As a wash in itch, ulcers, tender feet, swelled joints, &c.

2. (STRONGER.) From sal ammoniac, 1 to 2 oz.; water, 1 pint. In contusions, chronic tumours, extravasations, chilblains, &c., when the skin is not broken. Both are stimulant and resolvent or discutient. Vinegar is often substituted for the whole or part of the water, and sometimes a fifth or sixth part of rectified spirit is added. See also LOTION OF CHLORIDE OF AMMONIUM.

Lotion, Hydrochlo"ric. *Syn.* LOTIO ACIDI HYDROCHLORICI, L. *Prep.* 1. Hydrochloric acid, 1 fl. oz.; water, 1 pint. In lepra, and several other skin diseases.

2. (Foy.) Hydrochloric acid, 1 part; water, 16 parts. In chilblains, when the skin is unbroken.

Lotion, Hydrocyan'ic. *Syn.* LOTIO HYDROCYANICI, L. ACIDI HYDROCYANICI, L. *Prep.* 1. (Magendie.) Medicinal hydrocyanic acid, 1 to 2 fl. drs.; lettuce water, 1 pint. In hepatic affections.

2. (Sneider.) Medicinal acid, 1½ fl. dr.; rectified spirit and water, of each, 6 fl. oz.

3. (A. T. Thomson.) Medicinal acid and rectified spirit, of each, 2 fl. drs.; acetate of lead, 16 grs.; distilled water, 7½ fl. oz. In impetigo, &c.

Obs. Lotions of prussic acid are employed to allay pain and irritation in various chronic skin diseases, especially the scaly and itchy eruptions; and in cancer, &c., with variable success. See HYDROCYANIC ACID.

Lotion of Hyposul'phite of Soda. *Syn.* LOTIO SODÆ HYPOSULPHITIS, L. *Prep.* (Startin.) Hyposulphite of soda and alum, of each, 1½ dr.; eau de Cologne, ½ fl. oz.; rose water, 7½ fl. oz. In the advanced stages of acne.

Lotion of I'odide of Ar'senic and Mer'cury. *Syn.* LOTIO ARSENICI ET HYDRARGYRI HYDRIODATIS, L. *Prep.* From Donovan's solution, 1 part; water, 9 parts. In lepra, psoriasis, and other scaly skin diseases. See SOLUTION.

Lotion of Iodide of Potas'sium. *Syn.* LOTIO POTASSII IODIDI, L. *Prep.* 1. From iodide of potassium, 1 to 2 drs.; water, 1 pint. In the usual cases in which iodurctted preparations are employed.

2. (Dr. O. Ward.) Iodide of potassium, 1 dr.; water, ¾ pint. In itch. (See *below*.)

Lotion of Iodide of Zinc. *Syn.* LOTIO ZINCI IODIDI, L. *Prep.* (Ross.) Iodine, 1½ dr.; zinc filings, 1 dr.; water, 8 fl. oz.; digest with heat until the liquid becomes coloured, then filter. In enlarged tonsils.

Lotion of I'odine. *Syn.* LOTIO IODINII, L. *Prep.* From iodine, 2 grs.; rectified spirit, 1 fl. dr.; dissolve, well agitate the solution with distilled water, 1 pint, and filter. An excellent wash for scrofulous ulcers, and in chronic ophthalmia, cutaneous scrofula, and several chronic skin diseases, particularly in highly sensitive habits.

Lotion, Compound, of Iodine. *Syn.* LOTIO IODI COMP., L. *Prep.* 1. Iodide of potassium, 80 grs.; iodine, 60 grs.; water, 1 oz.

2. (Cazenave.) Iodide of potassium and iodide of sulphur, of each, 1 dr.; water, 1 pint. In itch; either alone or diluted with an equal bulk of water.

3. (Dauvergne.) Iodine, 3 drs.; iodide of potassium, 6 drs.; water, 3 fl. oz.; dissolve, and label the bottle No. 1. Sulphuret of potassium, 4 oz.; water, 8 fl. oz.; dissolve. For use, a tea-spoonful of No. 1, and a table-spoonful of No. 2, are to be added to about a pint of water. In itch, and several other skin diseases.

4. (Lugol.) Iodine, 1 to 2 grs.; iodide of potassium, 3 to 6 grs.; water, 1 pint. In scro-

fulous ophthalmia, fistulas, &c.; and as a wash in numerous skin diseases.

5. (Righini.) Chloride of lime, 4 drs.; water, 2½ fl. oz.; triturate together, filter into a stoppered bottle, and add of tincture of iodine, 1 dr. With a pint of water, it forms an effective application in itch.

6. (Soubeiran.) Iodide of patassium, 1 oz.; iodine, ½ oz.; water, 6 oz.; dissolve. *Used* as iodine paint; also as a caustic to touch the surfaces of scrofulous ulcers, and the eyelids in scrofulous ophthalmia.

7. Iodide of potassium, ½ dr.; iodine, 16 grs.; water, 1 pint. This is the common and best form of iodine lotion, but for certain purposes it is used much stronger. (See *above*.)

Lotion of Iron with Conium. LOTIO FERRI CUM CONIO. Sulphate of iron, 8 grs.; extract of conium, 8 grs.; water, 1 oz.

Lotion, Itch. *Syn.* LOTIO ANTIPSORICA, L. *Prep.* (Cazenave.) Sulphuret of potassium, 1 dr.; soft soap, 2 drs.; water, 8 fl. oz.; dissolve. An excellent remedy for the itch. It leaves little smell behind, and does not soil the linen. (See *above*.)

Lotion, Kirkland's. See LOTION OF MYRRH.

Lotion of Lemon Juice. *Syn.* LOTIO SUCCI LIMONIS, L. *Prep.* From the freshly expressed juice of lemon, diluted with 4 or 5 times its bulk of water. To render it more agreeable, rose water may be employed, or a few drops of eau de Cologne added. It is cooling and detergent, and forms an excellent application to foul ulcers, and to allay the itching in numerous cutaneous affections.

Lotion of Lime Wa'ter. *Syn.* LOTIO CALCIS SPIRITUOSA, L. *Prep.* (Ph. Chirur.) Rectified spirit, 4 oz.; lime water, 8 fl. oz. See EVAPORATING LOTION (*above*).

Lotion, Mammil'lary. *Syn.* LOTIO BALSAMI PERUVIANI COMPOSITA, L. *Prep.* (Iverg.) Balsam of Peru, 1 dr.; yolk of 1 egg; make an emulsion, and add of spirit of wild thyme, 3 fl. oz. For sore nipples; to be followed, whilst still wet, by a 'dusting' with a powder composed of Peruvian bark, 1 dr.; gum arabic, 2 drs.

Lotion, Mercu''rial. *Prep.* 1. (BLACK WASH, BLACK LOTION, MILD PHAGEDENIC L.; LOTIO NIGRA (B.P.), L. HYDRARGYRI CINEREA, L. H. NIGRA, L. H. CHLORIDI CUM CALCE, L. MERCURIALIS N., AQUA PHAGEDÆNICA MITIS, L.) —*a.* (B.P.) From calomel, 3 grs.; lime water, 1 oz.; well shaken together.

b. (Mid. Hosp.) To the last add of thick mucilage, 1 fl. oz.

c. (Guy's Hospital.) From calomel, 1 dr., to lime water, 8 fl. oz.

Obs. Black wash is a favourite application to all kinds of syphilitic and scrofulous sores. The bottle should be well shaken before the lotion is applied.

2. YELLOW WASH, Y. LOTION, PHAGEDENIC L.; LOTIO FLAVA, L. PHAGEDÆNICA, AQUA P., L[illegible]RARGYRI FLAVA, L. H. BICHLORIDI CUM CALCE, L.)—*a.* (B. P.) Corrosive sublimate, 18 grs.; lime water, 10 oz.; well shaken together.

b. (St. B. Hosp.) Corrosive sublimate, 20 grs.; lime water, 6 fl. oz. *Used* as the last, but it is stronger and more active, from containing a little undecomposed bichloride.

Lotion of Myrrh. *Syn.* KIRKLAND'S LOTION; LOTIO MYRRHÆ, L. *Prep.* 1. (Dr. Kirkland.) Tincture of myrrh and lime water, equal parts. In scorbutic ulcers and gums.

2. (Compound; LOTIO MYRRHÆ COMPOSITA, L.—Ph. Chirur.) Honey of roses and tincture of myrrh, of each, 2 fl. drs.; lime water, 2½ fl. oz. As No. 1; also used as a dentifrice.

Lotion of Ni'trate of Bis'muth. *Syn.* LOTIO BISMUTHI NITRATIS, L. *Prep.* (Cutan. Hosp.) Subnitrate or trisnitrate of bismuth, ½ dr.; corrosive sublimate, 12 grs.; spirit of camphor, ½ fl. dr.; water, 1 pint. In itch, and some other eruptions.

Lotion of Nitrate of Sil'ver. *Syn.* LOTIO ARGENTI NITRATIS, L. *Prep.* 1. Nitrate of silver, 15 grs.; nitric acid, 10 drops; distilled water, ½ pint. As a wash for indolent ulcers, sore legs, &c.

2. (Jackson.) Nitrate of silver, 10 grs.; water, 1 fl. oz. For bed-sores; applied, at first, twice or thrice a day.

3. (Schreider.) Nitrate of silver, ½ dr.; nitric acid, 10 drops; water, 1½ fl. oz. In chilblains, soft corns, &c.

Lotion of Nitrate of Silver (Strong.) LOTIO ARGENTI NITRATIS FORTIS. Nitrate of silver, 60 grs.; distilled water, 1 oz.

Lotion, Etherial, of Nitrate of Sil'ver. LOTIO ARGENTI NITRATIS ÆTHEREA. Nitrate of silver, 20 grs.; distilled water, 1 dr.; spirit of nitrous ether, 1 oz.

Lotion of Ni'tre. *Syn.* LOTIO POTASSÆ NITRATIS, L. *Prep.* 1. Nitre, 3 drs.; vinegar, ¼ pint; water, ¾ pint.

2. Nitre, 2 drs.; sal ammoniac, 1 dr.; vinegar and water, of each, ½ pint. In sprains, contusions, extravasations, tender feet, chilblains, &c. Diluted with an equal bulk of water, it is a popular application to 'black eyes.'

Lotion of Ni'tric Acid. *Syn.* LOTIO ACIDI, L. ACIDI NITRICI, L. *Prep.* 1. (Collier.) Nitric acid, ½ fl. oz.; water, 1 pint. In lepra, and other scaly skin diseases.

2. (Phœbus.) Nitric acid, 1 fl. dr.; laudanum, 1½ fl. dr.; rose water, ½ pint. For venereal ulcers.

Lo'tion of Nitromuriat'ic Acid. *Syn.* LOTION OF AQUA REGIA. *Prep.* (Copland.) Nitromuriatic acid, 1¼ dr.; water, 1 pint. In gangrene and mortification.

Lotion of Nux Vom'ica. *Syn.* LOTIO NUCIS VOMICÆ, L. *Prep.* 1. Alcoholic extract of nux vomica, 10 grs.; rectified spirit and water, of each, 2½ fl. oz. In amaurosis.

2. (Radius.) Alcoholic extract of nux vomica, 8 grs.; liquor of ammonia (stronger),

½ fl. oz.; rectified spirit, 2 fl. oz. In paralysed limbs.

Lotion of O'pium. *Syn.* LOTIO OPII, L. OPIATA, L. *Prep.* 1. (Christison.) Opium, 40 grs.; water, ¼ pint; infuse, add to the filtered liquid a solution of sugar of lead, 40 grs., in water, ¼ pint, and filter.

2. (St. B. Hosp.) Opium, 1½ dr.; boiling water, 1 pint; triturate and strain. Anodyne; the first is also refrigerant and discutient.

Lotion of Ox''ide of Zinc. *Syn.* LOTIO ZINCI OXYDI, L. *Prep.* 1. (Augustin.) Oxide of zinc, 1 dr.; elder-flower water, 1½ fl. oz. In pustular erysipelas.

2. (Hosp. F.) Oxide of zinc, ½ dr.; mucilage, 2 fl. drs.; water, 6 fl. drs. As an astringent and desiccant, in scrofulous eruptions, excoriations, moist chaps, &c.

Lotion, Phageden'ic. See MERCURIAL LOTION (*above*).

Lotion of Phosphor'ic Acid. *Syn.* LOTIO ACIDI PHOSPHORICI, L. *Prep.* (Pereira.) Dilute phosphoric acid (Ph. L.), 1 fl. oz.; water, ½ pint. In caries and fistula.

Lotion of Potas'sa. See. LOTIO POTASSÆ, L. *Prep.* From liquor of potassa, 1 fl. oz.; water, 1 pint. Detergent; in scorbutic eruptions, and foul ulcers, and to prevent infection.

Lotion of Potas'sio-tar'trate of An'timony. *Syn.* LOTIO ANTIMONIALIS, L. ANTIMONII POTASSIO-TARTRATIS, L. RUBEFACIENS, L. *Prep.* 1. Tartar emetic, 1 dr.; tincture of camphor, 2 fl. drs.; water, 1 pint. As a local stimulant. Diluted with twice or thrice its weight of water, it is employed as a collyrium in chronic ophthalmia, and in specks on the cornea.

2. (Sir Wm. Blizard.) Tartar emetic, 20 grs.; boiling water, 1 fl. oz. *Used* to cleanse foul ulcers, to repress fungous growths and warts, and in ring-worm, &c.

3. (Pereira.) Tartar emetic, 1 dr.; boiling water, 1½ fl. oz.; dissolve. Employed as a local irritant instead of the ointment. All the above are rubefacient and counter-irritant. See ANTIMONY.

Lotion of Quin'ine. *Syn.* LOTIO QUINÆ, EMBROCATIO Q., L. *Prep.* From disulphate of quinine, 1 dr.; rectified spirit, 5 fl. oz. Applied over the spine in intermittents.

Lotion, Sapona'ceous. *Syn.* LOTIO SAPONIS, L. SAPONACEA (Ph. L. 1746), L. *Prep.* From liquor of carbonate of potassa, ½ oz.; olive oil, 4 oz.; rose water, 12 oz.; agitate together. Emollient; chiefly as a cosmetic.

Lotion, Saviard's. *Prep.* (Foy.) Caustic potassa, 1 dr.; camphor, 20 grs.; sugar, 1 oz.; water, 1 pint. As a wash for indolent ulcers.

Lotion, Struve's. See HOOPING COUGH LOTION.

Lotion of Sul'phate of Cop'per. *Syn.* LOTIO CUPRI SULPHATIS, L. *Prep.* 1. Blue vitriol, 1 dr.; camphor julep, 1 pint. For phagedenic ulcers, and in itch, &c.

2. (Dr. Graves.) Sulphate of copper, 10 grs.; water, 1 fl. oz. In chilblains, ring-worm &c.

3. (Lloyd.) Sulphate of copper, 1 oz.; water, 1 pint. In itch; either alone or diluted.

Lotion of Sul'phate of Iron. *Syn.* LOTIO FERRI SULPHATIS. Sulphate of iron, 2 grs.; water, 1 oz.

Lotion of Sul'phate of Zinc. *Syn.* LOTIO ZINCI SULPHATIS, L. *Prep.* 1. Sulphate of zinc, ¾ dr.; water, 1 pint. Astringent; in some chronic skin diseases, as a wash for loose, flabby granulations, and for ulcers that discharge profusely, &c.

2. (Collier.) Sulphate of zinc, 2 drs.; water, 1 pint. As a counter-irritant in pains of the joints, periosteum, old sprains, &c.

Lotion of Tar. *Syn.* LOTIO PICIS LIQUIDÆ, L. *Prep.* (Saunders.) Quicklime, 6 oz.; water, 2½ pints; slake, add of tar, 4 oz., and boil to one half. This liquid may be advantageously employed in various chronic skin diseases, especially those affecting the heads of children. See INFUSION OF TAR, &c.

Lotion of Valer'ian. *Syn.* LOTIO VALERIANÆ, EMBROCATIO ANTIHYSTERICA, E. EMMENAGOGA, L. *Prep.* From tincture of valerian and proof spirit, equal parts. In hysteria, suppressions, &c.

Lotion of Vera'trine. *Syn.* LOTIO VERATRIÆ, L. *Prep.* (Dr, Turnbull.) Veratrine, 20 to 60 grs.; rectified spirit, 2 oz. In gout, rheumatism, &c. It is extremely poisonous, and must only be used where the skin is sound, and then with great caution.

Lotion of Ver'digris. *Syn.* LOTIO ÆRUGINIS, L. CUPRI CITRATIS, L. *Prep.* From verdigris, 3 drs.; vinegar, ¼ pint; water, ¾ pint. As a wash for indolent scrofulous and venereal ulcers.

Lotion of Vin'egar. See ACETIC LOTION (*above*).

Lotion, Yel'low. See MERCURIAL LOTION (*above*).

LOZ'ENGE. *Syn.* TROCHE; TROCHISCUS, TABELLA, L.; TABLETTE, Fr. A small cake, often medicated, consisting principally of powdered sugar, made into a mass with some glutinous liquid, without the aid of heat, and dried. The form given to lozenges (TROCHES; TABELLÆ, TROCHISCI, TABLETTES) is generally that of a small round tablet or flattened cylinder; but originally they were exclusively made in the shape of a lozenge or rhomb, from which circumstance their familiar name is derived. LOZENGES are distinguished from DROPS or PASTILLES by the non-employment of heat in their preparation; and from PASTES, by the latter being formed of vegetable juice or pulp, and having a softer consistence.

In the preparation of lozenges the dry ingredients, separately reduced to a very fine powder, are first perfectly mixed together, and then beaten into a stiff paste with the glutinous liquid employed to give them form; the mass is next rolled out to a desired thickness, and cut into pieces of the proper shape by means of a small cylinder or punch of steel or tin-plate, called a 'lozenge-cutter.' The newly formed lozenges are lastly dried by placing them on an inverted sieve or frame covered with paper in a dry, warm, and airy situation, and are frequently turned until they become hard and brittle, due care being taken to preserve them from dust and dirt. To prevent the mass adhering to the fingers and utensils during the process of manufacture, a little finely powdered starch, or a very little olive oil, scented with the same aromatic as that contained in the lozenges, may be used. Mucilage of gum arabic or of gum tragacanth, thin isinglass size, or the strained white of egg, are the substances usually employed to make the pulverulent materials adhere together. A strained decoction of Irish moss is now frequently used for the same purpose, for inferior qualities. The larger the proportion of gum which enters into the composition of lozenges, the slower they dissolve in the mouth; hence powdered gum is frequently added to the other materials to increase their quality in this respect, as well as to give additional solidity to those which, like chalk, for instance, are of a peculiarly dry or crumbly nature. Starch and potato flour are often added to lozenge-masses in lieu of a portion of the sugar, and even plaster of Paris is not unfrequently employed to give them weight; frauds which are readily detected in the manner noticed under Gum and Sugar.

As a general rule, MEDICATED LOZENGES should weigh from 8 to 10 grs. each, and a medium dose of their active ingredient should be distributed through the bulk of 6 to 8 of them, in which case 3 to 5 of them may be safely taken as a dose, or sucked during the lapse of 3 or 4 hours. This will be useful in the preparation of those for which no established proportions are given. In 'sending out' compounds of this class containing active medicaments, as morphia or opium, the retailer as well as the manufacturer should be careful that the quantity contained in each lozenge is plainly marked on the label.

In lozenges intended for MOUTH COSMETICS, or to perfume the breath, ambergris is generally regarded as the most appropriate perfume; but hard smokers frequently prefer cloves and cinnamon, and some ladies give the preference to roses, orange flowers, and orris or violets.

Lozenges are coloured with the same stains as are used for liqueurs and sweetmeats.

Lozenges, as well as all other similar articles of confectionery, should be preserved in well-closed glass bottles, or jars, or in tin canisters, so as to be perfectly excluded from the air and damp.

Lozenges, Absor'bent. TROCHISCI ANTACIDI, L. *Prep.* 1. Take of precipitated chalk, ½ lb.; gum arabic, 2 oz.; double refined white sugar, 14 oz.; all in impalpable powder; oil of nutmeg, ½ fl. dr.; pass the mixture through a fine sieve, beat it up with mucilage, q. s., roll the mass into a thin sheet, and cut it into lozenges; lastly, dry them by exposing them on a sheet of white paper to the air, out of contact with dust.

2. As the last, but substituting heavy carbonate of magnesia, 1½ oz., for an equal weight of chalk. In diarrhœa, heartburn, acidity, &c. See Chalk Lozenges, Magnesia L., Soda L., &c.

Lozenges, Aca'cia. See Gum Lozenges.

Lozenges, Acid'ulated. *Syn.* ACIDULATED LEMON LOZENGES, TARTARIC ACID L.; TROCHISCI ACIDI TARTARICI (Ph. E.), L. *Prep.* From tartaric acid, 2 drs.; oil of lemon, 10 drops; white sugar, 8 oz.; mucilage, q. s. to make a lozenge-mass. The same ingredients mixed with heat form ACIDULATED or ACID DROPS. Both are useful in coughs, hoarseness, sore throats, &c. See Cayenne Lozenges, Citric Acid L., Rose L., &c.

Lozenges, Al'kaline. See Soda Lozenges, Vichy L., &c.

Lozenges, Al'um. *Syn.* TROCHISCI ALUMINIS, L. Each lozenge contains 1½ gr. of alum. As an astringent. See Astringent Lozenges.

Lozenges, An'iseed. *Syn.* TROCHISCI ANISI, L. *Prep.* From oil of aniseed, 1½ fl. dr.; finest white sugar, 1 lb.; mucilage, q. s. Carminative and stomachic. In colic, griping, &c.; and as a pectoral.

Lozenges, Anthelmin'tic. See Worm Lozenges.

Lozenges, Antimonial. *Syn.* TROCHISCI ANTIMONIALES, MORSULI STIBII KUNKELII, L.; TABLETTES DE KUNKEL, Fr. *Prep.* (P. Cod.) Levigated sulphuret of antimony and cardamom seeds, of each, 1 oz.; almonds (blanched), 2 oz.; cinnamon, ½ oz.; sugar, 13 oz.; mucilage of tragacanth, q. s.; to be divided into 15-gr. lozenges. As an alterative.

Lozenges, Ape"rient. *Syn.* TROCHISCI APERIENTES, L. Each lozenge contains 1 gr. each of calomel and scammony, and 2 grs. of jalap; or, instead of the last, ¼ gr. of jalapine. 2 to 3 for a dose.

Lozenges, Astrin'gent. *Syn.* TROCHISCI ASTRINGENTES, L. Each lozenge contains 1½ gr. of alum and 2 grs. of catechu. In spitting of blood, relaxed uvula, sore throat, &c. See Alum Lozenges.

Lozenges, Bark. *Syn.* TROCHISCI CINCHONÆ, L. *Prep.* (P. Cod.) Cinchona, 2 oz.; cinnamon, 2 drs.; white sugar, 14 oz.; mucilage of gum tragacanth, q. s.; mix, and divide into 16-gr. lozenges. Tonic.

Lozenges, Bath. *Syn.* DAWSON'S LOZENGES. From extract of liquorice and gum arabic, of each, 1½ oz.; sugar, 17 oz. It is both rolled into lozenges and formed into pipes. Demulcent; in tickling coughs, &c.

Lozenges, Bicarbonate of Soda. TROCHISCI SODÆ BICARBONATIS. Bicarbonate of soda, in powder, 3600 grs. (8½ oz.); refined sugar, 25 oz.; gum acacia, in powder, 1 oz.; mucilage, 2 oz.; distilled water, 1 oz.; mix, and form in 720 lozenges. Each lozenge contains 5 grs. of bicarbonate of soda.—*Dose.* 1 to 6 lozenges.

Lozenges, Bis'muth. *Syn.* TROCHISCI BISMUTHI, L. *Prep.* 1. (B. P.) Subnitrate of bismuth, 346 grs.; carbonate of magnesia, 4 oz.; precipitated chalk, 6 oz.; sugar, 29 oz.; gum acacia, 1 oz.; mucilage, 2 oz.; rose water, a sufficiency; make 720 lozenges. Each lozenge contains 2 grains of subnitrate of bismuth.—*Dose.* 1 to 6 lozenges.

2. (Trousseau.) Each lozenge contains 1 gr. of subnitrate of bismuth. Tonic and antispasmodic; in chronic dyspepsia, gastrodynia, nausea, cramp of the stomach, &c.

Lozenges, Black Cur'rant. TROCHISCI RIBIS NIGRI, L. *Prep.* From inspissated juice of black currants and sugar, of each, in powder, 1 lb.; tartaric acid, ¼ oz.; mucilage, q. s. In hoarseness, &c.

Lozenges, Bo''rax. *Syn.* TROCHISCI BORACIS, L. Each lozenge contains 3 grs. of borax. One occasionally in aphthous sore mouth, sore throat, &c.

Lozenges, Bromide of Ammonium. Each lozenge contains 2 grs. of bromide of ammonium.—*Dose.* 1 to 3 lozenges.

Lozenges, Burnt Sponge. *Syn.* TROCHISCI SPONGIÆ, T. S. USTÆ, L. *Prep.* (P. Cod.) Burnt sponge, 4 oz.; sugar, 12 oz.; mucilage of tragacanth, q. s.; divide into 12-gr. lozenges. In scrofula, glandular enlargements, &c.

Lozenges, Caca'o. *Syn.* TROCHISCI BUTYRI CACAO, L. Each lozenge contains 1-3rd of its weight of pure cacao butter. In habitual constipation; and in phthisis, scrofula, &c., instead of cod-liver oil; taken *ad libitum.* They are usually scented with roses.

Lozenges, Caffe'ine. *Syn.* TROCHISCI CAFFEINÆ, L. Each lozenge contains ¼ gr. of caffeine and ½ gr. of citric acid. In hemicrania, hypochondriasis, &c.

Lozenges, Cal'omel. *Syn.* WORM LOZENGES; TROCHISCI CALOMELANOS, T. HYDRARGYRI CHLORIDI, L. *Prep.* (P. Cod.) Each lozenge contains 1 gr. of calomel. Alterative, &c. They afford a simple way of introducing mercury into the system. During their use, salt food and acid liquors should be avoided. When given for worms, they should be followed, in a few hours, by a purge.

Lozenges, Cam'phor. *Syn.* TROCHISCI CAMPHORÆ, L. Each lozenge contains ¾ gr. of (finely powdered) camphor. They must be kept in a well-corked bottle.

Lozenges, Car'bonate of Lime. See CHALK LOZENGES.

Lozenges, Cat'echu. *Syn.* CACHOU LOZENGES; TROCHISCI CATECHU (B. P.), T. DE TERRA JAPONICA, L.; TABLETTES DE CACHOU, Fr. *Prep.* 1. (Ph. E. 1744.) Catechu, 2 oz.; tragacanth, ½ oz.; white sugar, 12 oz.; rose water, q. s.

2. (P. Cod.) Extract of catechu, 4 oz.; sugar, 16 oz.; mucilage of gum tragacanth, q. s.; for 10-gr. lozenges.

3. (TRO. CATECHU ET MAGNESIÆ—P. Cod.) Magnesia, 2 oz.; powdered catechu, 1 oz.; sugar, 13 oz.; mucilage of gum tragacanth (made with cinnamon water), q. s. to mix.

4. (PERFUMED.) See CACHOU AROMATISÉ and PASTILS.

5. (B. P.) Pale catechu, in powder, 720 grs.; refined sugar, in powder, 25 oz.; gum arabic, in powder, 1 oz.; mucilage, 2 oz.; distilled water, a sufficiency; divide into 720 lozenges. Each lozenge contains 1 gr. of catechu.—*Dose.* 1 to 3 lozenges.

Obs. All the above are taken in diarrhœa, in relaxation of the uvula, in irritation of the larynx, and as cosmetics to fasten the teeth, and disguise a fetid breath. The one containing magnesia (No. 3) is also sucked in dyspepsia, acidity, and heartburn.

Lozenges, Cayenne'. *Syn.* TROCHISCI CAPSICI, L. Flavoured with essence or tincture of capsicum or cayenne, with a very concentrated Chili vinegar, or a little pure soluble cayenne pepper.

2. (ACIDULATED.) To each lb., add of tartaric acid, ½ oz. Both are used in dyspepsia, and to promote digestion and create an appetite. They have also been recommended in temporary deafness arising from exposure to cold. They are generally tinged of a light pink or red colour.

Lozenges, Chalk. *Syn.* HEARTBURN LOZENGES; TROCHISCI CRETÆ (Ph. E.), T. CARDIALGICI, TABELLÆ CARDIALGICÆ, L. *Prep.* (Ph. E.) Prepared chalk, 4 oz.; gum arabic, 1 oz.; nutmeg, 1 dr.; white sugar, 6 oz.; rose or orange-flower water, q. s. Antacid and absorbent. 3 or 4 sucked *ad libitum;* in heartburn, dyspepsia, diarrhœa, acidity of the stomach and bowels, &c.

Lozenges, Char'coal. *Syn.* TROCHISCI CARBONIS, L. *Prep.* 1. (P. Cod.) Prepared charcoal, 4 oz.; white sugar, 12 oz.; mucilage, q. s. to mix. In diarrhœa, cholera, dyspepsia, &c.

2. (TRO. CARBONAS CUM CHOCOLATÂ—M. Chevallier.) Charcoal and white sugar, of each, 1 oz.; chocolate, 3 oz.; mucilage of gum tragacanth, q. s. to mix. Nutritious; used as the last.

Lozenges, Ching's Worm. *Prep.* 1. (YELLOW.) From saffron, ½ oz.; boiling water, 1 pint; infuse, strain, add of calomel, 1 lb.; powdered white sugar, 28 lbs.; mix well, make a mass with mucilage of tragacanth, and divide it into 7000 lozenges. Each lozenge contains 1 gr. of calomel.

2. (BROWN.) From calomel, 7 oz.; resinous extract of jalap, 3½ lbs.; white sugar, 10 lbs.; mucilage of tragacanth, q. s.; mix, and divide into 6125 lozenges. Each lozenge contains ½ gr. of calomel and 8½ grs. of resinous extract of jalap. 1 to 6 of the yellow lozenges over night, as a vermifuge, followed by an e

number of the brown ones the next morning fasting.

Lozenges, Chlo″rate of Potassa. *Syn.* Trochisci potassæ chloratis, L. *Prep.* 1. Each lozenge contains 1½ gr. of chlorate of potassa. In phthisis, sore throat, &c. 6 to 12 a day.

2. (B. P.) Chlorate of potash, in powder, 3600 grs. (8¼ oz.); refined sugar, in powder, 25 oz.; gum acacia, in powder, 1 oz.; mucilage, 2 oz.; distilled water, 1 oz., or a sufficiency; mix the powders, and add the mucilage and water to form a proper mass; divide in 720 lozenges. Each lozenge contains 5 grs. of chlorate of potash.—*Dose.* 1 to 6 lozenges.

Lozenges, Chloride of Ammonium. Each lozenge contains 2 to 3 grs. of chloride of ammonium. *Used* in bronchitis.—*Dose.* 2 to 4 lozenges.

Lozenges, Chlo″ride of Gold. 1. (Trochisci auri chloridi, L.) Each lozenge contains $\frac{1}{40}$ gr. of neutral chloride of gold. 2 to 4 daily; in scrofula, cancer, &c.

2. (With soda; Trochisci auri et sodii chloridi, T. sodii auro-chloridi, L.—Chrestien.) Each lozenge contains $\frac{1}{16}$th gr. of soda-chloride of gold. Two daily; as the last.

Lozenges, Chloride of Lime. *Syn.* Trochisci calcis chloridi, T. c. chlorinatæ, L. Each lozenge contains ½ gr. of dry chloride of lime. They are frequently tinged with a little carmine. *Used* to sweeten the breath, and whiten the teeth. They do not keep well.

Lozenges, Choc′olate. *Syn.* Trochisci chocolatæ, L. From vanilla chocolate pressed into sheets, and cut into pieces whilst hot.

Lozenges, Cincho′na. *Syn.* Trochisci cinchonæ extracti, L. Each lozenge contains 1½ gr. of dry extract of bark. A little cinnamon or nutmeg is often added. See Bark Lozenges.

Lozenges, Cin′namon. *Syn.* Trochisci cinnamomi, L. From cinnamon (in fine powder), 1 oz., or the essential oil, 1 fl. dr., to each lb. of sugar. Carminative and stomachic. Cassia lozenges are made in the same way, and are frequently substituted for them.

Lozenges, Cit′rate of Iron. *Syn.* Trochisci ferri citratis, L. Each lozenge contains 1½ gr. of ammonio-citrate of iron. As a mild chalybeate tonic. They are sometimes made with equal parts of sugar and vanilla chocolate.

Lozenges, Citrate of Magne′sia. *Syn.* Trochisci magnesiæ citratis, L. Each 15-gr. lozenge contains 5 grs. of pure citrate of magnesia. Laxative.

Lozenges, Cit′ric Acid. *Syn.* Trochisci acidi citrici, L. *Prep.* (P. Cod.) Citric acid, 3 drs.; sugar, 16 oz.; essence of lemon, 16 drops; mucilage of tragacanth, q. s.; mix, and divide into 12-gr. lozenges. In coughs, hoarseness, &c.

Lozenges, Clove. *Syn.* Trochisci caryophilli, L. From cloves (powdered along with sugar), 2 oz., or essential oil, 1 fl. dr., to each lb. of sugar. They are frequently coloured. Carminative and stomachic; also used as a restorative after fatigue, added to chocolate to improve its flavour, and sucked to sweeten the breath.

Lozenges, Cough. *Syn.* Pectoral lozenges, Pulmonic l.; Trochisci anticatarrhales, L. *Prep.* 1. (Black-currant lozenge-mass, 1 lb.; ipecacuanha (in very fine powder, 2 drs. For 12-gr. lozenges.

2. To the last add of powdered opium and camphor, 1½ dr.

3. To either No. 1 or 2 add of oil of aniseed, 1½ fl. dr.

4. (Tablettes de Tronchin.) From powdered gum arabic, 8 oz.; oil of aniseed, 16 drops; extract of opium, 12 grs.; kermes mineral, 1 dr.; pure extract of liquorice, 2 oz.; white sugar, 32 oz.; water, q. s.; mix, and divide into 10-gr. lozenges.

5. (Tablettes de Vandamme.) From benzoic acid, 1 dr.; orris powder, 2 drs.; gum arabic (powdered), 1 oz.; starch, 2 oz.; sugar, 16 oz.; water, q. s.; mix and divide into 15-gr. lozenges.

6. Each lozenge contains ½ gr. of lactucarium, $\frac{1}{8}$ gr. of powdered ipecacuanha, and $\frac{1}{12}$ gr. of powdered squills, together with $\frac{1}{3}$rd of their weight of pure extract of liquorice.

Obs. To render the above serviceable in coughs, hoarseness, &c., the bowels should be kept gently open with some mild aperient, and a light diet adopted, with abstinence from stimulating liquors. See Emetine Lozenges, Ipecacuanha L., &c.

Lozenges, Cro′ton Oil. *Syn.* Trochisci crotonis, L. *Prep.* (Soubeiran.) Croton oil, 5 drops; powdered starch, 40 grs.; white sugar, 1 dr.; chocolate, 2 drs.; divide into 30 lozenges; 5 or 6 generally prove cathartic.

Lozenges, Cu′bebine. *Syn.* Trochisci cubebini, L. *Prep.* (Ph. Hamb.) Copaiba and extract of cubebs, of each, 6 oz.; yolks of 3 eggs; mix, add of powdered marshmallow root, 6 oz.; make it into pipes of 12 grs. each, and roll them in sugar. In gleet, &c., and in affections of the mucous membranes of the throat and fauces. Lablonye orders them to be made of sugar, and flavoured with oil of peppermint.

Lozenges, Cu′bebs. *Syn.* Trochisci cubebæ, L. *Prep.* (Spitta.) Cubebs, 2 drs.; balsam of tolu, 6 grs.; mix, and add of extract of liquorice, 1 oz.; syrup of tolu, 1 dr.; powdered gum, q. s.; divide into 10-gr. lozenges. One of these, allowed to melt gradually in the mouth, is said to alleviate the obstruction in the nose, in coryza.

Lozenges, D'Arcet's. See Vichy Lozenges.

Lozenges, Diges′tive. See Rhubarb Lozenges, Ginger L., Digestive Candy, &c.

Lozenges, Edinburgh. *Prep.* From extract of poppies, 2 oz.; powdered tragacanth, 4 oz.; sugar, 10 oz.; rose water, q. s. to form a lozenge mass.

Lozenges, Em′etine. *Syn.* TROCHISCI EMETINÆ, L. *Prep.* (Magendie.)—1. From impure or coloured emetine, 32 grs. (or pure emetine, 8 grs.); white sugar, 2 oz.; mucilage, q. s. to mix; divide into 64 lozenges. Emetic. —*Dose.* 1 for a child, and 4 for an adult. They are generally tinged of a pink colour with carmine.

2. From impure or coloured emetine, 32 grs. (or pure emetine, 8 grs.); sugar, 4 oz.; mucilage, q. s.; divide inio 256 lozenges. Pectoral. 1 every hour, or oftener, for an adult. The last are intended to take the place of ipecacuanha lozenges, but are rather stronger.

Lozenges, Escharot′ic. *Syn.* TROCHISCI ESCHAROTICI, L. *Prep.* (P. Cod.) Corrosive sublimate, 2 drs.; starch, 4 drs.; mucilage of tragacanth, q. s.; mix, and divide into 3-gr. oat-shaped granules. For external use only. See CAUSTIC (Zinc).

Lozenges, Ferrocy′anide of Iron. *Syn.* TROCHISCI FERRI FERROCYANIDI, T. CÆRULEI, L. Each lozenge contains 1½ gr. of pure Prussian blue. Alterative, febrifuge, and tonic; in epilepsy, intermittents, diseases of the ganglionic system, &c.

Lozenges, Fruit. *Prep.* From juice of black currants (boiled to the consistence of an extract), 1 lb.; juice of red currants (similarly treated), ½ lb.; powdered gum tragacanth, ¼ lb.; sugar, 3 lbs.; raspberry syrup, q. s.; pear essence, a few drops. Resemble black currant lozenges, but are more agreeable.

Lozenges, Garana′. See PAULLINIA LOZENGES.

Lozenges, Gin′ger. *Syn.* TROCHISCI ZINGIBERIS, L. *Prep.* From the best unbleached Jamaica ginger and gum arabic, of each, in very fine powder, 1½ oz.; double refined lump sugar, 1 lb.; rose water (tinged with saffron), q. s. A still finer quality may be made by using an equivalent proportion of essence of ginger, instead of the powder. Inferior qualities are prepared with coarser sugar, to which some starch is often added. Ginger lozenges are carminative and stomachic, and are useful in flatulency, loss of appetite, dyspepsia, &c.

Lozenges, Gold. *Syn.* TROCHISCI AURI, L. Each lozenge contains $\frac{1}{10}$ gr. of pulverulent gold.

Lozenges, Gum. *Syn.* TROCHISCI ACACIÆ (Ph. E.), T. GUMMI ARABICI, T. GUMMOSI, L. *Prep.* 1. (Ph. E.) Gum arabic, 4 oz.; starch, 1 oz.; white sugar, 12 oz.; (all in very fine powder;) rose water, q. s.

2. (P. Cod.) Gum arabic, 1 lb.; sugar, 3 lbs.; orange-flower water, 2 fl. oz.

3. (Transparent) From the same materials, but employing a gentle heat. Demulcent; used to allay tickling coughs.

Lozenges, Gum Tra′gacanth. *Syn.* TROCHISCI TRAGACANTHÆ, T. GUMMI T., L. *Prep.* (Ph. E. 1744.) Compound powder of tragacanth, 3 oz.; sugar, 12 oz.; rose water, 4 fl. oz. Resemble the last, but are more durable in the mouth.

Lozenges, Heart′burn. See CHALK LOZENGES, &c.

Lozenges, Iceland Moss. *Syn.* TROCHISCI LICHENIS, L. (P. Cod.) Contain half their weight of dried and powdered lichen jelly. Resemble gum lozenges.

Lozenges, Indian Hemp. *Syn.* TROCHISCI CANNABIS, T. C. INDICI, L. (Ebriard.) Each lozenge contains $\frac{1}{12}$ gr. of extract of Indian hemp.

Lozenges, I′odide of Iron. *Syn.* TROCHISCI FERRI IODIDI, L. Each lozenge contains ½ gr. of dry iodide of iron. 12 to 20 daily; in amenorrhœa, chlorosis, scrofulous debility, &c. They are generally flavoured with a little nutmeg or cinnamon.

Lozenges, Iodide of Potassium. *Syn.* TROCHISCI POTASSII IODIDI, L. Each lozenge contains 1 gr. of iodide of potassium, flavoured with nutmeg or cinnamon. 10 to 15 daily; in scrofula, indurations, &c. One of the best ways of taking iodide of potassium.

Lozenges, Ipecacuan′ha. *Syn.* TROCHISCI IPECACUANHÆ, L. *Prep.* 1. (P. Cod., Hamb. do., and Ph. U. S.) Each lozenge contains ¼ gr. of ipecacuanha.

2. (TRO. IPECAC. CUM CAMPHORÂ.) Each lozenge contains ½ gr. of camphor, and ¼ gr. of ipecacuanha.

3. (TRO. IPECAC. CUM CHOCOLATÂ—P. Cod.) Each lozenge contains 1 gr. of ipecacuanha, and 12 grs. of chocolate *à la vanille*. The above are pectoral and expectorant, and are very useful in tickling and chronic coughs, hoarseness, &c.

Lozenges, Ipecacuanha and Morphia. *Syn.* TROCHISCI IPECACUANHÆ ET MORPHIÆ. (B. P.) Each lozenge contains $\frac{1}{12}$ gr. ipecacuanha and $\frac{1}{36}$ gr. hydrochlorate morphia.—*Dose.* 1 to 6 lozenges. See MORPHIA AND IPECACUANHA LOZENGES.

Lozenges, I′ron. *Syn.* TROCHISCI FERRI, T. CHALYBEATI, L. 1. Each lozenge contains 1 gr. of Quevenne's iron. See LOZENGES, REDUCED IRON, p 724.

2. (TRO. FERRI CARBONATIS.) Each lozenge contains 1½ gr. of saccharine carbonate of iron. They are both mild and excellent chalybeates. See STEEL LOZENGES.

Lozenges, Ju′jube. See JUJUBE PASTE.

Lozenges, Ker′mes Mineral. *Syn.* TROCHISCI KERMETIS, L. *Prep.* 1. (P. Cod.) Each lozenge contains ⅛ gr. of kermes mineral, and about ¾ gr. of gum, made up with sugar and orange-flower water. Diaphoretic and expectorant.

2. (Compound.) As the last, but with the addition of ⅙ gr. of opium, ¼ gr. of squills, and ½ gr. of ipecacuanha. Anodyne and expectorant; both are very useful in catarrhs.

Lozenges, Lactate of Iron. *Syn.* TROCHISCI FERRI LACTATIS, L. *Prep.* (Cap.) Each lozenge contains 1 gr. of lactate of iron. Tonic. *Useful* in debility, accompanied with a diseased state of the organs of digestion.

Lozenges, Lac'tic Ac'id. *Syn.* TROCHISCI ACIDI LACTICI, L. Each lozenge contains 1 gr. of lactic acid to about 12 grs. of sugar. They are best flavoured with vanilla or nutmeg. In dyspepsia, &c., especially in gouty subjects. Those prepared by Magendie's formula contain a larger proportion of acid, but are much too sour for frequent use.

Lozenges, Lactuca''rium. *Syn.* TROCHISCI LACTUCARII, L. *Prep.* (Ph. E.) Prepared with lactucarium in the same manner as the opium lozenges, Ph. E. Each of these lozenges contains from ⅙ to ⅐ gr. of lactucarium. Anodyne and demulcent. *Used* to allay tickling coughs, &c.

Lozenges, Lavender. *Syn.* TROCHISCI LAVANDULÆ, L. From ¾ fl. dr. of Mitcham oil of lavender to each lb. of sugar, and tinged red with liquid lake or carmine; or violet, with litmus or indigo. *Used* chiefly to scent the breath. Those of the shops are generally deficient in odour.

Lozenges, Lem'on. *Syn.* TROCHISCI LIMONIS, T. LIMONUM, L. *Prep.* 1. From 1½ fl. dr. of oil of lemon to each 1 lb. of double refined white sugar.

2. (Acidulated.) See CITRIC and TARTARIC ACID LOZENGES.

Obs. Lemon lozenges and drops are agreeable sweetmeats, and those that are acidulated are often very useful to promote expectoration in coughs, &c. The last are also made into drops as well as lozenges, when they form the 'ACIDULATED LEMON DROPS' of the shops. Those that are made of citric acid are by far the most wholesome. Both lemon lozenges and drops are generally coloured with infusion of saffron or turmeric.

Lozenges, Lettuce. *Syn.* TROCHISCI LACTUCÆ, L. *Prep.* From extract of lettuce, extract of liquorice, gum, and sugar, equal parts. Anodyne and demulcent; in obstinate cough without expectoration. See LACTUCARIUM LOZENGES.

Lozenges, Li'chen. See ICELAND MOSS LOZENGES.

Lozenges, Liq'uorice. *Syn.* BLACK LOZENGES; TROCHISCI GLYCYRRHIZÆ, T. G. GLABRÆ, T BECHICI NIGRI, L. *Prep.* (1. Ph. E.) Extract of liquorice and gum acacia, of each, 6 oz.; white sugar, 12 oz.; dissolve in water, q. s.; evaporate to a paste, and form into lozenges, Pectoral and demulcent. *Useful* to allay tickling coughs and remove hoarseness.

2. (With OPIUM.) See OPIUM LOZENGES.

Lozenges, Magne'sia. *Syn.* HEARTBURN LOZENGES; TROCHISCI MAGNESIÆ (Ph. E.), L. *Prep.* 1. (Ph. E.) Carbonate of magnesia, 6 oz.; powdered white sugar, 3 oz.; oil of nutmeg, 20 drops; mucilage of tragacanth, q. s. to mix.

2. (Ph. U. S.) Calcined magnesia, 4 oz.; sugar, 12 oz.; nutmeg, 1 dr.; mucilage of tragacanth, q. s.; for 10-gr. lozenges.

3. (Wholesale.) Calcined magnesia, 3 oz.; powdered gum tragacanth, 1 oz.; double refined lump sugar, ¾ lb.; rose or orange-flower water, q. s. to make a lozenge mass.

Obs. Magnesia lozenges are very useful in heartburn, acidity, and indigestion. The confectioners generally omit the nutmeg, and make their mucilage with either rose or orange-flower water, or else add the dry gum to the mass, and then mix up the powders with one or other of these liquids. It is also an improvement to use calcined magnesia, which is about twice as strong as the carbonate, and consequently less need be employed.

Lozenges, Manna. *Syn.* TROCHISCI MANNÆ, L. *Prep.* (Van Mons.) Powdered tragacanth, 1 dr.; white sugar, 12 oz.; manna, 3 oz.; orange-flower water, q. s. to mix. Demulcent, and in large numbers slightly laxative.

Lozenges, Marsh-Mallow. *Syn.* TROCHISCI ALTHÆÆ, L.; TABLETTES DE GUIMAUVE, Fr. *Prep.* (P. Cod.) Marsh-mallow root (decorticated and finely powdered), 2 oz.; sugar, 14 oz.; mucilage of tragacanth (made with orange-flower water), q. s. Demulcent and expectorant. *Useful* to allay the irritation in cough, &c. The preparations of marsh-mallow have always been highly esteemed as pectorals by the vulgar.

Lozenges, Min'ium. *Syn.* TROCHISCI MINII (Ph. E. 1744), L. *Prep.* From red lead, 1 dr.; corrosive sublimate, 2 drs.; crum of bread, 1 oz.; rose water, q. s.; to be made up into oat-like grains. For external use only.

Lozenges, Morphia. *Syn.* TROCHISCI MORPHIÆ (B. P., Ph. E.), T. M. HYDROCHLORATIS, L. *Prep.* 1. (Ph. E.) Hydrochlorate of morphia, 20 grs.; tincture of tolu, ½ fl. oz.; powdered white sugar, 25 oz.; dissolve the hydrochlorate in a little warm water, mix it with the tincture and the sugar, make a mass with mucilage of gum tragacanth, q. s., and divide it into 15-gr. lozenges. Each lozenge contains about 1/40 gr. of hydrochlorate of morphia. *Used* as opium lozenges, but are pleasanter. The morphia lozenges of the shops generally contain 1/24 gr. of hydrochlorate of morphia. (Pereira.)

2. (With IPECACUANHA; TROCHISCI MORPHIÆ ET IPECACUANHÆ—Ph. E.) As the last, adding of ipecacuanha, 1 dr. Each lozenge contains about 1/40 gr. of hydrochlorate of morphia, and 1/13 gr. of ipecacuanha. Anodyne and expectorant; in tickling coughs, &c., and to allay pain.

3. Hydrochlorate of morphia, 20 grs.; tincture of tolu, ½ oz.; refined sugar, in powder, 24 oz.; gum arabic, in powder, 1 oz.; mucilage, 2 oz., or a sufficiency; boiling distilled water, ½ oz. Divide the mass into 720 lozenges. Each lozenge contains 1/36 gr. of hydrochlorate of morphia.—*Dose.* 1 or 2 occasionally, for cough.

Lozenges, Morphia and Ipecacuanha. *Syn.* TROCHISCI MORPHIÆ ET IPECACUANHÆ (B. P.) Hydrochlorate of morphia, 20 grs.; ipecacuanha, in fine powder, 60 grs.; tincture of tolu, ½ oz.; refined sugar, in powder, 24 oz.; gum arabic, in powder, 1 oz.; mucilage, 2 ozs., or a sufficiency; distilled water, $\frac{1}{2}$ oz.; divide the mass into 720 lozenges. Each lozenge contains $\frac{1}{36}$ grs. of hydrochlorate of morphia and $\frac{1}{12}$ gr. of ipecacuanha.—*Dose.* 1 or 2 occasionally, for cough.

Lozenges, Ni′tre. *Syn.* TROCHISCI NITRICI, L. *Prep.* 1. (Ph. E. 1783.) Nitre, 3 oz.; white sugar, 9 oz.; mucilage] of tragacanth, q. s. to mix. Diuretic; but chiefly sucked, without swallowing, to remove incipient sore throat.

2. (Camphorated; TROCHISCI NITRI CAMPHORATI, L.—Chaussier. Each lozenge contains $\frac{1}{8}$ gr. of opium, $\frac{1}{2}$ gr. of camphor, and 1 gr. of nitre. In hoarseness, sore throat, &c.

Lozenges, Nut′meg. *Syn.* TROCHISCI MYRISTICÆ, L. From oil of nutmeg, 1 fl. dr., to each lb. of sugar, and coloured with infusion of saffron. Carminative and stomachic; in colic, &c.

Lozenges, O′pium. *Syn.* ANODYNE LOZENGES; TROCHISCI OPII (Ph. E.), T. GLYCYRRHIZÆ CUM OPIO, L. *Prep.* 1. (B. P., Ph. E.) Opium (strained), 2 drs.; tincture of tolu, $\frac{1}{2}$ oz.; triturate together, add of powdered sugar, 6 oz.; extract of liquorice (soft) and powdered gum acacia, of each, 5 oz.; mix, and divide into 10-gr. lozenges. Each lozenge contains $\frac{1}{8}$ to $\frac{1}{7}$ gr. of opium. *Used* to allay tickling cough and irritation of the fauces, and as an anodyne and hypnotic.

2. (Ph. U. S.) Opium (in fine powder), 2 drs.; extract of liquorice, gum arabic, and sugar, of each, 5 oz.; oil of aniseed, $\frac{1}{2}$ fl. dr.; water, q. s.; divide into 6-gr. lozenges. Each lozenge contains $\frac{1}{16}$ gr. of opium. As the last.

3. Extract of opium, 72 grs.; tincture of tolu, $\frac{1}{2}$ oz.; refined sugar (in powder), 2 oz.; extract of liquorice, 6 oz.; distilled water, a sufficiency. Divide the mass into 720 lozenges. Each lozenge contains $\frac{1}{10}$ gr. of extract of opium.—*Dose.* 1 to 2 lozenges.

Lozenges, Or′ange. *Syn.* TROCHISCI AURANTII, L. From oil of orange, $1\frac{1}{2}$ fl. dr. to each lb. of sugar, and infusion of saffron for colouring. By adding nitric or tartaric acid, 3 drs., 'ACIDULATED ORANGE LOZENGES' will be formed.

Lozenges, Orange-flow′er. *Syn.* TROCHISCI AURANTII FLORUM, L. *Prep.* (P. Cod.) Powdered sugar, 1 lb.; neroli, 1 dr.; orange-flower water, q. s.; make it into drops (pastilli); or, omit the water, and make it into lozenges with mucilage of tragacanth made with orange-flower water. Delightfully fragrant.

Lozenges, Or′ris-root. *Syn.* TROCHISCI IRIDIS, L. *Prep.* From orris-root (in very fine powder), 1 oz.; sugar, 1 lb.; mucilage of tragacanth, q. s. to mix. *Used* to perfume the breath.

Lozenges, Ox′alate of Potassa. *Syn.* TROCHISCI POTASSÆ OXALATIS, T. P. SUPER-OXALATIS, L. As ACIDULATED LOZENGES, but using quadraoxalate of potassa (salt of sorrel) instead of tartaric acid. (See *below.*)

Lozenges, Oxal′ic Acid. *Syn.* TROCHISCI ACIDI OXALICI, L. As ACIDULATED LOZENGES, but using oxalic acid instead of tartaric acid. The last two are refrigerant, but their use is objectionable, especially for patients who labour under the oxalic diathesis. In large quantities they are poisonous.

Lozenges, Paregor′ic. *Syn.* TROCHISCI PAREGORICI, L. Medicated with 2 fl. oz. of paregoric, and 2 drs. of tartaric acid, to each lb. of sugar, and tinged of a pink colour with lake or cochineal. As a pectoral in catarrhs, &c.

Lozenges, Paullin′ia. *Syn.* TROCHISCI PAULLINIÆ, T. GUARANÆ, L. *Prep.* (Dr. Gavrelle.) Each lozenge contains nearly $\frac{1}{2}$ gr. of extract of garana or paullinia, and is flavoured with vanilla. 12 to 20 daily, as an alternative and tonic; in chlorosis, diarrhœa, &c.

Lozenges, Pec′toral. *Syn.* TROCHISCI PECTORALES, T. BECHICI, L. *Prep.* 1. (Dr. Grunn.) Powdered squills, 4 parts; extract of lettuce, 8 parts; ipecacuanha, 18 parts; manna, 125 parts; sugar, 250 parts; mucilage of tragacanth, q. s. to mix.

2. (Magendie.) See EMETINE LOZENGES.

3. (BLACK; T. BECHICI NIGRI.) See LIQUORICE LOZENGES.

4. (WHITE; T. BECHICI ALBI.) Orris root, 4 drs.; liquorice powder, 6 drs.; starch, $1\frac{1}{2}$ oz.; sugar, 18 oz.; mucilage of tragacanth, q. s. to make a lozenge-mass.

5. (YELLOW; T. BECHICI FLAVI.) Powdered orris root, 6 drs.; starch, 4 drs.; liquorice powder, 3 drs.; saffron, 2 drs.; sugar, 8 oz.; mucilage of tragacanth, q. s. to mix.

Obs. All the above are used as demulcents in coughs, colds, &c. Nos. 1 and 2 are anodyne as well as demulcent. For other formulæ, see COUGH LOZENGES, LIQUORICE L., OPIUM L., &c.

Lozenges, Pel′litory. *Syn.* TROCHISCI PYRETHRI, L. *Prep.* From pellitory, mastic, and tragacanth, of each, in fine powder, equal parts; orange-flower water, q. s. to mix. In toothache.

Lozenges, Pep′permint. *Syn.* TROCHISCI MENTHÆ PIPERITÆ, L. *Prep.* 1. (P. Cod.) Oil of peppermint, 1 dr.; powdered sugar, 16 oz.; mucilage of tragacanth, q. s.

2. (Ph. U. S.) Oil of peppermint, 1 fl. dr.; sugar, 12 oz.; mucilage of tragacanth, q. s.

3. (Wholesale.) 1 fl. dr. of the finest Mitcham oil of peppermint to each lb. of the finest double refined white sugar, with mucilage of either gum arabic or tragacanth to mix.

Obs. The best peppermint lozenges are made of the very finest double refined sugar, and of English oil of peppermint only; carefully mixed up with very clean mucilage. The commoner qualities are made by employing inferior lump sugar and foreign oil of peppermint, or, what is better, English oil of peppermint, but in a less proportion than for the better sorts. The addition of starch, in quantity varying from $\frac{1}{6}$ to $\frac{2}{3}$ of the whole mass is also commonly made to them; and in the cheapest varieties even plaster of Paris or chalk is occasionally introduced by unprincipled makers. The addition of a very small quantity of blue smalts, reduced to an impalpable powder, is commonly made to the sugar, to increase its whiteness. 'TRANSPARENT' or 'SEMI-TRANSPARENT PEPPERMENT LOZENGES' are made from the same materials as the opaque ones; but the sugar is not reduced to quite so fine a powder, and the cake is rolled thinner before cutting it. A little oil of almonds or of olives is also occasionally mixed with the ingredients, to promote the transparency; but it tends to render the lozenges less white.

Peppermint lozenges and drops are useful in flatulency, nausea, and griping; and judging from the enormous and constantly increasing demand for them, they are more highly esteemed by the public than all other lozenges and confections.

Lozenges, Pontefract. These are made of the purest refined juice or extract of liquorice, and have long been esteemed as a demulcent.

Lozenges, Pop'py. *Syn.* TROCHISCI PAPAVERIS, L. *Prep.* From extract of poppies, 3 oz.; sugar, 15 oz.; powdered gum tragacanth, 2 oz.; rose water, q. s. to mix. *Used* in coughs as an anodyne and demulcent, in lieu of opium lozenges.

Lozenges, Pulmon'ic. See COUGH LOZENGES, PECTORAL L., WAFERS, &c.

Lozenges, Quinine'. *Syn.* TROCHISCI QUINÆ SULPHATIS, L. *Prep.* (Soubeiran.) Each lozenge contains about ⅒ gr. of sulphate (disulphate) of quinine. Tonic, and stomachic, in dyspepsia, &c.; but to render them useful, the quantity of the alkaloid should be doubled.

Lozenges, Reduced Iron. *Syn.* TROCHISCI FERRI REDACTI. (B. P.) Reduced iron, 720 grs.; refined sugar, in powder, 25 oz.; gum arabic, in powder, 1 oz.; mucilage, 2 oz.; distilled water, 1 oz., or a sufficiency. Mix the iron, sugar, and gum, and add the mucilage and water to form a proper mass. Divide into 720 lozenges, and dry them in a hot-air chamber with a moderate heat. Each lozenge contains 1 gr. of reduced iron.—*Dose.* 1 to 6 lozenges.

Lozenges, Rhu'barb. *Syn.* DIGESTIVE LOZENGES; TROCHISCI RHEI, L. *Prep.* (P. Cod.) Powdered rhubarb, 1 oz.; sugar, 11 oz.; mucilage of tragacanth, q. s.; divide into 12-gr. lozenges. Stomachic and laxative. Sucked before dinner, they excite the appetite, and after it promote digestion. They are frequently aromatized with a little cinnamon or vanilla. See Candy (Digestive).

Lozenges, Rose. *Syn.* TROCHISCI ROSÆ, L. *Prep.* 1. (ACIDULATED; T. R. ACIDÆ.) From otto, 5 to 10 drops; citric or tartaric acid, 3 drs.; sugar, 1 lb.; mucilage, q. s.

2. (Ph. E. 1746.) Red-rose leaves (powdered), 1 oz.; sugar, 12 oz.; mucilage, q. s.

3. (PÂTE DE ROSE LOZENGES.) As No. 1, ig one half of the acid.

4. (RED; T. R. RUBRI.) As No. 1; but coloured with liquid lake, or infusion of cochineal.

Obs. Some makers add of starch, 4 oz., substitute oil of rhodium for otto of roses, and use mucilage made with rose water; but the quality of course suffers. They are chiefly used to perfume the breath.

Lozenges, Saf'fron. *Syn.* TROCHISCI CROCI, L. *Prep.* From hay saffron (in fine powder), 1 oz.; white sugar, 1 lb.; mucilage of gum tragacanth, q. s. to mix. Anodyne, pectoral, and emmenagogue; but chiefly used to raise the spirits in hypochondriasis.

Lozenges, San'tonine. *Syn.* TASTELESS WORM LOZENGES; TROCHISCI SANTONINI, L. Each lozenge contains ½ gr. (nearly) of santonine. 5 to 10 daily, as a vermifuge.

Lozenges, So'da. *Syn.* TROCHISCI SODÆ BICARBONATIS (Ph. E.), L. *Prep.* 1. (Ph. E.) Bicarbonate of soda, 1 oz.; powdered gum arabic, ½ oz.; sugar, 3 oz.; mucilage, q. s.

2. (Wholesale.) From bicarbonate of soda and powdered gum tragacanth, of each, 2 oz.; double refined lump sugar, ¾ lb.; rose water, q. s. to mix. In acidity, heartburn, &c. See VICHY LOZENGES.

3. (With GINGER; TROCHISCI SODÆ ET ZINGIBERIS, L. To the last, add of ginger (in very fine powder), 1½ oz.; powdered gum, ½ oz.

Lozenges, Squills. *Syn.* TROCHISCI SCILLÆ, L. 1. Each lozenge contains ⅛ gr. of powdered squills and 2 grs. of extract of liquorice.

2. (With IPECACUANHA; TROCHISCI SCILLÆ ET IPECACUANHÆ, L. As the last, adding for each lozenge ¼ gr. of powdered ipecacuhana. Both the above are useful cough lozenges.

Lozenges, Starch. *Syn.* TROCHISCI AMYLI, T. BECHICI ALBI, L. See PECTORAL LOZENGES.

Lozenges, Steel. *Syn.* TROCHISCI FERRI, T. CHALYBEATI, L. *Prep.* (P. Cod.) Levigated iron filings, 1 oz.; sugar, 10 oz.; cinnamon, 2 drs.; mucilage of tragacanth, q. s.; mix, and divide into 480 lozenges. Tonic. See IRON LOZENGES.

Lozenges, Sul'phur. *Syn.* TROCHISCI SULPHURIS, L. *Prep.* (P. Cod.) From sulphur (pure precipitate), 2 oz.; sugar, 16 oz.; mucilage of tragacanth (made with rose water), q. s. to mix. Useful in piles and some skin diseases.

Lozenges, Tannic Acid. *Syn.* TROCHISCI ACIDI TANNICI (B. P.) Tannic acid, 360 grs.; tincture of tolu, ½ oz.; refined sugar, 25 oz.; gum acacia, 1 oz.; mucilage, 2 oz.; distiiled water, 1 oz. Dissolve the tannic acid in the water; add first the tincture of tolu previously mixed with the mucilage, then the gum and the sugar, also previously well mixed. Form the whole into a proper mass, divide into 720 lozenges, and dry them in a hot-air chamber with a moderate heat. Each lozenge contains ½ gr. of tannic acid.—*Dose.* 1 to 6 lozenges.

Lozenges, Tarta'ric Acid. See Acidulated Lozenges.

Lozenges, Tolu'. *Syn.* Balsamic lozenges; Trochisci tolutani, T. balsamicæ, L. *Prep.* 1. (P. Cod.) Balsam of tolu and rectified spirit, of each, 1 oz.; dissolve, add of water, 2 fl. oz., heat the mixture in a water bath, and filter; make a mucilage with the filtered liquid, and gum tragacanth (in powder), 80 gr.; add of sugar, 16 oz.; make a mass, and cut it into lozenges.

2. (Wholesale.) As the last, but using only one half the weight of balsam of tolu. Pectoral and balsamic.

Lozenges, Tronchin's. *Syn.* Tablettes de Tronchin, Fr. See Cough Lozenges.

Lozenges, Vanil'la. *Syn.* Troschisci vanillæ, L. *Prep.* 1. Essence of vanilla, 3 fl. dr., to each lb. of sugar.

2. (Guibourt.) From vanilla triturated to a fine powder with 7 times its weight of sugar. Antispasmodic, nervine, and stomachic. *Used* to sweeten the breath, to flavour chocolate, &c.

Lozenges, Vichy. *Syn.* D'Arcet's lozenges; Trochisci sodæ, L.; Pastilles de Vichy, Fr. *Prep.* 1. (P. Cod.) Bicarbonate of soda, 1 oz.; powdered sugar, 19 oz.; mucilage of gum tragacanth, q. s.; mix, and divide into 20-gr. lozenges.

2. (D'Arcet.) As the last, adding a little oil of peppermint to give a slight flavour. Antacid or absorbent; in heartburn, &c.

Lozenges, Vi'olet. *Syn.* Trochisci violæ, T. violarum, L. *Prep.* Orris lozenges coloured with the juice of violets.

Lozenges, Wistar's Cough. *Prep.* Gum arabic, extract of liquorice, and sugar, of each, 2½ oz.; powdered opium, 1 dr.; oil of aniseed, 40 drops; for 60 lozenges. One, three or four times a day.

Lozenges, Worm. *Syn.* Trochisci anthelmintici, Morsuli contra vermes, L. Most of the advertised nostrums under this name have a basis of calomel (about 1 gr. per lozenge), and require to be followed by a purge a few hours afterwards.

1. (Ph. Austr. 1836.) Ethereal extract of wormseed, 1 dr.; jalap, starch, and sugar, of each, 2 drs.; mucilage of gum tragacanth, q. s.; divide into 60 lozenges.

2. (Ph. Dan. 1840.) Wormseed, 1 oz.; ethiops mineral and jalape, of each, 3 drs.; cinnamon, 2 drs.; sugar, 7 oz.; rose water, q. s. See Calomel, Ching's, Santonine Lozenges, &c. (*above*).

Lozenges, Zinc. *Syn.* Trochisci zinci, T. z. sulphatis, L. *Prep.* (Dr. Copland.) Each lozenge contains ¼ gr. of sulphate of zinc. Antispasmodic, expectorant, and tonic; and in quantity emetic.

LU'CIFERS. See Matches.

LUMBA'GO. Rheumatism of the loins. It is distinguished from nephritis, or inflammation of the kidneys, by the pain being aggravated on stooping. The treatment consists of strong stimulant embrocations or liniments, or of blisters over the part affected, with active aperients, warmth, and diaphoretics (as Dover's powder) at bedtime. The hot or vapour bath often gives almost immediate relief. See Rheumatism.

LU'MINOUS PHIAL. See Phosphorus.

LU'NA CORNEA. [L.] *Syn.* Horn silver. Fused chloride of silver.

LU'NAR CAUSTIC. Fused nitrate of silver. See Caustic and Silver.

LUNGS. In anatomy, the organ of respiration occupying the thorax or chest. See Respiration.

LU'PULIN. *Syn.* Lupulina, Lupuline. Under this name two products are known, namely—1. (Lupulinic grains, L. glands.) The yellow powder obtained from the dried strobiles or catkins of the hops, by gently rubbing and sifting them.—*Dose.* 5 to 10 grs.; as an anodyne, tonic, &c.

2. The aromatic bitter principle of hops.

Prep. The aqueous extract of the yellow powder or lupulinic grains of the strobiles, along with a little lime, are treated with rectified spirit; the filtered tincture is evaporated to dryness, redissolved in water, and the solution is again filtered, and evaporated to dryness; the residuum is, lastly, washed with ether, and allowed to dry.

Prop., &c. The latter product is a yellowish-white, bitter, uncrystallisable substance, soluble in 20 parts of water, very soluble in alcohol, and slightly so in ether. The yellow powder above alluded to (No. 1) is improperly called lupulin; a name which appears more appropriate to the pure bitter principle than to the lupulinic grains.

Adult. The lupulin sold to brewers is largely adulterated with quassia. In some samples, lately examined, the quassia amounted to 70 per cent.

LU'PUS. In pathology, a disease affecting the skin, remarkable for eating away the parts which it attacks with extreme rapidity. It is generally confined to the face, and commences with small, spreading ulcerations, which become more or less concealed beneath bran-like scabs, and end in ragged ulcers, which gradually destroy the skin and muscular tissue to a considerable depth.

LUS'TRE. See Plumbago.

LUTE. *Syn.* Luting; Lutum, Cæmentum, L. A composition employed to secure the joints of chemical vessels) or as a covering to protect them from the violence of the fire.

Prep. 1. Linseed meal, either alone or mixed with an equal weight of whiting, and made into a stiff paste with water. It soon becomes very hard and tough.

2. Ground almond cake, from which the oil has been pressed, mixed up as the last. Both the above are much used for stills, retorts, and other vessels that are not exposed to a heat higher than about 320° Fahr. They are capable of resisting the action of the fumes of

volatile oils, spirits, weak acids, &c., for some time.

3. Fresh-slaked lime made into a paste with strained bullock's blood or size. As the last.

4. Plaster of Paris made into a paste with water, and at once applied. It bears a nearly red heat, but becomes rather porous and friable.

5. Powdered clay or whiting made into putty with water and boiled linseed oil. This is commonly known as 'fat lute.'

6. A mixture of powdered clay and ground bricks, made up with water or a solution of borax. For joining crucibles, &c., which are to be exposed to a strong heat.

7. Pipe-clay and horse-dung, made into a paste with water. As a coating for glass vessels, to preserve them from injury from exposure to the fire. This composition is used by the pipe-makers, and will stand unharmed the extremest heat of their kiln for 24 hours. It is applied by spreading it on paper.

8. As the last, but employing shredded tow or plumbago for horse-dung.

Obs. For the joints of small vessels, as tubes, &c., especially those of glass or earthenware, pieces of vulcanized Indian tubing, slipped over and tied above and below the joint, are very convenient substitutes for lutes, and have the advantage of lasting for a long time, and bearing uninjured the heat at which oil of vitriol boils. Flat rings or "washers" of vulcanised rubber are also excellent for still heads, &c., whenever the parts can be pinched together by screws or clamps.

LYCOPO'DIUM. The fine powder known in commerce under this name consists of the minute spores of the common club moss, or *Lycopodium clavatum.* It is exceedingly combustible; thrown suddenly from a powder-puff or bellows across the flame of a candle, it produces the imitation flashes of lightning of our theatres. The powder is also employed as a 'dusting powder' in excoriations, and to roll up boluses and pills.

MACARO'NI. This only differs from VERMICELLI in the size of the pipes, which are about as large as a goose-quill. When properly dressed, it is very wholesome and nutritious. A pleasant dish may be made by boiling macaroni in water until soft, either with or without a little salt, draining off the water, and then stewing it with a little butter, cream, or milk, and grated cheese, adding spice to palate. It may be made into a 'form' and browned before the fire.

MAC'AROONS (English). *Prep.* Take of sweet almonds, 1 lb.; blanch and beat them to a paste, add of lump sugar 1¼ lb.; whites of 6 eggs; the grated yellow peel of 2 lemons; mix well, make it into 'forms,' cover with wafer paper, and bake in a moderate oven.

MACE. *Syn.* MACIS, L. The tough membranous, lacerated, covering (ariliode) of the NUTMEG. It has a flavour and odour more agreeable than that of nutmeg, which in its general properties it resembles. It is *used* as a flavouring by cooks, confectioners, and liquoristes; and in medicine as a carminative. See OIL, &c.

MACERA'TION. *Syn.* MACERATIO, L. The steeping of a substance in cold water, for the purpose of extracting the portion soluble in that menstruum. The word is also frequently applied to the infusion of organic substances in alcohol or ether, or in water, either alkalised or acidulated.

MACK'EREL. The *Scomber scombrus* (Linn.), a well-known spiny-finned sea-fish, much esteemed at certain seasons for the table. Though nutritious, it is very apt to disagree with delicate stomachs, and occasionally induces symptoms resembling those of poisoning.

MAD'DER. *Syn.* RUBIA, RUBIÆ RADIX, L. The root of *Rubia tinctorum* (Linn.), or dyer's madder. The best madder has the size of a common goose-quill, a reddish appearance, and a strong odour. As soon as the roots are taken from the ground they are picked and dried; and before use they are ground in a mill. Levant, Turkey, and Smyrna madder, is imported whole; French, Dutch, and Zealand madder, ground. The finest quality of ground madder is called 'crop' or 'grappe;' 'ombro' and 'gamene' are inferior sorts, and 'mull' the worst.

Madder contains several distinct principles, as—madder red, or alizarin;—madder purple, or purpurin;—madder orange, or rubiacin;—madder yellow, or xanthin, &c. The first of these (noticed *below*) is by far the most important.

Pur. Madder is frequently adulterated with logwood, Brazil wood, and other dye-stuffs of inferior value; and also, not unfrequently, with brick-dust, red ochre clay, sand, mahogany saw-dust, bran, &c. These admixtures may be detected as follows:

1. When dried at 212° Fahr., and then incinerated, not more than 10% to 12% of ash should be left.

2. It should not lose more than 50% to 56% by exhaustion with cold water.

3. When assayed for alizarin (see *below*), the quantity of this substance obtained should be equal to that from a sample of the same kind of madder which is known to be pure, and which has been treated in precisely the same manner. The operation may be conducted as follows:—500 grs. of the sample are weighed, and, after being dried by the heat of boiling water or steam, are gradually added to an equal weight of concentrated sulphuric acid, contained in a glass vessel, and stirred with a glass rod; after a few hours the charred mass is washed with cold water, collected on a filter, and dried by the heat of boiling water; the carbonised mass ('garacine') is next powdered, and treated with successive portions of rectified spirit, to which a little ether has been added, at first in the cold, and afterwards

with heat, until the liquid is no longer coloured by it, when the mixed tincture is filtered, and evaporated (distilled) to dryness; the weight of the residuum, divided by 5, gives the per-centage of red colouring matter present. Or,—The dried carbonized matter is exhausted by boiling it in a solution of 1 part of alum in 5 or 6 parts of water, and the decoction, after being filtered whilst in the boiling state, is treated with sulphuric acid as long as a precipitate falls, which is washed, dried, and weighed as before.

Uses, &c. Madder has been given in jaundice and rickets, and as an emmenagogue.—*Dose.* ½ dr. to 2 drs., twice or thrice a day. It is principally employed as a dye-stuff. See Red Dyes, Ivory, Purpurin, &c., also *below*.

MADDER RED. *Syn.* Alizarin. $C_{14}H_8O_4$. 2 Aq. The red colouring principle of madder, first obtained in a separate form by Robiquet.

Prep. 1. The aqueous decoction of madder is treated with dilute sulphuric acid as long as a precipitate falls, which, after being washed, is boiled in a solution of chloride of aluminum as long as it gives out colour; the liquid is then filtered, precipitated with hydrochloric acid, and the precipitate washed and dried. It may be purified from a little adhering purpurin, by dissolving it in alcohol, again throwing it down with hydrate of aluminum, boiling the precipitate with a strong solution of soda, and separating the alizarin from its combination with alumina by means of hydrochloric acid; it is lastly crystallised from alcohol.

2. (Meillet.) Alum, 3 parts, is dissolved in water at 140° Fahr., 30 parts, and madder, 13 parts, added to the solution; the whole is then gently boiled for 30 or 40 minutes, after which it is thrown upon a filter, and submitted to strong pressure; this treatment is repeated with fresh solutions a second and a third time; the mixed filtrates are then decanted, and when nearly cold, oil of vitriol, 1 part, diluted with twice its bulk of water, is added, care being taken to stir the liquid all the time; the supernatant fluid is next decanted, and the residuum well washed, and, lastly, dried in the air. If required quite pure, it is dissolved, whilst still moist, in a solution of 1½ times its weight of carbonate of potassa in 15 parts of water, and, after reprecipitation with sulphuric acid, is washed and dried as before.

3. (Robiquet & Colin.) Powdered madder is exhausted with water of a temperature not exceeding 68° Fahr., and, after being dried, 1 part of it is boiled for 15 or 20 minutes in a solution of alum, 8 parts, in water, 40 parts; the liquid is filtered whilst boiling, the marc well washed with a fresh solution of alum, the mixed liquids precipitated with sulphuric acid, and the precipitate washed and dried, as before.

Obs. Alizarin has recently been produced artificially by Graebe and Liebermann from anthracene ($C_{14}H_{10}$), a liquid hydrocarbon existing in coal-tar. For a description of the process see the 'Journal of the Chemical Society.'

4. Madder exhausted by 2 or 3 macerations in 5 or 6 times its weight of cold water, is submitted to strong pressure, to remove adhering water, and the marc, whilst still moist, is mixed with ½ its weight of oil of vitriol diluted with an equal quantity of water; the whole is kept at the temperature of 212° for an hour, and after being mixed with cold water is thrown on a linen strainer, well washed with cold water, and dried.

5. From powered madder and oil of vitriol, equal parts, without heat, as described under Madder.

6. (F. Steiner.) The 'used madder' of the dye-works is run into filters, and precipitated with sulphuric acid; the matter thus obtained is put into bags and rendered as dry as possible by hydraulic pressure; the pressed cake is next crumbled to pieces, placed in a leaden vessel, and treated with 1-5th of its weight of oil of vitriol, afterwards assisting the action of the acid by introducing steam to the mixture; the resulting dark brown carbonized mass is, lastly, well washed, dried, powdered, and mixed with about 5% of carbonate of soda, when it is ready for sale.

Obs. The last three formulæ produce the 'garance' or 'garancine' of commerce, now so extensively used in dyeing.

Prop., &c. Pure anhydrous alizarin crystallises in magnificent orange-red crystals, which may be fused and sublimed; it is freely soluble in alkaline solutions, which it colours purple or violet; and in oil of vitriol, giving a rich red colour; water throws it down from the last unchanged; it is also soluble in hot alcohol, a hot solution of alum, and, less freely, in hot water. Hydrated alizarin occurs in small scales resembling mosaic gold. When impure, it generally forms shining reddish-brown scales. Commercial 'garancine' is a deep brown or puce-coloured powder, and will probably, ere long, entirely supersede crude madder for dyeing. The properties of garancine as a dye-stuff are precisely similar to those of madder. A solution of alum added to a solution of alizarin, and precipitated by carbonate of potassa, furnishes a rose lake; which, after being washed with water and dried, possesses a most charming tint.

MAGILP′. *Syn.* Megellup. A mixture of pale linseed oil and mastic varnish, employed by artists as a 'vehicle' for their colours. The proportions vary according to the work. It is thinned with turpentine.

MAG′ISTERY. *Syn.* Magisterium, L. The old name of precipitates. The following are the principal substances to which this term has been applied:—Magistery of alum, hydrate of alumina; M. of bismuth, sub-nitrate of bismuth; M. of diaphoretic antimony, washed diaphoretic antimony; M. of

OPIUM (Ludolph's), crude morphia; M. OF LAPIS CALAMINARIS or M. OF ZINC, hydrated oxide of zinc.

MAGNESIA. See MAGNESIUM, OXIDE OF.

MAGNE'SIAN APE''RIENT (Effervescing). *Prep.* 1. Heavy carbonate of magnesia, 2 lbs.; tartaric acid and double refined lump sugar, of each 1½ lb.; bicarbonate of soda (dried without heat), 1 lb.; each separately dried and in very fine powder; essential oils of orange and lemon, of each, ½ fl. dr.; mix well in a warm, dry situation, pass the whole through a sieve, put it into warm, dry bottles, and keep them well corked.

2. As the last, but substituting calcined magnesia, 1 lb., for the heavy carbonate, and adding sugar, ¾ lb. The preceding furnish a very pleasant effervescing saline draught.

3. (MOXON'S.)—*a.* Take of sulphate of magnesia, 2 lbs.; dry it by a gradually increased heat, powder, add of tartaric acid (also dried and powdered), 1¼ lb.; calcined magnesia, ½ lb.; finely powdered white sugar, 3 lbs.; bicarbonate of soda (dried without heat), 1 lb.; essence of lemon, 1 dr.; mix, and proceed as before.

b. (Durande.) Carbonate of magnesia, 1 part; bicarbonate of soda, tartrate of soda and potassa (sel de Seignette), and tartaric acid, of each, 2 parts; mix as before.

c. (Pharm. Journ.) Sulphate of magnesia and bicarbonate of soda, of each, 1 lb.; tartaric acid, ½ lb.; mix as before. The last two are much less agreeable than the others.

4. Carbonate of magnesia, 2 parts; calcined magnesia, 4 parts; citric acid, 13 parts; lump sugar, 25 parts; essence of lemon, q. s. to flavour. Very agreeable. This is known as 'ROGÉ'S PURGATIF.'

Obs. The above are very useful and popular medicines in indigestion, heartburn, nausea, habitual costiveness, dyspepsia, &c.—*Dose.* ½ to 2 dessert-spoonfuls, thrown into tumbler 3 parts filled with cold water, rapidly stirred and drunk whilst effervescing, early in the morning fasting, or between breakfast and dinner.

MAGNESIAN LEMONADE'. See CITRATE OF MAGNESIA (*above*) and LEMONADE (Aperient).

MAGNE'SIUM. Mg. *Syn.* MAGNIUM, TALCIUM. The metallic radical of magnesia. The existence of this metal was demonstrated by Sir H. Davy, in 1808; but it was first obtained in sufficient quantity to examine its properties by Bussy, in 1830.

Prep. 5 or 6 pieces of sodium, about the size of peas, are introduced into a test-tube, and covered with small fragments of chloride of magnesium; the latter is then heated to near its point of fusion, when the flame of the lamp is applied to the sodium, so that its vapour may pass through the stratum of heated chloride; when the vivid incandescence that follows is over, and the whole has become cold, the mass is thrown into water, and the insoluble metallic portion collected and dried.

Commercial magnesium is prepared by evaporating solution of the chlorides of sodium and magnesium, in the proportion of 1 to 3, to dryness, mixing with one quarter of its weight of fluor spar and a like amount of sodium, and heating to bright redness in an iron crucible of proper construction.

On a larger scale it is prepared by heating to redness a mixture of chloride of magnesium, 9 parts; fused chloride of sodium, 1½ parts; fluoride of calcium, 1½ parts; and sodium in slices, 1½ parts.

Prop., &c. In colour and lustre it resembles silver, but in chemical properties is more like zinc; its sp. gr. is only 1·743; it is malleable; fusible at a red heat, and can be distilled like zinc; unaffected by dry air and by cold water; burns with brilliancy when heated to dull redness in air or oxygen gas, yielding oxide of magnesium; inflames spontaneously in chlorine, yielding chloride of magnesium; it dissolves in the acids with the evolution of hydrogen gas, and pure salts of magnesium result.

It has been used somewhat extensively as an illuminating agent for photographing at night, and also for the purpose of affording a brilliant light for microscopic and magic lantern effects.

Magnesium, Carbonate of (Light). *Syn.* LIGHT CARBONATE OF MAGNESIA; CARBONATE OF MAGNESIA; MAGNESIA; MAGNESIÆ CARBONAS LEVIS (B. P.) *Prep.* 1. (Ph. L.) Sulphate of magnesium, 4 lbs., and carbonate of sodium, 4 lbs. 9 oz.; boiling distilled water, 4 galls.; dissolve the salts separately in one half the water, filter, mix the solutions, and boil for 2 hours, constantly stirring with a spatula, distilled water being frequently added to compensate for that lost by evaporation; lastly, the solution being poured off, wash the precipitated powder with boiling distilled water, and dry it. The formulæ of the Ph. E. & D. are essentially the same, except that the ebullition is limited to from 10 to 20 minutes.

2. (B. P.) Similar to the foregoing except that precipitation takes place in the cold. The formula of this compound is $(Mg.\,CO_3)_3.\,Mg(HO)_2.4H_2O$.

3. (HENRY'S.) Ordinary carbonate of magnesia, the washing of which has been finished with a little rose water.

4. Add a solution of carbonate of potassium or sodium to the bittern or residuary liquor of the sea-salt works, and well wash and dry the precipitate as before. This is known in commerce as 'Scotch magnesia."

Obs. The carbonate of magnesia of commerce is usually made up into cakes or dice, while drying; or it is permitted to drain and dry in masses, which are then cut into squares with a thin knife. It is powdered by simply rubbing it through a wire sieve. The presence of iron in the solution of the sulphate of magnesium, when the crude salt is employed, and which is destructive to the beauty of the preparation may be got rid of by the addition of lime water until the liquor acquires a slight alkaline reaction and subsequent decantation after repose.

Magnesium, Carbonate of (Heavy). *Syn.* HEAVY CARBONATE OF MAGNESIA; MAGNESIÆ CARBONAS (B. P.). *Prep.* 1. Apothecaries' Hall. A saturated solution of sulphate of magnesium, 1 part, is diluted with water, 3 parts, and the mixture heated to the boiling-point; a cold saturated solution of carbonate of sodium, 1 part (all by measure), is then added, and the whole is boiled with constant agitation until effervescence ceases; boiling water is next freely poured in, and after assiduous stirring for a few minutes, and repose, the clear liquid is decanted, and the precipitate thrown on a linen cloth and thoroughly washed with hot water; it is, lastly, drained, and dried in an iron pot.

2. (Ph. D.) Dissolve sulphate of magnesium, 10 oz., in boiling distilled water, ½ pint; and carbonate of sodium (cryst.), 12 oz., in boiling distilled water, 1 pint; mix the two solutions, and evaporate the whole to dryness by the heat of a sand bath; then add of boiling water, 1 quart, digest with agitation for half an hour, and wash the insoluble residuum as before; lastly, drain it, and dry it at the temperature of boiling water.

3. (B. P.) White granular powder precipitated from a boiling solution of sulphate of magnesium by a solution of carbonate of sodium, the whole evaporated to dryness, and the dry residue digested in water, collected on a filter, and washed.

Prop. The ordinary or light carbonate of magnesia is a white, inodorous, tasteless powder, possessing similar properties to calcined magnesia, except effervescing with acids, and having less saturating power. An ounce measure is filled by 45 to 48 grs. of the powder lightly placed in it. The heavy carbonate is sometimes fully thrice as dense (see *below*), but in other respects is similar.

Dose. As an antacid, ½ to a whole teaspoonful, 3 or 4 times daily; as a laxative, ½ dr. to 2 drs. It is commonly taken in milk. It is apt to produce flatulence, but in other respects is preferable to calcined magnesia.

General remarks. Although commonly called 'carbonate of magnesia,' the above substance, whether in the light or heavy form, appears to be a compound of carbonate with hydrate, in proportions which are not perfectly constant. (For B. P. formula see preceding article.) On account of the excess of base in its composition, it was formerly regarded as a subsalt (subcarbonate of magnesia). A great deal has been written uselessly respecting the preparation of these carbonates, about which, however, there is neither mystery nor difficulty, as some writers would lead their readers to suppose. If the solutions are very dilute, the precipitate is exceedingly light and bulky; if otherwise, it is denser. By employing nearly saturated solutions, and then heating them and mixing them together whilst very hot, a very heavy precipitate is obtained, but it is apt to be gritty or crystalline. The same occurs when cold solutions are mixed, and no heat is employed. The lightest precipitate is obtained from cold, highly dilute solutions, and subsequent ebullition of the mixture.

Mr. Pattinson, a chemist of Gateshead, prepares a very beautiful and pure heavy carbonate from magnesian limestone. The latter is calcined at a dull red heat (not hotter) for some time, by which the carbonic anhydride is expelled from the carbonate of magnesium, but not from the carbonate of calcium, which hence continues insoluble. The calcined mass is next reduced to a milk with water in a suitable cistern, and the carbonic anhydride resulting from its own calcination forced into it under powerful pressure. The result is a saturated solution of carbonate of magnesium, the lime remaining unacted on so long as the magnesia is in excess. The solution by evaporation yields the heavy carbonate, whilst carbonic anhydride is expelled, and may be again used in the same manufacture. 154 to 160 grs. of the heavy carbonate are required to fill an ounce measure when lightly placed in it, by which it appears to be fully thrice as dense as the light carbonate. The bicarbonate of magnesium (magnesiæ bicarbonas, L.) exists only in solution. The so-called 'fluid magnesias' of Murray, Dinneford, Husband, &c., are solutions of this salt. The small prismatic crystals which are deposited when 'fluid magnesia' is exposed to the air for some time consist of hydrated neutral carbonate, and not bicarbonate, as is sometimes stated.

Magnesium, Chloride of. $MgCl_2$. *Syn.* MAGNESII CHLORIDUM, L. *Prep.* (Liebig,) By dissolving magnesia in hydrochloric acid, evaporating to dryness, adding an equal weight of chloride of ammonium, projecting the mixture into a red-hot platinum crucible, and continuing the heat till a state of tranquil fusion is attained. On cooling, it forms a transparent, colourless, and very deliquescent mass, which is anhydrous, and soluble in alcohol.

Obs. Without the addition of the chloride of ammonium, it is impossible to expel the last portion of the water, without at the same time driving off the chlorine, in which case nothing but magnesia is left. The fused mass should be poured out on a clean stone, and when solid, broken into pieces, and at once transferred to a warm, dry bottle. The P. Cod. orders the solution to be evaporated to the sp. gr. 1·384, and to be put, whilst still hot, into a wide-mouthed flask to crystallise.—*Dose.* 1 to 4 drs.; as a laxative.

Magnesium, Cit′rate of. $Mg_3(C_6H_5O_7)_2$. *Syn.* MAGNESIÆ CITRAS, L. *Prep.* There is some difficulty in obtaining this salt in an eligible form for medicinal purposes. When precipitated from a solution, it is insoluble. The following formulæ can be highly recommended.

1. (Parrish.) Dissolve crystallised citric acid, 100 gr., in water, 15 drops, and its own 'water of crystallization' by the aid of heat; then stir in calcined magnesia, 35 gr.; a pasty mass will result, which soon hardens, and may be powdered for use.

Obs. The chief practical difficulty in this process results from the great comparative bulk of the magnesia, and the very small quantity of the fused mass with which it is to be incorporated. A part of the magnesia is almost unavoidably left uncombined, and the salt is consequently not neutral. The uncombined earth should be dusted off the mass before powdering the latter. A high temperature must be avoided.

2. (Robiquet.) Citric acid, 35¼ parts, is powdered and dissolved in boiling water, 10⅝ parts; when the solution is cold, and before it crystallizes, it is poured in a wide earthen vessel, kept cold by surrounding it with water; then, by means of a sieve, carbonate of magnesium, 21⅛ parts, is distributed evenly and rapidly over the surface without stirring; when the reaction ceases, the mixture is beaten rapidly as long as it retains its pasty consistence. The salt should be dried at a temperature not exceeding 70° Fahr.

3. Effervescing; MAGNESIÆ CITRAS EFFERVESCENS, L.)—*a.* Citric acid (dried and powdered), 7 parts; heavy carbonate of magnesium, 5 parts; mix, and preserve in well-corked bottles.

b. (Ellis.) Mix powdered citric acid 2½ oz., with powdered sugar, 8 oz.; triturate to a fine powder, and drive off the water of crystallization by the heat of a water bath; add citrate of magnesium (prepared by fusion), 4 oz., and oil of lemons, 10 drops, and mix intimately; then add bicarbonate of sodium, 3 oz., and again triturate until the whole forms a fine powder, which must be preserved in stoppered bottles. From 1 to 3 table-spoonfuls, mixed in a tumbler of water, furnishes an effervescing draught in which the undissolved portion is so nicely suspended, that it can be taken without inconvenience.

c. (Extemporaneous.) Citric acid (cryst.), 20 grs.; carbonate of magnesium, 14 grs.; mix in a tumbler of cold water, and drink the mixture whilst effervescing. A pleasant saline.

Obs. A dry white powder, sometimes sold as citrate of magnesia in the shops, is quite a different preparation to the above, and does not contain a particle of citric acid. The following formula is that of a wholesale London drug-house that does largely in this article:—

Calcined magnesia, magnesium oxide, 1¼ lb. (or carbonate, 2 lbs.); powdered tartaric acid, 1½ lb.; bicarbonate of sodium, 1 lb.; dry each article by a gentle heat, then mix them, pass the mixture through a fine sieve in a warm dry room, and keep it in well-corked bottles. A few drops of essence of lemon and 3 lbs. of finely powdered sugar are commonly added to the above quantity. This addition renders it more agreeable.

Prop., &c. Citrate of magnesium is a mild and agreeable laxative; its secondary effects resemble those of the carbonate.—*Dose.* As a purgative, ½ to 1 oz. The dose of the effervescing citrate must depend on the quantity of magnesia present. A solution of this salt in water, sweetened and flavoured with lemon, forms magnesian lemonade.

Magnesium, Boro-cit'rate of. *Syn.* MAGNESIÆ BORO-CITRAS, L. *Prep.* (Cadet.) Boracic acid (in powder), 113 grs.; oxide of magnesium, 80 grs.; mix in a porcelain capsule, and add enough of a solution of citric acid, 260 grs., in water, 3½ pints, to form a thin paste; then add the remainder of the citric solution, and gently evaporate, with constant stirring, to dryness. A cooling saline, and, in small doses, emmenagogue and lithontriptic.—*Dose.* As an aperient, 3 to 6 drs.

Magnesium, Oxide of. MgO. *Syn.* OXIDE OF MAGNESIUM, CALCINED MAGNESIA, MAGNESIA (B. P., Ph. L.).

Prep. 1. (B.P.) Magnesium carbonate, heated in a crucible until all the carbonic anhydride is driven off.

Prop., &c. White heavy powder, scarcely soluble in water, but readily soluble in acids without effervescence. Its solution in hydrochloric acid, neutralised by a mixed solution of ammonia and ammonium Chloride, gives a copious crystalline precipitate when sodium phosphate is added to it. See next preparation.

Magnesia levis. (B. P.) *Syn.* LIGHT MAGNESIA. *Prep.* (B. P.) 1. Light carbonate of magnesium heated in a cornish crucible until all the carbonic anhydride is driven off.

A bulky white powder, differing from the magnesia (B. P.) only in its density, the volume occupied by the same weight being 3½ to 1.

The properties of the two varieties of magnesium oxide are identical, and are used in medicine as antacids, laaxitives, and antitithics, and much used in dyspepsia, heartburn, &c. —*Dose.* 10 to 20 grs. as an antacid and 20 to 60 grs. as a purgative.

Magnesium, Phos'phate of. $MgHPO_4$, 6Aq. *Syn.* MAGNESIÆ PHOSPHAS, L. *Prep.* From the mixed solutions of phosphate of sodium and sulphate of magnesium, allowed to stand for some time. Small, colourless, prismatic crystals, which, according to Graham, are soluble in about 1000 parts of cold water. Phosphate of magnesium exists in the grains of the cereals, and in considerable quantity in beer. It is also found in guano.

Magnesium and Ammo''nium, Phosphate of. $MgNH_4.PO_4$, 6 Aq. *Syn.* AMMONIO-PHOSPHATE OF MAGNESIA; MAGNESIÆ ET AMMONIÆ PHOSPHAS, L. This compound falls as a white crystalline precipitate whenever ammonia or carbonate of ammonium is added, in excess, to a solution of a salt of magnesium which has been previously mixed with a soluble phosphate, as that of soda. It subsides immediately from concentrated solutions, but only after some time from very dilute ones.

Prop., *&c.* Ammonio-phosphate of magnesium is very slightly soluble in pure water; when heated, it is resolved into pyrophosphate of magnesium, and is vitrified at a strong red heat. It is found in wheaten bran, guano, potatoes, &c., and occasionally forms one of the varieties of urinary calculi.

Magnesium, Sil′icates of. There are several native silicates of magnesia, more or less pure, of which, however, none is directly employed in medicine. Meerschaum and steatite or soapstone are well-known varieties. Serpentine is a compound of silicate and hydrate of magnesium. The minerals augite and hornblende are double salts of silicic acid, magnesium, and calcium with some ferrous oxide. The beautiful crystallized mineral called chrysolite is a silicate of magnesium, coloured wiih ferrous oxide. Jade is a double silicate of magnesium and aluminum, coloured with chromic oxide.

Magnesium, Sulphate of. $MgSO_4$, 7 Aq. *Syn.* EPSOM SALT, MAGNESIÆ SULPHAS (B. P. Ph. L. E. & D.), SAL EPSOMENSIS, L. This compound was originally extracted from the saline springs of Epsom, Surrey, by Dr. Grew, in 1695. It is now exclusively prepared on the large scale, and from either magnesian limestone or the residual liquor of the sea-salt works.

Prep. 1. From dolomite or magnesian limestone.—*a.* The mineral, broken into fragments, is heated with a sufficient quantity of dilute sulphuric acid to convert its carbonates into sulphates; the sulphate of magnesium is washed out of the mass with hot water, and the solution, after defecation, is evaporated and crystallized.

b. The 'limestone,' either simply broken into fragments or else calcined (burnt), and its constituent quicklime and oxide magnesium converted into hydrates by sprinkling (slaking) it with water, is treated with a sufficient quantity of dilute hydrochloric acid to dissolve out all the calcinum hydrate without touching the magnesium hydrate; the residuum of the latter, after being washed and drained, is dissolved in dilute sulphuric acid, and crystallized as before.

2. From bittern.—*a.* The residual liquor or mother-water of sea-salt is boiled for some hours in the pans which are used during the summer for the concentration of brine; the saline solution is then skimmed and decanted from some common salt which has been deposited, after which it is concentrated by evaporation, and, finally, run into wooden coolers; in about 36 hours, 1-8th part of Epsom salts usually crystallizes out. This is called 'singles.' By re-dissolving this in water, and re-crystallization, 'doubles,' or Epsom salts fit for the market, are obtained. A second crop of crystals may be procured by adding sulphuric acid to the mother-liquor, and re-concentrating the solution, but this is seldom had recourse to in England. Bittern yields fully 5 parts of sulphate of magnesia for every 100 parts of common salt that has been previously obtained from it.

b. A concentrated solution of sulphate of sodium is added to bittern, in equivalent proportion to that of the chloride of magnesium in it, and the mixed solution is [evaporated at the temperature of 122° Fahr. (Ure); cubical crystals of common salt are deposited as the evaporation proceeds, after which, by further concentration and repose, regular crystals of sulphate of magnesia are obtained.

c. A sufficient quantity of calcined and slaked magnesian limestone is boiled in bittern to decompose the magnesium salts, and the liquid is evaporated, &c., as before. This is a very economical process.

Prop. Small acicular crystals, or (by careful crystallization) large four-sided rhombic prisms; colourless; odourless, transparent; slightly efflorescent; extremely bitter and nauseous; when heated, it fuses in its water of crystailization, the larger portion of which readily passes off, but one equivalent of water is energetically retained; at a high temperature it runs into a species of white enamel; it dissolves in its own weight of cold water, and in 3-4ths of that quantity of boiling water; it is insoluble in both alcohol and ether. Sp. gr. 1·66.

Pur. Sulphate of magnesium is soluble in an equal weight of water at 60° Fahr., by which it may be distinguished from sulphate of sodium, which is much more soluble.

An aqueous solution in the cold is not precipitated by oxalate of ammonium. The precipitate given by carbonate of sodium from a solution of 100 grs. should, after well washing and heating to redness, weigh 16·26 grs. (B. P.)

Digested in alcohol, the filtered liquid does not yield a precipitate with nitrate of silver, nor burn with a yellcw flame, and evaporates without residue. "Not deliquescent in the air." (Ph. L.) 100 grs. of the pure crystallized sulphate yield 16¼ grs. of calcined magnesium oxide. (Pereira.) 10 grs., dissolved in 1 fl. oz. of water, and treated with a solution of carbonate of ammonium, are not entirely precipitated by 280 minims of solution of phosphate of sodium. (Ph. E.)

Uses, *&c.* Sulphate of magnesium is an excellent cooling purgative, and sometimes proves diuretic and diaphoretic.—*Dose.* 1 dr to 1 oz., as a purgative, or an antidote in poisoning by lead. Large doses should be avoided. Instances are on record of their having proved fatal. Dr. Christison mentions the case of a boy 10 years old, who swallowed 2 oz. of salts, and died within 10 minutes. Tho best antidote is an emetic. A small quantity of Epsom salts, largely diluted with water (as a drachm to ¼ pint or ¾ pint), will usually purge as much as the common dose. This increase of power has been shown by Liebig to result rather from the quantity of water than the salt. Pure water is greedily taken up by the absorbents; but water holding in solution saline matter is rejected by those vessels, and consequently passes off by the intestines.

Obs. Oxalic acid has occasionally been mistaken for Epsom salt, with fatal results. They may be readily distinguished from each other by the following characteristics:—

EPSOM SALT.	OXALIC ACID.
Tastes extremely bitter and nauseous.	Tastes extremely sour.
Turns milky when dissolved in water and mixed with carbonate of sodium or carbonate of potassium; and after a time, a white sediment subsides.	Effervesces when mixed with carbonate of sodium or carbonate of potassium, and the liquid in a few seconds becomes transparent.

Magnesium, Tar'trate of. *Syn.* MAGNESIÆ TARTRAS, MAGNESIA TARTARICA, L. *Prep.* By saturating a solution of tartaric acid with carbonate of magnesium, and gently evaporating to dryness. It is only very slightly soluble in water.—*Dose.* 20 to 60 grs., or more; in painful chronic maladies of the spleen. (Pereira, *ex* Radmacher.) The effervescing tartrate of magnesium, commonly sold under the name citrate has already been noticed.

Magnesium and Potas'sium, Tartrate of. *Syn.* POTASSIO-TARTRATE OF MAGNESIA; MAGNESIÆ POTASSIO-TARTRAS, M. ET POTASSÆ TARTRAS, L. *Prep.* From acid tartrate of potassium (in powder,) 7 parts; carbonate of magnesium, 2 parts; water 165 parts; boiled until the solution is complete, and then evaporated and crystallized. A mild aperient.—*Dose.* 1 to 5 drs.; in scurvy, &c.

MAG'NET. *Syn.* MAGNES, L. Besides its application to the loadstone, this name was formerly given to several compounds used in medicine.—ARSENICAL MAGNET (MAGNES ARSENICALIS), a substance once used as a caustic, consisted of common antimony, sulphur, and arsenious acid, fused together until they formed a sort of glass. MAGNES EPILEPSIÆ was native cinnabar.

MAHOG'ANY. This is the wood of *Swietenia Mahogoni* (Linn.), a native of the hotter parts of the new world. It is chiefly imported from Honduras and Cuba. The extract is astringent, and has been used in tanning, and as a substitute for cinchona bark. The wood is chiefly employed for furniture and ornamental purposes, and, occasionally, in ship-building.

Imitations of mahogany are made by staining the surface of the inferior woods by one or other of the following methods:

1. Warm the wood by the fire, then wash it over with aquafortis, let it stand 24 hours to dry, and polish it with linseed oil reddened by digesting alkanet root in it; or, instead of the latter, give the wood a coat of varnish, or French polish which has been tinged of a mahogany colour with a little aloes and annotta.

2. Socotrine aloes, 1 oz.; dragon's blood, ½ oz.; rectified spirit, 1 pint; dissolve, and apply 2 or 3 coats to the surface of the wood, previously well smoothed and polished; lastly, finish it off with wax or oil tinged with alkanet root.

3. Logwood, 2 oz.; madder, 8 oz.; fustic, 1 oz.; water, 1 gal.; boil 2 hours, and apply it several times to the wood boiling hot; when dry, slightly brush it over with a solution of pearlash, 1 oz.; in water, 1 quart; dry, and polish as before.

4. As the last, but using a decoction of logwood, 1 lb., in water, 5 pints. The tint may be brightened by adding a little vinegar or oxalic acid, and darkened by a few grains of copperas.

Stains and spots may be taken out of mahogany furniture with a little aquafortis or oxalic acid and water, by rubbing the part with the liquid, by means of a cork, till the colour is restored; observing afterwards to well wash the wood with water, and to dry it and polish it as before.

MAIZE. *Syn.* INDIAN CORN. The seeds of *Zea Mays* (Linn.). Like the other corn plants, it belongs to the Grass family (*Graminaceæ*), and has albuminous grains sufficiently large and farinaceous to be ground into flour.

Maize is extremely nutritious, and although it is poorer in albuminoid matters than wheat, it is, of all the cereal grains, the richest in fatty oil, of which it contains about 9%. (Dumas and Payen.) It is remarkable for its fattening quality on animals, but it is apt to excite slight diarrhœa in those unaccustomed to its use. Its meal is the 'POLENTA' of the shops. The peculiar starch prepared from it is known as 'CORN FLOUR,' 'MAIZENA,' &c. In America, the young ears are roasted and boiled for food.

The centesimal composition of maize is as follows:—Flesh formers (albuminoid bodies), 9·9; heat and fat formers (starch, dextrin, and fat), 71·2, fibre, 4·0; ash, 1·4; water, 13·5.

MALAG'MA. In *pharmacy*, a poultice or emollient application.

MA'LIC ACID. $H_3C_4H_3O_5$. *Syn.* ACIDUM MALICUM, L. This acid exists in the juice of many fruits and plants, either alone, or associated with other acids, or with potassa or lime. In the juice of the garden rhubarb, it exists in great abundance, being associated with acid oxalate of potassa.

Prep. (Everitt.) The stalks of common garden rhubarb are peeled, and ground or grated to a pulp, which is subjected to pressure; the juice is heated to the boiling-point, neutralized with carbonate of potassa, mixed with acetate of lime, and the insoluble oxalate of lime which falls is removed by filtration; to the clear and nearly colourless liquid, solution of acetate of lead is next added as long as a precipitate ('malate of lead') continues to form; this is collected on a filter, washed, diffused through water, and decomposed by sulphuric acid, avoiding excess, the last portion of lead being thrown down by a stream of sulphuretted hydrogen; the filtered liquid is, lastly, carefully evaporated to the consistence of syrup, and left in a dry atmosphere until it becomes converted into a solid and somewhat crystalline mass of malic acid. If perfectly pure malic acid is required, the malate of lead must be crystallised before decomposing it with sulphuretted hydrogen. *Prod.* 20,000 grs. of the peeled stalks yield 12,500 grs. of juice, of which one imperial gallon contains 11,139¼ grs. of dry malic acid.

Obs. By a similar process, malic acid may be prepared from the juice of the berries of the mountain ash (*Sorbus aucuparia*), just when they commence to ripen, or from the juice of apples, pears, &c.

Prop., &c. Malic acid is slightly deliquescent, very soluble in water, soluble in alcohol, and has a pleasant acidulous taste. The aqueous infusion soon gets mouldy by keeping. When kept fused for some time at a low heat, it is converted into fumaric acid; and when quickly distilled, it yields maleic acid, while fumaric acid is left in the retort. With the bases malic acid forms salts called malates. Of these the acid malate of ammonia is in large, beautiful crystals; malate of lead is insoluble in cold water, but dissolves in warm dilute acid, from which it separates on cooling in brilliant silvery crystals; acid malate of lime also forms very beautiful crystals, freely soluble in water; neutral malate of lime is only sparingly soluble in water; the first is obtained by dissolving the latter in hot dilute nitric acid, and allowing the solution to cool very slowly.

MALLEABIL'ITY. The peculiar property of metals which renders them capable of extension under the hammer.

MALT. *Syn.* BINA, BYNE, BRASIUM, MALTUM, L. The name given to different kinds of grain, such as barley, bere or bigg, oats, rye, maize, &c., which have become sweet, from the conversion of a portion of their starch into sugar, in consequence of incipient germination artificially produced. Barley is the grain usually employed for this purpose.

Var. Independently of variations of quality, or of the grain from which it is formed, malt is distinguished into varieties depending on the heat of the kiln employed for its desiccation. When dried at a temperature ranging between 90 and 120° Fahr., it constitutes 'PALE MALT;' when all the moisture has exhaled, and the heat is raised to from 125 to 135°, 'YELLOW,' or 'PALE AMBER MALT,' is formed; when the heat ranges between 140° and 160°, the product receives the name of 'AMBER MALT;' at 160° to 180°, 'AMBER-BROWN,' or 'PALE BROWN MALT,' is obtained. ROASTED, PATENT, or BLACK MALT, and CRYSTALLISED MALT, are prepared by a process similar to that of roasting coffee. The malt is placed in sheet iron cylinders over a strong fire, and the cylinders made to revolve at the rate of about 20 revolutions per minute if roasted malt is required, or 120 if for crystallised malt. In the former case the finished malt has a dark brown colour; in the latter, the interior of the grain becomes dark brown, whilst the husk assumes a pale amber hue. The temperature must never exceed 420°, or the malt will become entirely carbonised.

Qual. Good malt has an agreeable smell and a sweet taste. It is friable, and when broken discloses a floury kernel. Its husk is thin, clean, and unshrivelled in appearance, and the acrospire is seen extending up the back of the grain, beneath the skin. The admixture of unmalted with malted grain may be discovered, and roughly estimated, by throwing a little into water, malt floats on water, but barley sinks in it. The only certain method, however, of determining the value of malt is to ascertain the amount of soluble matter which it contains, by direct experiment. This varies from 62 to 70%, and for good malt is never less than 66 to 67%. If we assume the quarter of malt at 324 lbs., and the average quantity of soluble matter at 66%, then the total weight of soluble matter will be fully 213¾ lbs. per quarter; but as this, "in taking on the form of gum and sugar" during the process of mashing, "chemically combines with the elements of water, so the extract, if evaporated to dryness, would reach very nearly 231 lbs.; and this reduced to the basis of a barrel of 36 gallons, becomes in the language of the brewer, 87 lbs. per barrel, which, however, merely means that the wort from a quarter of malt, if evaporated down to the bulk of a barrel or 36 gallons, would weigh 87 lbs. more than a barrel of water." (Ure.)

Assay. 1. A small quantity of the sample being ground in a coffee or pepper mill, 100 grs. are accurately weighed, and dried by exposure for about 1 hour at the temperature of boiling water. The loss in weight, in grains, indicates the quantity of moisture per cent. This, in good malt, should not exceed 6½ grs.

2. A second 100 grs. is taken and stirred up with about ½ pint of cold water; the mixture is then exposed to the heat of boiling water for about 40 minutes; after which it is thrown on a weighed filter, and the undissolved portion washed with a little hot water; the undissolved portion, with the filter, is then dried at 212° Fahr., and weighed. The loss in weight, less the per-centage of moisture last found, taken in grains, gives the per-centage of soluble matter. This should not be less than 66 grs. The same result will be arrived at by evaporating the filtered liquid and 'washings' to dryness, and weighing the residuum.

3. A third 100 grs. is taken and mashed with about ½ pint of water at 160° Fahr., for 2 or 3 hours; the liquid is then drained off, the residue gently squeezed, and the strained liquid, evaporated to dryness, as before, and weighed. This gives the per-centage of saccharine matter, and should not be less than about 71 grs., taking the above average of malt as the standard of calculation.

Uses, &c. Malt is chiefly employed in the arts of brewing and distillation. Both roasted and crystallised malt are merely used to colour the worts produced from pale malt. 1 lb. of roasted malt, mashed with 79 lbs. of pale malt, imparts to the liquor the colour and flavour of 'porter.' The paler varieties of malt contain the largest quantity of saccharine matter. After the malt has been kiln-dried, the rootlets may be removed by means of a sieve. Before malt is mashed for beer, it must be broken up, and the law requires that it be bruised or crushed by smooth metal rollers, and not ground by mill stones. It has also been proposed to employ malt, instead of raw grain, for fattening domestic animals, and as food for their young and those in a sickly state. Infusion of milk (sweet wort, malt tea) is laxative, and has been recommended as an antiscorbutic and tonic. It has been given with great advantage in scurvy; but for this purpose good, well-hopped, mild beer is equally serviceable and more agreeable. See Brewing, Distillation, Fermentation, &c.

MALT LIQ'UORS. The qualities of ale, beer, and porter, as beverages, the detection of their adulteration, and the methods of preparing them, are described under their respective names and in the article upon 'brewing'; the present article will, therefore, be confined to a short notice of the cellar management, and the diseases of malt liquors generally.

Age. The appearance and flavour to which this term is applied can, of course, be only given to the liquor by properly storing it for a sufficient time. Fraudulent brewers and publicans, however, frequently add a little oil of vitriol (diluted with water) to new beer, by which it assumes the character of an inferior liquor of the class 1 or 2 years old. Copperas, alum, sliced lemons, Seville oranges, and cucumbers, are also frequently employed by brewers for the same purpose.

Bottling. Clean, sweet, and dry bottles, and sound and good corks, should be had in readiness. The liquor to be bottled should be perfectly clear; and if it be not so, it must be submitted to the operation of 'fining.' When quite fine, and in good condition, the bung of the cask should be left out all night, and the next day the liquor should be put into bottles, which, after remaining 12 or 24 hours, covered with sheets of paper to keep out flies and dust, must be securely corked down. Porter is generally wired over. The wire for this purpose should be 'annealed,' and not resilient. If the liquor is intended for exportation to a hot climate, the bottles should remain filled for 2 or 3 days, or more, before corking them. The stock of bottled liquor should be stored in a cool situation; and a small quantity, to meet present demands only, should be set on their sides in a warmer place to ripen. October beer should not be bottled before Midsummer, nor March beer till Christmas.

Cloudiness. Add a handful of hops boiled in a gallon of the beer, and in a fortnight fine it down.

Fining. See Clarification and Brewing.

Flatness. When the liquor is new, or has still much undecomposed sugar left in it, a sufficient remedy is to remove it into a warmer situation for a few days. When this is not the case, 2 or 3 pounds of moist sugar (foots) may be 'rummaged' into each hogshead. In this way a second fermentation is set up, and in a few days the liquor becomes brisk, and carries a head. This is the plan commonly adopted by publicans. On the small scale, the addition of a few grains of carbonate of soda, or of prepared chalk, to each glass, is commonly made for the same purpose; but in this case the liquor must be drunk within a few minutes, else it becomes again flat and insipid. This may be adopted for home-brewed beer which has become sour and vapid.

Foxing or bucking. The spontaneous souring of worts or beer during their fermentation or ripening, to which this name is applied, may generally be remedied by adding to the liquor some fresh hops (scalded), along with some black mustard seed (bruised). Some persons use a little made mustard, or a solution of alum or of catechu, and in a week or 10 days afterwards further add some treacle, or moist sugar.

Frosted beer is recovered by change of situation; by the addition of some hops boiled in a little sweet wort; or, by adding a little moist sugar or treacle to induce a fresh fermentation.

Heading. This is added to thin and vapid beer to make it bear a frothy head. The most innocent, pleasant, and effective addition of this sort is a mixture of pure ammonio-citrate of iron and salt of tartar, about equal parts, in the proportion of only a few grains to a quart.

Improving. This is the trade synonym of 'adulteration' and 'doctoring.' Nevertheless there are cases in which 'improvement' may be made without affecting the wholesome character of the liquor. Of this kind is the addition of hops, spices, &c., during the maturation of beer that exhibits a tendency to deteriorate. For this purpose some persons cut a half-quartern loaf into slices, and after toasting them very high, place them in a coarse linen bag along with ½ lb. of hops, and 2 oz. each of bruised ginger, cloves, and mustard seed, and suspend the bag by means of a string a few inches below the surface of the beer (a hogshead), which is then bunged close. The addition of a little ground capsicum in the same way is also a real improvement to beer, when judiciously made.

MUSTINESS. To each hogshead, racked into clean casks, add 1 lb. of new hops boiled in a gallon of the liquor, along with 7 lbs. of newly-burnt charcoal (coarsely bruised, and the fine dust sifted off), and a 4-lb. loaf of bread cut into thin slices and toasted rather black; 'rouse up' well every day for a week, then stir in of moist sugar 3 or 4 lbs., and bung down for a fortnight.

RECOVERING. This is said of unsaleable beer when rendered saleable, by giving it 'head' or removing its 'tartness.'

RIPENING. This term is applied to the regular maturation of beer. It is also used to express the means by which liquors already mature are rendered brisk, sparkling, or fit and agreeable for immediate use. In the language of the cellar, malt liquors are said to be 'up' when they are well charged with gaseous matter, and bear a frothy head. These qualities depend on the undecomposed sugar undergoing fermentation, which, when active, can only be of comparatively short duration, and should, therefore, be repressed rather than excited in beers not required for immediate consumption. When we desire to give 'briskness' to these liquors, whether in cask or bottle, it is only necessary to expose them for a few days to a slight elevation of temperature, by removing them, for instance, to a warmer apartment. This is the plan successfully adopted by bottlers. The addition of a small lump of white sugar to each bottle of ale or beer, or a teaspoonful of moist sugar to each bottle of porter, just before corking it, will render it fit for drinking in a few days in ordinary weather, and in 2 or 3 days in the heat of summer. A raisin or a lump of sugar candy is often added to each bottle with a like intention. The Parisians bottle their beer one day and sell it the next. For this purpose, in addition to the sugar as above, they add 2 or 3 drops of yeast. Such bottled liquor must, however, be drunk within a week, or else stored in a very cold place, as it will otherwise burst the bottles or blow out the corks.

ROPINESS. A little infusion of catechu or of oak bark, and some fresh hops, may be added to the beer, which in a fortnight should be rummaged well, and the next day 'fined' down.

SOURNESS. Powdered chalk, carbonate of soda, salt of tartar, or pearlash, is commonly added by the publicans to the beer, until the acidity is nearly removed, when 4 or 5 lbs. of moist sugar or foots per hogshead are 'rummaged' in, together with sufficient water to disburse double the amount of the outlay and trouble. Such beer must be soon put on draught, as it is very apt to get flat by keeping. Oyster shells and egg shells are also frequently used by brewers for the same purpose. To remove the acidity of beer, on the small scale, a few grains of carbonate of soda per glass may be added just before drinking it.

STORING. The situation of the beer-cellar should be such as to maintain its contents at a permanently uniform temperature, ranging between 44° and 50° Fahr., a condition which can only be ensured by choosing for its locality an underground apartment, or one in the centre of the basement portion of a large building.

VAMPING. Half fill casks with the old liquor, fill them up with some newly brewed, and bung close for 3 weeks or a month.

MALTING. The method of converting barley, wheat, oats, or any other description of grain into malt. There are four successive stages in the process of malting, viz. steeping, couching, flooring, and kiln-drying.

1. *Steeping or moistening.*—The grain is placed in a large wooden or stone cistern, and sufficient water run in to cover it. Here it remains for a period of from 40 to 60 hours, depending on the temperature of the weather, or until it becomes soft enough to be easily pierced with a needle, or crushed between the thumb and finger without yelding a milky juice. While in steep the grain swells, increasing nearly one fifth in bulk, and about 50 per cent. in weight. The water is then drained off, and the grain is ready for the next operation,

2. *Couching or germinating.*—From the cistern the swollen barley is thrown out into the couch frame to the depth of from 14 or 20 inches, where heat is generated and germination induced. Here it is allowed to remain for from 20 to 30 hours, according to the state of the weather, until the acrospire or pumule shoots forth. Were the grain to remain long in the couch, particularly in warm weather, it would be either unduly forced or turn sour. Whilst in couch it rises in temperature about 15 degrees, and gives off some of its extra moisture. This is called sweating, and as the rootlets now begin to shoot out, means must be taken to check the germination.

2. *Flooring or regulating.*—This consists in spreading the heated barley on the floor at different depths, according as it is required to increase or retard germination. During this stage of the operation the art of the maltster may be more properly said to commence, as now all his judgment is brought into requisition. The grain must be turned three or four times a day, and at each turning the layer is spread out more and more, until it is reduced to the depth of about three or four inches. The chief object to be attained by this operation is a regular germination of the grain.

4. *Kiln-drying.*—The sprouted barley is next spread in a thin layer on the malt kiln, and heat applied. The temperature to which the kiln is raised varies according to the pur-

pose for which the malt is required, the difference between pale, amber, and brown malt, depending solely on the degree of heat to which each has been subjected, and the manner in which the heat has been applied (see MALT). If the malt were not kiln-dried it would not keep, but would become mouldy. By the process of drying, the vitality of the seed is destroyed, and it may then be preserved without suffering further change.

Product.—Good barley yields about 80% by weight and 109% by measure, of dried and sifted malt. Of the loss by weight, 12% must be referred to water existing in the raw grain.

MAN″GANESE. Mn. *Syn.* MANGANESIUM, L. A hard, brittle metal, discovered by Gahn in the black oxide of manganese of commerce.

Prep. Reduce manganous carbonate to fine powder, make it into a paste with oil, adding about 1-10th of its weight of calcined borax, place the mixture in a Hessian crucible lined with charcoal, lute on the cover, and expose it to the strongest heat of a smith's forge for 2 hours; when cold, break the crucible and preserve the metallic button in naphtha.

Obs. The product is probably a carbide of manganese, just as steel is a carbide of iron. Deville has lately prepared pure manganese by reducing the pure oxide by means of an insufficient quantity of sugar charcoal in a crucible made of caustic lime.

Prop. As prepared by Deville, metallic manganese has a reddish lustre, like bismuth; it is very hard and brittle; when powdered, it decomposes water, even at the lowest temperature. Dilute sulphuric acid dissoves it with great energy, evolving hydrogen. Sp. gr. 7·13. In an oxidised state manganese is abundant in the mineral kingdom, and traces of it have been found in the ashes of plants and in mineral waters.

The salts of manganese may be easily prepared in a state of purity by dissolving the precipitated carbonate in the acids. Most of them are soluble, and several are crystallisable.

Tests. Manganous salts are distinguished as follows:—The hydrates of potassium and sodium give white precipitates insoluble in excess, and rapidly turning brown. The presence of ammonium salts interferes with these tests. Ammonia gives similar results.

Ferrocyanide of potassium gives a white precipitate. Sulphuretted hydrogen gives no precipitate in acid solutions, and precipitates neutral solutions only imperfectly; but in alkaline solutions it gives a bright, flesh-coloured, insoluble precipitate, which becomes dark brown on exposure to the air. Sulphide of ammonium in neutral solutions, also yields a similar precipitate, which is very characteristic. A compound of manganese fused with borax in the outer flame of the blowpipe gives a bead, which appears of a violet-red colour whilst hot, and upon cooling acquires an amethystine tint; this colour is lost by fusion in the inner flame. Heated upon platinum foil with a little carbonate of sodium, in the outer flame, it yields a green mass whilst hot, which becomes bluish green when cold.

Manganous Ace′tate. $Mn(C_2H_3O_2)_2$. *Syn.* ACETATE OF PROTOXIDE OF MANGANESE; MANGANII ACETAS, L. *Prep.* 1. By neutralising concentrated acetic acid with manganous carbonate, and evaporating the solution so that crystals may form.

Prop., &c. The crystals, when pure, are of a pale red colour; permanent in the air; soluble in alcohol, and in 3½ parts of water, and possess an astringent and metallic taste.—*Dose.* 5 to 10 grs., as an alterative, hæmatinic, &c.

Manganous Car′bonate. $MnCO_3$. *Syn.* CARBONATE OF PROTOXIDE OF MANGANESE; MANGANESII CARBONAS, L. *Prep.* Reduce the black oxide of manganese of commerce to fine powder, and after washing it in water acidulated with hydrochloric acid, dissolve it in strong hydrochloric acid, and evaporate the resulting solution to dryness; dissolve the residue in water, and add to the solution sufficient sodium carbonate to precipitate all the iron present; digest the mixed precipitate in the remainder of the liquid, filter, add ammonium sulphide until it begins to produce a flesh-coloured precipitate, then filter, and add sodium carbonate as long as a precipitate falls; lastly, well wash the newly-formed carbonate in water, and dry it by a gentle heat.

2. By directly precipitating a solution of the chloride with sodium carbonate, and washing and drying the powder, as before.

Prop., &c. A pale buff or cream-coloured powder; insoluble in water; freely soluble in acids; exposed to a strong heat, it loses its carbonic acid, absorbs oxygen, and is converted into the red oxide. It is chiefly employed in the preparation of the other salts of manganese.

Manganous Chlo″ride. $MnCl_2$. *Syn.* PROTOCHLORIDE OF MANGANESE, MURIATE OF M.; MANGANESII CHLORIDUM, L. *Prep.* 1. By saturating hydrochloric acid with manganous carbonate; the solution is gently concentrated by evaporation, when crystals may be obtained, or it is at once evaporated to dryness; in either case the product must be placed in warm, dry, stoppered bottles, and preserved from the air.

2. From the dark brown residual liquid of the process of obtaining chlorine from binoxide of manganese and hydrochloric acid; this liquid is evaporated to dryness, and then slowly heated to dull redness in an earthen vessel, with constant stirring, and kept at that temperature for a short time; the grayish-looking powder thus obtained is treated with water, and the solution separated from the ferric oxide and other insoluble matter by filtration; if any iron still remains, a little

manganous carbonate is added, and the whole boiled for a few minutes; the filtered solution is then treated as before. This is the least expensive and convenient source of this salt.

Prop., &c. Rose-coloured tabular crystals; inodorous; very soluble both in water and alcohol; very deliquescent; when gradually heated to fusion, the whole of the water is expelled, and at a red heat it slowly suffers decomposition. Astringent, tonic, hæmatinic, and alterative.—*Dose.* 3 to 10 grs.; in scorbutic, syphilitic, and certain chronic cutaneous affections; anæmia, chlorosis, &c.

Manganous Hydrate. $Mn(HO)_2$. *Syn.* HYDRATED PROTOXIDE OF MANGANESE. *Prep.* Formed by adding potassium hydrate to manganous sulphate, and filtering and drying, the precipitate in vacuo. White powder rapidly absorbing oxygen and burning first green and then brown from formation of higher oxides.

Manganous I'odide. MnI_2. *Syn.* MANGANESII IODIDUM, L. *Prep.* By dissolving the carbonate in hydriodic acid, and evaporating the filtered liquid in vacuo or out of contact with air.—*Dose.* 1 to 3 grs.; in anæmia, chlorosis, &c., occurring in scrofulous subjects.

Manganous Oxide. MnO. *Syn.* PROTOXIDE OF MANGANESE. *Prep.* By passing a current of hydrogen over manganous carbonate heated to whiteness in a porcelain tube. Olive green powder rapidly oxidizing on exposure to air, and soluble in acids forming manganous salts.

There are four other oxides and two oxyhydrates that may be treated of here, but of which only the peroxyde and the manganates and permanganates are of practical importance.

Manganous-manganic Oxide. Mn_3O_4, or MnO, Mn_2O_3. *Syn.* RED OXIDE OF MANGANESE, PROTOSESQUIOXIDE OF MANGANESE. Found native as "Hansmanite." It is produced by igniting manganous carbonate, or manganic, oxide, or manganic peroxide. Reddish-brown, coloured crystals or powder, and communicates an amethyst colour to glass when fused with it.

Manganous-manganic Peroxide. Mn_4O_7, or MnO_2, Mn_2O_3. *Syn.* INTERMEDIATE OXIDE OF MANGANESE. Found native as "Varvicile," as a black hard crystalline mass. Decomposed when heated into a lower oxide and oxygen.

Manganous Phosphate. $MnH.PO_4 + 6Aq$. *Syn.* PHOSPHATE OF PROTOXIDE OF MANGANESE; MANGANESII PHOSPHAS, L. *Prep.* By precipitating a solution of manganous sulphate with a solution of sodium phosphate. It must be preserved from the air.—*Dose.* 3 to 12 grs.; in anæmia, rickets, &c.

Manganous Sul'phate. $MnSO_4$. *Syn.* SULPHATE OF PROTOXIDE OF MANGANESE; MANGANESII SULPHAS, L. *Prep.* 1. By dissolving manganous carbonate in dilute sulphuric acid, and evaporating the filtered solution so that crystals may form, or at once gently evaporating it to dryness. Pure.

2. (Commercial.) By igniting manganic peroxide (pyrolusite) mixed with about 1-10th of its weight of powdered coal in an iron crucible or gas-retort, and digesting the residuum of the calcination in sulphuric acid, with the addition after a time of a little hydrochloric acid; the solution of manganous sulphate thus obtained, after defecation, is evaporated to dryness, and heated to redness as before; the mass, after ignition, is crushed small, and treated with water; the solution is nearly pure, the whole of the iron having been reduced into the state of insoluble peroxide. *Used* by the calico-printers. Cloth steeped in the solution, and afterwards passed through a solution of chloride of lime, is dyed of a permanent brown.

Prop., &c. Pale rose-coloured crystals of the formulæ $MnSO_4, 7Aq$; $MnSO_4, 5Aq$; or $MnSO_4, 4Aq$, according to the method of crystallizing, furnishing a solution of a rich amethystine colour. With sulphate of potassa, it forms a double salt ('manganese alum').—*Dose.* As an alterative and tonic, 5 to 10 grs.; as a cholagogue cathartic, 1 to 2 drs., dissolved in water, either alone or combined with infusion of senna. According to Ure, its action is prompt and soon over; 1 dr. of it occasions, after the lapse of an hour or so, one or more liquid bilious stools. In large doses it occasions vomiting, and in excessive doses it destroys life by its caustic action on the stomach. (Dr. G. C.Mitscherlich.) It has been administered with manifest advantage in torpor of the liver, gout, jaundice, syphilis, and certain skin diseases; and, combined with iron, in anæmia, chlorosis, rickets, &c.

Manganous Tar'trate. $MnC_4H_4O_6$. *Syn.* MANGANESII TARTRAS, L. *Prep.* By saturating a solution of tartaric acid with moist manganous carbonate. Alterative and tonic. —*Dose.* 4 to 12 grs.

Manganic Acid. H_2MnO_4. This acid has not yet been obtained free, but some of its salts are extensively employed as disinfectants, as "green Condy's fluid." The chief compounds are the following:

Manganate of Barium. $BaMnO_4$. Green insoluble powder, obtained by fusing barium hydrate, potassium chlorate, and manganic peroxide together, and washing the product.

Manganate of Potassium. K_2MnO_4. Finely powdered manganic peroxide, potassium chlorate, and potassium hydrate, made into a thick paste with water, and heated to dull redness. The fused product is treated with a small quantity of water, and crystallized by evaporation in vacuo.

Dark green, almost black crystals, readily soluble in water, but decomposed by excess, or by acids into manganic peroxide, and potassium permanganate.

Manganate of Sodium. M_2MnO_4. Prepared on the large scale by heating a mixture of manganic peroxide and sodium hydrate to redness in a current of air. *Used* in strong solution as a disinfectant under the name of "Condy's green fluid."

Manganic Hydrate. $Mn_2(HO)_6$. *Syn.* HYDRATED SESQUIOXIDE OF MANGANESE. Found native as "manganite," in reddish-brown crystals. *Prep.* By passing a current of air through recently precipitated and moist manganous hydrate. Soft dark brown powder converted into the oxide by heat.

Manganic Oxide. Mn_2O_3. *Syn.* SESQUIOXIDE OF MANGANESE. Found native as "Braunite," and readily formed by exposing manganous hydrate to the action of air, and drying, or by gently igniting the peroxide brown or black powder decomposed by heat.

Manganic Peroxide. MnO_2. *Syn.* PERMANGANIC OXIDE, BINOXIDE OF MANGANESE, PEROXIDE OF MANGANESE, BLACK OXIDE OF MANGANESE, OXIDE OF MANGANESE, MANGANESII OXIDUM NIGRUM (B. P.), MANGANESII BINOXYDUM (Ph. L.), MANGANESE OXYDUM (Ph. E.).

It is the only oxide of manganese that is directly employed in the arts. It is a very plentiful mineral production, and is found in great abundance in some parts of the West of England. The manganese of the shop is prepared by washing, to remove the earthy matter and grinding in mills. The blackest samples are esteemed the best. It is chiefly used to supply oxygen gas, and in the manufacture of glass and chlorine; in dyeing and to form the salts of manganese. It has been occasionally employed in medicine, chiefly externally, in itch and porrigo, made into an ointment with lard. It has been highly recommended by Dr. Erigeler in scrofula. Others have employed it as an alterative and tonic with variable success. When slowly introduced into the system during a lengthened period, it is said to produce paralysis of the motor nerves. (Dr. Coupar.)—*Dose.* 3 to 12 grs., or more, thrice daily, made into pills.

Pur. Native binoxide of manganese (pyrolusite) is usually contaminated with variable proportions of argillaceous matter, calcium carbonate, ferric oxide, silica, and barium sulphate, all of which lower its value as a source of oxygen, and for the preparation of chlorine. The richness of this ore can, therefore, be only determined by an assay for its principal ingredient.

Assay. There are several methods adopted for this purpose, among which the following recommend themselves as being the most accurate and convenient.

1. A portion of the mineral being reduced to very fine powder, 50 grs. of it are put into the little apparatus employed for the analysis of carbonates described at page 295, together with about ¼ fl. oz. of cold water, and 100 grs. of strong hydrochloric acid, the latter contained in the little tube (*b*); 50 grs. of crystallized oxalic acid are then added, the cork carrying the chloride of calcium tube fitted in, and the whole quickly and accurately weighed or counterpoised; the apparatus is next inclined so that the acid contained in the small tube may be mixed with the other contents of the flask, and the reaction of the ingredients is promoted by the application of a gentle heat; the disengaged chlorine resulting from the mutual decomposition of the hydrochloric acid and the manganic peroxide converts the oxalic acid into carbonic acid gas, which is dried in its passage through the chloride of calcium tube before it escapes into the air. As soon as the reaction is complete, and the residual gas has been driven off by a momentary ebullition, the apparatus is allowed to cool, when it is again carefully and accurately weighed. The loss of weight in grains, if doubled, at once indicates the per-centage richness of the mineral examined in manganic peroxide; or, more correctly, every grain of carbonic anhydride evolved represents 1·982 gr. of the peroxide.

2. (Fresenius and Will.) The apparatus employed is the 'alkalimeter' figured at page 24. The operation is similar to that adopted for the assay of alkalies, and is a modification of the oxalic acid and sulphuric acid test for manganese, originally devised by M. Berthier. The standard weight of manganic peroxide recommended to be taken by Fresenius and Will is 2·91 grammes, along with 6·5 to 7 grammes of neutral potassium oxalate. The process, with quantities altered to adapt it for employment in the laboratories of these countries, is as follows:—Manganic peroxide (in very fine powder), 50 gr.; neutral potassium oxalate (in powder), 120 grs.; these are put into the flask *A* (see engr., p. 24), along with sufficient water to about 1-4th fill it; the flask *A* and *B* (the latter containing the sulphuric acid) are then corked air-tight, and thus connected in one apparatus, the whole is accurately weighed. The opening of the tube *b* being closed by a small lump of wax, a little sulphuric acid is sucked over from the flask *B* into the flask *A*; the disengagement of oxygen from the manganese immediately commences, and this reacting upon the oxalic acid present, converts it into carbonic anhydride gas, which passing through the concentrated sulphuric acid in the flask *B*, which robs it of moisture, finally escapes from the apparatus through the tube *d*. As soon as the disengagement of carbonic acid ceases, the operator sucks over a fresh portion of sulphuric acid, and this is repeated at short intervals, until bubbles of gas are no longer disengaged. The little wax stopper is now removed, and suction is applied at *h* until all the carbonic acid in the apparatus is replaced by common air. When the whole has become cold, it is again weighed. The loss of weight, doubled, indicates the amount of pure manganic peroxide, in the sample, as before.

3. (Otto.) 50 grs. of the sample reduced to

very fine powder, are mixed in a glass flask, with hydrochloric acid, 1½ fl. oz., diluted with ½ oz. of cold water, and portions of ferrous sulphate, from a weighed sample, immediately added; at first in excess, and afterwards, in smaller doses, until the liquid ceases to give a blue precipitate with red prussiate of potash, or to evolve the odour of chlorine; heat being employed towards the end of the process. The quantity of ferrous sulphate consumed is now ascertained by again weighing the sample. If the peroxide examined was pure, the loss of weight will be 317 grs.; but if otherwise, the per-centage of the pure peroxide may be obtained by the rule of three. Thus: suppose only 298 grs. of the sulphate were consumed, then

317 : 100 : : 298 : 94,

and the richness of the sample would be 94%. The per-centage value of the oxide for evolving chlorine may be obtained by multiplying the weight of the consumed ferrous sulphate by ·2588, which, in the above case, would give 76% of chlorine. For this purpose as well as for chlorometry, the ferrous sulphate is best prepared by precipitating it from its aqueous solution with alcohol, and drying it out of contact with air until it loses its alcoholic odour.

Obs. Before applying the above processes, it is absolutely necessary that we ascertain whether the peroxide examined contains any carbonates, as the presence of these would vitiate the results. This is readily determined by treating it with a little dilute nitric acid:—if effervescence ensues, one or more carbonates are present, and the sample, after being weighed, must be digested for some time in dilute nitric acid in excess, and then carefully collected on a filter, washed, and dried. It may then be assayed as before. The loss of weight indicates the quantity of carbonates present, with sufficient accuracy for technical purposes. The determination of this point is the more important, as these contaminations not merely lessen the richness of the mineral in pure manganic peroxide, but also cause a considerable waste of acid when it is employed in the manufacture of chlorine.

Permanganic Acid. $HMnO_4$. Obtained by distilling cautiously potassium permanganate and sulphuric acid. Dark violet—black liquid, green by reflected light, and rapidly absorbing water forming a violet solution. Oxidises organic matter with explosive violence.

Permanganate of Barium. $Ba(MnO_4)_2$. Black soluble prisms, formed by decomposing silver permanganate by means of barium chloride, and cautiously evaporating.

Permanganate of Potassium. $HMnO_4$. *Prep.* Potassium chlorate, or nitrate, and potassium hydrate is made into a paste with water, and manganic peroxide added; the mass is dried and heated to redness. The residue is boiled with water, filled through asbestos, and evaporated down and recrystallized.

Dark purple, red, almost black anhydrous long prisms, readily soluble in 16 pints of water. Decomposed in presence of acids by most organic matter.

Permanganate of Silver. $AgMnO_4$. *Prep.* Precipitate a strong solution of silver nitrate by means of a concentrated solution of potassium permanganate. Small black prisms, soluble in 100 parts of water, with a purple colour.

Permanganate of Sodium. $NaMnO_4$. Obtained as a dark purple liquid by passing a current of carbonic anhydride through sodium manganate. Condy red fluid is chiefly a sodium permanganate dissolved in water.

MANGE. An eruptive disease, corresponding to the itch in man, resulting from the burrowing into the skin of minute animalcules (mites or *acari*), and common to several domestic animals, more especially the dog and horse. Like the itch, it is contagious. The causes are confinement, dirt, and bad living. The treatment should consist in the immediate removal of the cause, the frequent use of soft soap and water, followed by frictions with sulphur ointment or by solution of chloride of lime, the administration of purgatives, and a change to a restorative diet. Dun states, that in India a very efficient remedy for mange is employed by the native farriers, which consists of castor oil seeds well bruised, steeped for twelve hours in sour milk, and rubbed into the skin, previously thoroughly cleansed with soap and water. "The itchiness disappears almost immediately, and the acari are speedily destroyed." A dressing consisting of 1 oz. of chloride of zinc (Burnett's disinfectant fluid) and 1 quart of water may also be applied with advantage.

MAN″GEL WUR′ZEL. *Syn.* MANGOLD-WURZEL, HYBRID BEET, ROOT OF SCARCITY. The *Beta vulgaris*, var. *campestris*, a variety of the common beet. The root abounds in sugar, and has been used in Germany as a substitute for bread in times of scarcity. In these countries it is chiefly cultivated as food for cattle. The young leaves are eaten as spinach. The per-centage composition of mangold wurzel is as follows:—Flesh-formers (albuminoid bodies), 1·54; heat and fat-formers (sugar, &c.), 8·60; indigestible fibre, 1·12; ash, 0·96; 87·78.

MANHEIM GOLD. A gold-coloured brass. See GOLD (Dutch).

MAN′NA. *Syn.* MANNA (B. P., Ph. L. E. & D.), L. A concrete exudation from the stem of *Fraxinus ornus* and *F. rotundifolia*, obtained by incision. (B. P.) "The juice flowing from the incised bark" of "*Fraxinus rotundifolia* and *F. ornus*, hardened by the air." (Ph. L.) The finest variety of this drug is known as flake manna, and occurs in pieces varying from 1 to 6 inches long, 1 or 2 inches wide, and ½ to 1 inch thick. It has a yellowish-white or cream colour; an odour somewhat resembling honey, but less pleasant; a sweet, mawkish taste; and is light, porous, and friable. It is laxative in doses of 1 to ?

Manna, Factitious, made of a mixture of sugar, starch, and honey, with a very small quantity of scammony to give it odour and flavour, and to render it purgative, has been lately very extensively offered in trade, and met with a ready sale.

MAN'NACROUP. A granular preparation of wheat deprived of bran, used as an article of food for children and invalids. (Brande.)

MAN'NITE. $C_6H_{14}O_6$. *Syn.* MANNA SUGAR, MUSHROOM S.; MANNITA, L. A sweet, crystallizable substance, found in manna and in several other vegetable productions. It has been formed artificially by the action of sodium-amalgam upon an alkaline solution of cane sugar.

Prep. 1. Digest manna in boiling rectified spirit, and filter or decant the solution whilst hot; the mannite crystallizes as the liquid cools in tufts of slender, colourless needles.

2. (Ruspini.) Manna, 6 lbs.; cold water (in which the white of an egg has been beaten), 3 lbs.; mix, boil for a few minutes, and strain the syrup through linen whilst hot; the strained liquid will form a semi-crystalline mass on cooling; submit this to strong pressure in a cloth, mix the cake with its own weight of cold water, and again press it; dissolve the cake thus obtained in boiling water, add a little animal charcoal, and filter the mixture into a porcelain dish set over the fire; lastly, evaporate the filtrate to a pellicle, and set the syrup aside to crystallize. Large quadrangular prisms; perfectly white and transparent.

Prop., &c. Mannite has a powerfully sweet and agreeable taste; dissolves in 5 parts of cold water, and about half that quantity of boiling water; freely soluble in hot, and slightly so in cold alcohol; fuses by heat without loss of weight; with sulphuric acid it combines to form a new acid-compound. It is distinguished from the true sugars by its aqueous solution not being susceptible of the vinous fermentation, and not possessing the property of rotary polarization. When pure, it is perfectly destitute of purgative properties. It is now extensively imported from Italy, and is chiefly used to cover the taste of nauseous medicines, and as a sweetmeat.

MANURES'. Substances added to soils to increase their fertility. The food of vegetables, as far as their organic structure is concerned, consists entirely of inorganic compounds; and no organized body can serve for the nutrition of vegetables until it has been, by the process of decay, resolved into certain inorganic substances. These are carbonic acid, water, and ammonia, which are well known to be the final products of putrefaction. But even when these are applied to vegetables, their growth will not proceed unless certain mineral substances are likewise furnished in small quantities, either by the soil or the water used to moisten it. Almost every plant, when burned, leaves ashes, which commonly contain silica, potassa, and phosphate of lime; often, also, magnesia, soda, sulphates, and oxide of iron. These mineral bodies appear to be essential to the existence of the vegetable tissues; so that plants will not grow in soils destitute of them, however abundantly supplied with carbonic acid, ammonia, and water. The carbon of plants is wholly derived from carbonic acid, which is either absorbed from the atmosphere, and from rain water, by the leaves, or from the moisture and air in the soil, by the roots. Its carbon is retained and assimilated with the body of the plant, while its oxygen is given out in the gaseous form; this decomposition being always effected under the influence of light at ordinary temperatures. The hydrogen and oxygen of vegetables, which, when combined with carbon, constitute the ligneous, starchy, gummy, saccharine, oily, and resinous matters of plants, are derived from water chiefly absorbed by the roots from the soil. The nitrogen of vegetables is derived chiefly, if not exclusively, from ammonia, which is supplied to them in rain, and in manures, and which remains in the soil till absorbed by the roots.

According to the celebrated 'mineral theory' of agriculture, advanced by Liebig, a soil is fertile or barren for any given plant according as it contains those mineral substances that enter into its composition. Thus, "the ashes of wheat-straw contain much silica and potassa, whilst the ashes of the seeds contain phosphate of magnesia. Hence, if a soil is deficient in any one of these, it will not yield wheat. On the other hand, a good crop of wheat will exhaust the soil of these substances, and it will not yield a second crop till they have been restored, either by manure or by the gradual action of the weather in disintegrating the subsoil. Hence the benefit derived from fallows and from the rotation of crops.

"When, by an extraordinary supply of any one mineral ingredient, or of ammonia, a large crop has been obtained, it is not to be expected that a repetition of the same individual manure next year will produce the same effect. It must be remembered that the unusual crop has exhausted the soil probably of all the other mineral ingredients, and that they also must be restored before a second crop can be obtained.

"The salt most essential to the growth of the potato is the double phosphate of ammonia and magnesia; that chiefly required for hay is phosphate of lime; while for almost all plants potassa and ammonia are highly beneficial."

From these principles we "may deduce a few valuable conclusions in regard to the chemistry of agriculture. First, by examining the ashes of a thriving plant, we discover the mineral ingredients which must exist in a soil to render it fertile for that plant. Secondly, by examining a soil, we can say at once whether it is fertile in regard to any plants the ashes of which have been examined. Thirdly, when we know the defects of a soil, the deficient matters may be easily obtained and added to it, unmixed with such as are not required. Fourthly, the straw, leaves, &c., of any plant, are the best manure for that plant, since every vegetable extracts from the soil such matters alone as are essential to it. This important principle has been amply verified by the success attending the use of wheat-straw, or its ashes, as manure for wheat, and of the chippings of the vines as a manure for the vineyard. When these are used (in the proper quantity), no other manure is required. Fifthly, in the rotation of crops, those should be made to follow which require different materials; or a crop which extracts little or no mineral matter, such as peas, should come after one which exhausts the soil of its phosphates and potassa." (Liebig.)

The experiments of Messrs. Lawes and Gilbert have forced upon them opinions differing from those of Baron Liebig on some important points in relation to his 'mineral theory,' which endeavours to prove that "the crops on a field diminish or increase in exact proportion to the diminution or increase of the mineral substances conveyed to it in manure." The results obtained by the English investigators appear to prove that it is impossible to get good crops by using mineral manures alone, and that nitrogenous manures (farm-yard manure, guano, ammoniacal salts, &c.) are fertilizing agents of the highest order.

Of the chemical manures now so much used, bone-dust is, perhaps, the most important, as it supplies the phosphates which have been extracted by successive crops of grass and corn, the whole of the bones of the cattle fed on these crops having been derived from the soil; its gelatin also yields ammonia by putrefaction. Guano acts as a source of ammonia, containing much oxalate and urate of ammonia, with some phosphates. Nightsoil and urine, especially the latter, are most valuable for the ammonia they yield, as well as for phosphates and potassa; but are very much neglected in this country, although their importance is fully appreciated in Belgium, France, and China. Nitrate of soda is valued as a source of nitrogen.

All organic substances may be employed as manures; preference being, however, given to those abounding in nitrogen, and which readily decay when mixed with the soil.

The analysis of manures, soils, and the ashes of plants, for the purpose of ascertaining their composition and comparative value, is not easily performed by inexperienced parties; but a rough approximation to their contents, sufficiently accurate for all practical purposes, may be generally made by such persons with proper care and attention. See Agriculture, Bone-dust, Guano, &c.

Manures, Artificial. Various formulæ belonging to this head will be found dispersed, under their respective names, throughout this work. The following are additional ones:—

1. (Anderson.) Sulphate of ammonia, common salt, and oil of vitriol, of each, 10 parts; chloride of potassium, 15 parts; gypsum and sulphate of potassa, of each, 17 parts; saltpetre, 20 parts; crude Epsom salts, 25 parts; sulphate of soda, 33 parts. For clover.

2. (Huxtable.) Crude potash, 28 lbs.; common salt, 1 cwt.; bone-dust and gypsum, of each, 2 cwt.; wood-ashes, 15 bushels. For either corn, turnips, or grass.

3. (Johnstone.) Sulphate of soda (dry), 11 lbs.; wood-ashes, 28 lbs.; common salt, ¾ cwt.; crude sulphate of ammonia, 1 cwt.; bone-dust, 7 bushels. As a substitute for guano.

4. (Lawes' 'Superphosphate.') See Coprolite.

5. (Fertilizing powder.) A mixture of very fine bone-dust, 18 parts; calcined gypsum and sulphate of ammonia, of each, 1 part. The seed is ordered to be steeped in the 'drainings' from a dunghill, and after being drained, but whilst still wet, to be sprinkled with the powder, and then dried. See Flowers, Lime (Superphosphate), &c.

MAPS. These, as well as architect's and engineer's designs, plans, sections, drawings, &c., may be tinted with any of the simple liquid colours mentioned under 'Velvet colours,' preference being given to the most transparent ones, which will not obscure the lines beneath them. To prevent the colours from sinking and spreading, which they usually do on common paper, the latter should be wetted 2 or 3 times with a sponge dipped in alum water (3 or 4 oz. to the pint), or with a solution of white size, observing to dry it carefully after each coat. This tends to give lustre and beauty to the colours. The colours for this purpose should also be thickened with a little gum water. Before varnishing maps after colouring them, 2 or 3 coats of clean size should be applied with a soft brush—the first one to the back.

MARASCHI'NO (-kē′-no). *Syn.* Marasquin, Fr. A delicate liqueur spirit distilled from a peculiar cherry growing in Dalmatia, and afterwards sweetened with sugar. The best is from Zara, and is obtained from the marasca cherry only. An inferior quality is distilled from a mixture of cherries and the juice of liquorice root.

MAR'BLE. *Syn.* Limestone, Hard carbonate of Lime; Marmor, Calcis carbonas durus, M. album (B. P., Ph. E. & D.), L. Marbles are merely purer and more compact varieties of limestone, which admit of being sawn into slabs, and are susceptible of a fine polish. White marble is employed for the preparation of carbonic acid and some of the salts of lime. It contains about 65% of lime. Sp. gr. 2·70 to 2·85. The tests of its purity are the same as those already noticed under Chalk.

Marble is best cleaned with a little soap-and-water, to which some ox-gall may be added. Acids should be avoided. Oil and grease may be generally removed by spreading a paste made of soft soap, caustic potash lye, and fuller's earth, over the part, and allowing it to remain there for a few days; after which it must be washed off with clean water. Or, equal parts of American potash (crude carbonate of potash) and whiting are made into a moderately stiff paste with a sufficiency of boiling water, and applied to the marble with a brush. At the end of two or three days the paste is removed and the marble washed with soap and water. Any defect of polish may be brought up with tripoli, followed by putty powder, both being used along with water.

Marble is mended with one or other of the compounds noticed under CEMENTS.

Marble may be stained or dyed of various colours by applying coloured solutions or tinctures to the stone made sufficiently hot to make the liquid just simmer on the surface. The following are the substances usually employed for this purpose:—

BLUE. Tincture or solution of litmus, or an alkaline solution of indigo.

BROWN. Tincture of logwood.

CRIMSON. A solution of alkanet root in oil of turpentine.

FLESH COLOUR. Wax tinged with alkanet root, and applied to the marble hot enough to melt it freely.

GOLD COLOUR. A mixture of equal parts of white vitriol, sal ammoniac, and verdigris, each in fine powder, and carefully applied.

GREEN. An alkaline solution or tincture of sap green, or wax strongly coloured with verdigris; or the stone is first stained blue, and then the materials for yellow stain are applied.

RED. Tincture of dragon's blood, alkanet root, or cochineal.

YELLOW. Tincture of gamboge, turmeric, or saffron; or wax coloured with annotta. Success in the application of these colours requires considerable experience. By their skilful use, however, a very pleasing effect, both of colour and grain, may be produced.

MAR'BLING (of Books, &c.). The edges and covers of books are 'marbled' by laying the colour on them with a brush, or by means of a wooden trough containing mucilage, as follows:—Provide a wooden trough, 2 inches deep, 6 inches wide, and the length of a super-royal sheet; boil in a brass or copper pan any quantity of linseed and water until a thick mucilage is formed; strain this into the trough, and let it cool; then grind on a marble slab any of the following colours in table beer. For—blue, Prussian blue or indigo;—red, rose-pink, vermilion, or drop lake;—yellow, king's yellow, yellow ochre, &c.;—white, flake white;—black, ivory black, or burnt lamp-black;—brown umber, burnt u., terra di sienna, burnt s.; black, mixed with yellow or red, also makes brown;—green, blue and yellow mixed;—purple, red and blue mixed. For each colour provide two cups—one for the ground colours, the other to mix them with the ox-gall, which must be used to thin them at discretion. If too much gall is used, the colours spread; when they keep their place on the surface of the trough, on being moved with a quill, they are fit for use. All things being in readiness, the prepared colours are successively sprinkled on the surface of the mucilage in the trough with a brush, and are waved or drawn about with a quill or a stick, according to taste. When the design is thus formed, the book, tied tightly between cutting boards of the same size, is lightly pressed with its edge on the surface of the liquid pattern, and then withdrawn and dried. The covers may be marbled in the same way, only the liquid colours must be allowed to run over them. The film of colour in the trough may be as thin as possible; and if any remains after the marbling, it may be taken off by applying paper to it before you prepare for marbling again. This process has been called FRENCH MARBLING.

To diversify the effect, a little sweet oil is often mixed with the colours before sprinkling them on, by which means a light halo or circle appears round each spot. In like manner, spirit of turpentine, sprinkled on the surface of the trough, produces white spots. By staining the covers with any of the liquid dyes, and then dropping on them, or running over them, drops of the ordinary liquid mordants, a very pleasing effect may be produced. Vinegar black, or a solution of green copperas, thus applied to common leather, produces black spots or streaks, and gives a similar effect with most of the light dyes. A solution of alum or of tin in like manner produces bright spots or streaks, and soda or potash water dark ones. This style has been called EGYPTIAN MARBLE.—SOAP MARBLING is done by throwing on the colours, ground with a little white soap to a proper consistence, by means of a brush. It is much used for book-edges, stationery, sheets of paper, ladies' fancy work, &c.—THREAD MARBLE is given by first covering the edge uniformly of one colour, then laying pieces of thick thread irregularly on different parts of it, and giving it a fine dark sprinkle. When well managed, the effect is very pleasing.—RICE MARBLE is given in a similar way to the last by using rice.—TREE MARBLE is done on leather book-covers, &c., by bending the board a little in the centre, and running the marbling liquid over it in the form of vegetation. The knots are given by rubbing the end of a candle on those parts of the cover.—WAX MARBLE is given in a similar way to thread marble, but using melted wax, which is removed after the book is sprinkled and dried; or a sponge charged with blue, green, or red, may be passed over. This, also, is much used for stationery work, especially for folios and quartos. The 'vinegar black' of the bookbinders is merely a solution of acetate of iron, made by steeping a few rusty nails or some iron filings in vinegar. All the ordinary liquid colours that do not contain strong acids or alkalies may be used either alone or thickened with a little gum, for marbling or sprinkling books.

SPRINKLING is performed by simply dipping a stiff-haired painter's brush into the colour, and suddenly striking it against a small stick held in the left hand over the work. By this means the colour is evenly scattered without producing 'blurs' or 'blots.'

PAPER, PASTEBOARD, &c., in sheets, are marbled and sprinkled in a similar manner to that above described, but in this case the gum trough must, of course, be longer.

MARGAR'IC ACID. This term was formerly applied to a mixture of palmitic and stearic acids, produced by decomposing the alkaline soaps of solid fats with an acid, but it is now given to a fatty acid which can only be obtained artificially.

MAR'GARIN. *Syn.* MARGARATE OF GLYCERYLE. A constituent formerly supposed to exist in solid fats, but now regarded as a mixture of stearin and palmitin.

MARINE' ACID. See HYDROCHLORIC ACID.

MARL. A natural mixture of clay and chalk, with sand. It is characterised by effervescing with acids. According to the predominance of one or other of its component parts, it is called argillaceous, calcareous, or sandy marl. It is very generally employed as a manure for sandy soils, more particularly in Norfolk. See SOILS.

MAR'MALADE. Originally, a conserve made of quinces and sugar; now commonly applied to the conserves of other fruit, more especially to those of oranges and lemons.

Prep. Marmalades are made either by pounding the pulped fruit in a mortar with an equal or a rather larger quantity of powdered white sugar, or by mixing them together by heat, passing them through a hair sieve whilst hot, and then putting them into pots or glasses. The fruit-pulps are obtained by rubbing the fruit through a fine hair sieve, either at once or after it has been softened by simmering it for a short time along with a little water. When heat is employed in mixing the ingredients, the evaporation should be continued until the marmalade 'jellies' on cooling. See CONSERVES, CONFECTIONS, ELECTUARIES, JAMS, JELLIES, and *below*.

Marmalade, Apricot. From equal parts of pulp and sugar.

Marmalade, Mixed. From plums, pears, and apples, variously flavoured to palate.

Marmalade, Orange. *Prep.* 1. From oranges (either Seville or St. Michael's, or a mixture of the two), by boiling the peels in syrup until soft, then pulping them through a sieve, adding as much white sugar, and boiling them with the former syrup and the juice of the fruit to a proper consistence.

2. By melting the confection of orange peel (Ph. L.), either with or without the addition of some orange or lemon juice, and then passing it through a sieve.

3. (CANDIED ORANGE MARMALADE.) From candied orange peel, boiled in an equal weight each of sugar and water, and then passed through a sieve.

4. (SCOTCH MARMALADE.)—*a.* Seville orange juice, 1 quart; yellow peel of the fruit, grated; honey, 2 lbs.; boil to a proper consistence.

b. Seville oranges, 8 lbs.; peel them as thinly as possible, then squeeze out the juice, boil it on the yellow peels for ¼ hour, strain, add white sugar, 7 lbs., and boil to a proper consistence.

Marmalade, Quince. *Syn.* DIACYDONIUM. From quince flesh or pulp and sugar, equal parts; or from the juice (miva cydoniorum, gelatina c.), by boiling it to ½, adding an equal quantity of white wine and ⅔rds of its weight of sugar, and gently evaporating the mixture.

Marmalade, Tomato. Like APRICOT MARMALADE, adding a few slices of onions and a little parsley.

MARMORA'TUM. Finely powdered marble and quicklime, well beaten together; used as a cement or mortar.

MAR'ROW (Beef). This is extensively employed by the perfumers in the preparation of various pommades and other cosmetics, on account of its furnishing an exceedingly bland fat, which is not so much disposed to rancidity as the other fats. It is prepared for use by soaking and working it for some time in lukewarm water, and afterwards melting it in a water bath, and straining it through a piece of muslin whilst hot. When scented, it is esteemed equal to bear's grease for promoting the growth of the hair.

MARSH GAS. Light carbonetted hydrogen.

MARSH'S TEST. See ARSENIOUS ACID.

MARSH-MALLOW. *Syn.* ALTHÆA (Ph. L. & E.), L. The root (leaves and root—Ph. E. of *Althæa officinalis*, Linn., or common marsh-mallow. (Ph. L.) It is emollient and demulcent; the decoction is useful in irritation of the respiratory and urinary organs, and of the alimentary canal. The flowers as well as the root are reputed pectoral.

MARTIN'S POWDER. A mixture of white arsenic and the powdered stems of *Orobanche virginiana* (Linn.), a plant common in Virginia An American quack remedy for cancer.

MASS. *Syn.* MASSA, L. This term is commonly applied in pharmacy and veterinary medicine to certain preparations which are not made up into their ultimate form. Thus, we have 'ball-masses,' 'pill-masses,' &c.; of which, for convenience, large quantities are prepared at a time, and are kept in pots or jars, ready to be divided into balls or pills, as the demands of business may require. (See next page.)

MASSES (Veterinary).[1]

Massa Aloes. MASS OF ALOES. *Syn.* CATHARTIC MASS. *Prep.* Take of Barbadoes aloes, in small pieces, 8 parts; glycerin, 2 parts; ginger, in powder, 1 part; melt together in a water-bath, and thoroughly incorporate by frequent stirring.—*Use.* Cathartic for the horse.—*Dose.* From 6 to 8 drs.

Massa Aloes Composita. COMPOUND MASS OF ALOES. *Syn.* ALTERATIVE MASS. *Prep.* Take of Barbadoes aloes, in powder, 1 oz.; soft soap, 1 oz.; common mass, 6 oz.; thoroughly incorporate by beating in a mortar, so as to form a mass.—*Use.* Alterative for the horse.—*Dose.* 1 oz.

Massa Antimonii Tartarata Composita. COMPOUND MASS OF TARTARATED ANTIMONY. *Syn.* FEVER BALL. *Prep.* Take of tartarated antimony, in powder, ¼ dr.; camphor, in powder, ¼ dr.; nitrate of potash, in powder, 2 drs.; common mass, a sufficiency; mix so as to form a bolus.—*Use.* Febrifuge for the horse.—*Dose.* The above mixture constitutes 1 dose.

Massa Belladonnæ Composita. COMPOUND MASS OF BELLADONNA. *Syn.* COUGH BALL. *Prep.* Take of extract of belladonna, ½ to 1 dr.; Barbadoes aloes, in powder, 1 dr.; nitrate of potash, in powder, 2 drs.; common mass, a sufficiency; mix so as to form a bolus.—*Use.* For the horse in chronic cough.—*Dose.* The above mixture constitutes 1 dose.

Massa Catechu Composita. COMPOUND MASS OF CATECHU. *Syn.* ASTRINGENT MASS. *Prep.* Take of extract of catechu, in fine powder, 1 oz.; cinnamon bark, in fine powder, 1 oz.; common mass, 6 oz.; mix.—*Use.* Astringent for the horse.—*Dose.* 1 oz., in the form of bolus.

Massa Communis. COMMON MASS. *Prep.* Take of linseed, finely ground, and treacle, of each, equal parts; mix together so as to form a mass.—*Use.* An excipient for medicinal agents when they are to be administered in the form of bolus.

Massa Cupri Sulphatis. MASS OF SULPHATE OF COPPER. *Syn.* TONIC MASS. *Prep.* Take of sulphate of copper, finely powdered, 1 oz.; ginger, in powder, 1 oz.; common mass, 6 oz.; mix.—*Use.* Tonic for the horse.—*Dose.* 6 to 8 drs.

Massa Digitalis Composita. COMPOUND MASS OF DIGITALIS. *Syn.* COUGH BALL. *Prep.* Take of Barbadoes aloes, in powder, 2 oz.; digitalis, 1 oz.; common mass, 13 oz.; mix.—*Use.* For the horse in chronic cough.—*Dose.* 1 oz. once or twice a day.

Massa Ferri Sulphatis. MASS OF SULPHATE OF IRON. *Syn.* TONIC MASS. *Prep.* Take of sulphate of iron, in powder, 2 oz.; ginger, in powder, 1 oz.; common mass, 5 oz.; mix.—*Use.* Tonic for the horse.—*Dose.* 6 to 8 drs.

Massa Resinæ Composita. COMPOUND MASS OF RESIN. *Syn.* DIURETIC MASS. *Prep.* Take of resin, in powder, nitrate of potash, in powder, hard soap, of each, equal parts; mix.—*Use.* Diuretic for the horse.—*Dose.* 1 oz.

Massa Zingiberis Composita. COMPOUND MASS OF GINGER. *Syn.* CORDIAL MASS. *Prep.* Take of ginger, in powder, gentian root, in powder, treacle, of each, equal parts, a sufficiency; mix so as to form a mass.—*Use.* Stomachic for the horse.—*Dose.* 1 oz.

MAS'SICOT. *Syn.* MASTICOT, YELLOW PROTOXIDE OF LEAD; PLUMBI OXYDUM FLAVUM, CERUSSA CITRINA, L. The dross that forms on melted lead exposed to a current of air, roasted until it acquires a uniform yellow colour. Artists often apply the same name to white lead, roasted until it turns yellow. *Used* as a pigment.

MAS'TIC. *Syn.* MASTICH, GUM MASTIC; MASTICHE, L. The "resin flowing from the incised bark of *Pistacia Lentiscus*, var. *Chia.*" (Ph. L.) It occurs in pale yellowish, transparent, rounded tears, which soften between the teeth when chewed, and giving out a bitter, aromatic taste. Sp. gr. 1·07. It is soluble in both rectified spirit and oil of turpentine, forming varnishes. It is chiefly used as a 'masticatory,' to strengthen and preserve the teeth, and perfume the breath.

Mastic. Fine mortar or cement used for plastering walls, in which the ingredients, in a pulverulent state, are mixed up, either entirely or with a considerable portion of linseed oil. It sets very hard, and is ready to receive paint in a few days. See CEMENTS.

MASTICA'TION. The act of chewing food, by which it not only becomes comminuted, but mixed with the saliva, and reduced to a form fit for deglutition. It has been justly regarded by the highest authorities as the first process of digestion, and one without which the powers of the stomach are overtasked, and often performed with difficulty. Hence the prevalence of dyspepsia and bowelly complaints among persons with bad teeth, or who 'bolt' their food without chewing it.

MAS'TICATORIES. *Syn.* MASTICATORIA, L. Substances taking by chewing them. They are employed as intoxicants, cosmetics, and medicinals; generally with the first intention. The principal masticatory used in this country is tobacco. In Turkey, and several other Eastern nations, opium is taken in a similar manner. In India, a mixture of areca nut, betel leaf, and lime, performs the same duties; whilst in some other parts of the world preparations of the cacao are employed. As cosmetics, orris root, cassia, cinnamon, and sandal wood, are frequently chewed to scent the breath. Among medicinals, mastic and myrrh are frequently chewed to strengthen the teeth and gums; pellitory, to relieve the toothache; and rhubarb, ginger, and gentian, to relieve dyspepsia and promote the appetite.

Prep. 1. (Augustin.) Mastic, pellitory (both in powder), and white wax, of each, 1 dr.; mixed by heat and divided into 6 balls. In toothache, loose teeth, &c.

2. (W. Cooley.) Mastic, myrrh, and white wax, of each, 1 part; rhubarb, ginger, and

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[1] Reprinted from Tuson's 'Veterinary Pharmacopœia.'

extract of gentian, of each, 2 parts; beaten up with tincture of tolu, q. s., and divided into boluses or lozenges of 10 grs. each. One or two to be chewed an hour before dinner; in dyspepsia, defective appetite, &c.

3. (Quincy.) Mastic, 3 oz.; pellitory and stavesacre seed, of each, 2 drs.; cubebs and nutmegs, of each, 1 dr.; angelica root, ½ dr.; melted wax, q. s. to make it into small balls. As a stimulant to the gums, and in toothache.

4. Opium, ginger, rhubarb, mastic, pellitory of Spain, and orris root, of each, 1 dr.; melted spermaceti, q. s. to mix; for 6-gr. pills. As the last, and in toothache and painful gums.

MAS'TICOT. See MASSICOT.

MATCHES (Cooper's). *Syn.* SWEETENING MATCHES. These are made by dipping strips of coarse linen or canvas into melted brimstone. For use, the brimstone on one of them is set on fire, and the match is then at once suspended in the cask, and the bung loosely set in its place. After the lapse of 2 or 3 hours the match is removed, and the cask filled with liquor. Some persons pour a gallon or two of the liquor into the cask before 'matching' it. The object is to allay excessive fermentation. The operation is commonly adopted in the Western Counties for cider intended for shipment, or other long exposure during transport. It is also occasionally employed for inferior and 'doctored' wines.

MATCHES (Instantaneous Light). Of these there are several varieties, of which the one best known, and most extensively used, is the common phosphorus match, known as the 'congreve' or 'lucifer.'[1] We need not describe the 'chemical matches,' 'phosphorus bottles,' and 'prometheans,' in use during the early part of the present century, as these are quite obsolete. We will simply sketch the general process of manufacture now in use for phosphorus matches:

Manuf. The wooden splints are cut by steam machinery from the very best quality of pine planks, perfectly dried at a temperature of 400° Fahr. English splints are of two sizes—'large' and 'minnikins;' the former 2½ inches longer, and the latter somewhat shorter. In the manufacture double-lengths are used, so that each splint may be coated with the igniting composition at both ends, and then cut asunder in the middle to form two matches. In England the splints are usually cut square in form, but in Germany they are cylindrical, being prepared by forcing the wood through circular holes in a steel plate. The ends of the double splints having being slightly charred by contact with a red-hot plate, are coated with sulphur by dipping them to the requisite depth in the melted material. In some cases the ends are saturated with melted wax or paraffin instead of sulphur. The splints are then arranged in a frame between grooved boards in such a manner that the prepared ends project on each side of the frame. These projecting ends are then tipped with the phosphorus composition, which is spread to a uniform depth of about ¼ inch on a smooth slab of stone, kept warm by means of steam beneath. When partially dry, the tipped splints are taken from the frames, cut through the middle, and placed in heaps of 100, ready for 'boxing.'

The different compositions for tipping the matches in use in different countries and factories all consist essentially of emulsions of phosphorus in a solution of glue or gum, with or without other matters for increasing the combustibility, for colouring, &c. In England the composition contains a considerable quantity of chlorate of potassa, which imparts a snapping and flaming quality to the matches tipped with it, and but little phosphorus, on account of the moisture of the climate. In Germany the proportion of phosphorus used is much larger, and nitre, or some metallic peroxide, replaces chlorate of potassa. The German matches light quietly, with a mild lambent flame, and are injured quickly by damp. The following formulæ have been carefully selected:

1. (ENGLISH.) Fine glue, 2 parts, broken into small pieces, and soaked in water till quite soft, is added to water, 4 parts, and heated by means of a water bath until it is quite fluid, and at a temperature of 200° to 212° Fahr. The vessel is then removed from the fire, and phosphorus, 1½ to 2 parts, is gradually added, the mixture being agitated briskly and continually with a 'stirrer' having wooden pegs or bristles projecting at its lower end. When a uniform emulsion is obtained, chlorate of potassa, 4 to 5 parts, powdered glass, 3 to 4 parts, and red lead, smalt, or other colouring matter, a sufficient quantity (all in a state of very fine powder) are added, one at a time, to prevent accidents, and the stirring continued until the mixture is comparatively cool.

Obs. According to Mr. G. Gore, the above proportions are those of the best quality of English composition. The matches tipped with it deflagrate with a snapping noise. (See *above*.)

2. (GERMAN.)—*a.* (Böttger.) Dissolve gum arabic, 16 parts, in the least possible quantity of water, add of phosphorus (in powder), 9 parts, and mix by trituration; then add of nitre, 14 parts; vermilion or binoxide of manganese, 16 parts, and form the whole into a paste, as directed above; into this the matches are to be dipped, and then exposed to dry. As soon as the matches are quite dry, they are

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[1] The original 'LUCIFERS,' or 'LIGHT-BEARING MATCHES,' invented in 1826, consisted of strips of pasteboard, or flat splints of wood, tipped first with sulphur, and then with a mixture of sulphide of antimony and chlorate of potassa, and were ignited by drawing them briskly through folded glass-paper. They required a considerable effort to ignite them, and the composition was apt to be torn off by the violence of the friction. The term 'lucifer' having become familiar, was applied to the simpler and more effective match afterwards introduced under the names of 'CONGREVE' and 'CONGREVE LIGHT.'

to be dipped into very dilute copal varnish or lac varnish, and again exposed to dry, by which means they are rendered waterproof, or at least less likely to suffer from exposure in damp weather.

b. (Böttger.) Glue, 6 parts, is soaked in a little cold water for 24 hours, after which it is liquefied by trituration in a heated mortar; phosphorus, 4 parts, is now added, and rubbed down at a heat not exceeding 150° Fahr.; nitre (in fine powder), 10 parts, is next mixed in, and afterwards red ochre, 5 parts, and smalt, 2 parts, are further added, and the whole formed into a uniform paste, into which the matches are dipped, as before. Cheaper than the last.

c. (Diesel.) Phosphorus, 17 parts; glue, 21 parts; red lead, 24 parts; nitre, 38 parts. Proceed as above.

Obs. Matches tipped with the above (*a*, *b*, and *c*) inflame without fulmination when rubbed against a rough surface, and are hence termed 'noiseless matches' by the makers.

3. (Safety matches.) The latest improvement of note in the manufacture of matches is that of Landstrom, of Jonkoping, in Sweden, adopted by Messrs. Bryant and May (Patent). It consists in dividing the ingredient of the match-mixture into two separate compositions, one being placed on the ends of the splints, as usual, and the other, which contains the phosphorus, being spread in a thin layer upon the end or lid of the box. The following are the compositions used by the patentee:—*a.* (For the splints.) Chlorate of potassa, 6 parts; sulphuret of antimony, 2 to 3 parts; glue, 1 part. —*b.* (For the friction surface.) Amorphous phosphorus, 10 parts; sulphuret of antimony or peroxide of manganese, 8 parts; glue, 3 to 6 parts; spread thinly upon the surface, which has been previously made rough by a coating of glue and sand.

Obs. By thus dividing the composition, the danger of fires arising from ignition of the matches by accidental friction is avoided, as neither the portion on the splint nor that on the box can be ignited by rubbing against an unprepared surface. Again, by using the innocuous red or amorphous phosphorus, the danger of poisoning is entirely prevented.

MATE''RIA MED'ICA. A collective name of the various substances, natural and artificial, employed as medicines or in the cure of disease. In its more extended sense it includes the science which treats of their properties, classification, and applications. The *materia medica of the Pharmacopœia* is a mere list, with occasional notes, "embracing the animal, vegetable, and chemical substances, whether existing naturally, prepared in officinal chemical preparations, or sold in wholesale trade, which we (the College), direct to be used either in curing diseases or in preparing medicines." (Ph. L.)

MAT'ICO. *Syn.* Soldier's herb; Mateco (B.P., Ph. D.); Matica, Herba maticæ, L. The dried leaves of a Peruvian plant, generally believed to be the *Artanthe elongata*, one of the *Piperaceæ*. The leaves have been employed with considerable success as a mechanical external styptic; applied to leech-bites, slight cuts, and other wounds, &c., and pressed on with the fingers, they seldom fail to arrest the bleeding. Matico has also been much lauded as an internal astringent and styptic, in hæmorrhages from the lungs, stomach, bowels, uterus, &c.; but as it is nearly destitute of astringent properties, its virtues in these cases must have been inferred from its external action. As an aromatic, bitter stimulant, closely resembling the peppers, it has been proposed as a substitute for cubebs and black pepper, in the treatment of diseases of the mucous membranes, piles, &c.—*Dose.* ½ to 2 drs.; in powder; or under the form of infusion, tincture, or boluses.

MATURA'TION. Growing ripe. Amongst surgeons, this term is applied to the process of suppuration, or that which succeeds inflammation, and by which pus or matter is collected in an abscess. Warmth, irritation, and a liberal diet, promote this change; cold, sedatives, and depletion, retard it. The maturation of fermented liquor is noticed under Brewing, Malt liquors, Wines, &c.

MEAD. *Syn.* Mellina, L. An old English liquor, made from the combs from which the honey has been drained, by boiling them in water, and fermenting the saccharine solution thus obtained. It is commonly confounded with metheglin. Some persons add 1 oz. of hops to each gallon; and, after fermentation, a little brandy. It is then called sack mead. See Metheglin.

MEAL. The substance of edible grain ground to powder, without being bolted or sifted. Barley meal and oat meal are the common substances of this class in England. In North America the term is commonly applied to ground Indian corn, whether bolted or not. (Goodrich.) The four resolvent meals of old pharmacy (*quatuor farinæ resolventes*) are those of barley, beans, linseed, and rye.

MEALS. The "periods of taking food, usually adopted, in conformity with convenience and the recurrence of hunger, are those which are best adapted to the purposes of health; namely, the morning meal, the midday meal, and the evening meal." "That these are the proper periods for meals is evident from the fact of their maintaining their place amid the changes which fashion is constantly introducing." "If we look at these periods in another point of view, we shall find an interval of four hours left between them for the act of digestion and subsequent rest of the stomach. Digestion will claim between two and three hours of the interval; the remaining hour is all that the stomach gets of rest, enough, perhaps, but not too much, nor to be justly infringed." (Eras. Wilson.)

MEA'SLES. *Syn.* Rubeola, Morbilli, L.

This very common disease is characterised by feverishness, chilliness, shivering, head-pains, swelling and inflammation of the eyes, defluxion of sharp tears, with painful sensibility to light, oppressive cough, difficulty of breathing, and sometimes vomiting or diarrhœa. These are followed about the fourth day by a crimson rash upon the skin, in irregular crescents or circles, and by small red points or spots, which are perceptible to the touch, and which, after four or five days, go off with desquamation of the cuticle. The fever, cough, &c., often continue for some time; and unless there have been some considerable evacuations, either by perspiration or vomiting, they frequently return with increased violence, and occasion great distress and danger.

Treat. When there are no urgent local symptoms, mild aperients, antimonial diaphoretics, and diluents, should be had recourse to; but when the inflammatory symptoms are emergent, and the lungs are weak, especially in plethoric habits, blood may be taken. The cough may be relieved by expectorants, demulcents, and small doses of opium; and the diarrhœa by the administration of the compound powder of chalk and opium; the looseness of the bowels, however, had better not be interfered with, unless it be extreme.

Measles are most prevalent in the middle of winter, and though common to individuals of all ages, are most frequent amongst children. The plethoric, and those of a scrofulous habit, or one which has a syphilitic taint, suffer most from them.

Like the smallpox, the measles are contagious, and seldom attack the same person more than once during life. See Rash.

MEASURE. *Syn.* Mensura, L. The unit or standard by which we estimate extension, whether of length, superficies, or volume. The following tables represent the values and proportions of the principal measures employed in commerce and the arts:—

Table I. *English Lineal Measures.*

Inches.	Feet.	Yards.	Poles.	Furlongs.	Miles.
1·	·083	·028	·00505	·00012626	·0000157828
12·	1·	·333	·06060	·00151515	·00018939
36·	3·	1·	·1818	·004545	·00056818
198·	16·5	5·5	1·	·025	·003125
7920·	660·	220·	40·	1·	·125
63360·	5280·	1760·	320·	8·	1·

⁂ The unit of the above table is the yard, of which no legal standard has existed since that established by the statute of 1824 was destroyed by the fire which consumed the two Houses of Parliament, in 1834.

Table II. *English Measures of Superficies.*

Square Feet.	Square Yards.	Poles.	Roods.	Acres.
1·	·1111	·00367309	·000091827	·000022957
9·	1·	·0330579	·000826448	·000206612
272·25	30·25	1·	·025	·00625
10890·	1210·	40·	1·	·25
43560·	4840·	160·	4·	1·

Table III. *English Measure of Volume.—The* Imperial Standard, *and the relative value of its divisions, including those used in Medicine, with their* equivalents *in avoirdupois and troy weight.*

♏ Minims or drops.	f℥ Fluid Drachms.	f℥ Fluid Ounces.	O. Pints.	Oij. Quarts.	C. Gallons.	Pecks.	Bushels.	Quarters.	Equivalents in *distilled water*, at 62° Fahr., in Troy grains.	Avoird. weight.	
1·	·01666666	·00208333	·00010416	·00005208	·00001302	—	—	—	·91146		
60·	1·	·125	·00625	·003125	·00078125	—	—	—	54·6875	lb.	oz.
480·	8·	1·	·05	·025	·00625	—	—	—	437·5		1
9600·	160·	20·	1·	·5	·125	·0625	·015625	001953125	8750·	1	4
19200·	320·	40·	2·	1·	·25	·125	·03125	·00390625	17500·	2	8
76800·	1280·	160·	8·	4·	1·	·5	·125	·015625	70000·	10	
	2560·	320·	16·	8·	2·	1·	·25	·03125	—	20	
		1280·	64·	32·	8·	4·	1·	·125	—	80	
			512·	256·	64·	32·	8·	1·	—	640	

⁂ The standard unit of the above table is the gallon, which is declared, by statute, to be capable of "containing ten pounds avoirdupois weight of distilled water, weighed in the air at the temperature of 62° Fahr., the barometer being at 30 inches." The pound avoirdupois contains 7000 grains, and it is declared that a cubic inch of distilled water, under the above conditions, weighs 252·458 grains; hence the capacity of the imperial gallon and its divisions are as follows:—

Imperial gallon = 277·274 cubic inches.
„ quarts = 69·3185 „
„ pint = 34·65925 „
Fluid ounce = 1·73296 „
„ drachm = ·21662 „

†‡† The imperial gallon is 1-5th larger than the old wine gallon,—1-60th smaller than the old beer gallon, and—1-32nd larger than the old dry-measure gallon.

Table IV. *French Metrical or Decimal Measures of Length.*

Names.	Eq. in Mètres.	Equivalents in English Inches, at 32° Fahr.	English Long Measure, at 62° Fahr. Miles.	Fur.	Yds.	Feet.	Inch.
Millimètre . . .	·001	. . ·03937					
Centimètre . . .	·01	. . ·39371					
Décimètre . . .	·1	. . 3·93708					
Mètre	1·	. . 39·37079			1	0	3·37
Decamètre . . .	10·	. . 393·70790			10	2	9·7
Hectomètre . . .	100·	. . 3937·07900			109	1	1·078
Kilomètre . . .	1000·	. . 39370·79000		4	213	1	10·3
Myriamètre . . .	10000·	. 393707·90000	6	1	156	0	9·17

⁂ The standard unit of the above table is the mètre, which has been determined to be 39·37079 inches, at 32° Fahr. (Capt. Kater); the English foot is taken at 62° Fahr. The true length of the mètre, reduced to the latter temperature, is 39·370091 English inches; a number which varies from that in the table only at the fourth decimal figure. It will be perceived that the principle of nomenclature adopted in applying the names, was to prefix the Greek numerals to the decimal multiples, and the Latin numerals to the decimal subdivisions.

TABLE V. *French Metrical or Decimal Measures of Volume.*

Names.	Eq. in Litres.	Eq. in English Cubic Inches.	Equivalent in English Measures.				
			Gall.	*Pints.*	*Oz.*	*Dr.*	*Minims.*
Millilitre	·001	. . ·0610					16·9
Centilitre	·01	. . ·6103				2	49·
Decilitre	·1	. . 6·1028			3	4	10·36
Litre	1·	. . 61·028		1	15	1	43·69
Decalitre	10·	. . 610·28	2	1	12	1	16·9
Hectolitre	100·	. . 6102·8	22	0	1	4	49·
Kilolitre	1000·	. . 61028·	220	0	16	6	40·
Myrialitre	10000·	. . 610280·	2201 (≐ 275⅛ *bushels*).				

*** The standard unit in the above table is the litre, or the cube of the $\frac{1}{10}$ of a mètre. The French centiare contains 1 square mètre,—the are, 100 do.,—the hectare, 10,000 do. The old Paris pint is equal to 1·678 English imperial pint.

†‡† The capacity of solids and aëriform fluids is taken in cubic inches, or feet, in England. In France, the stere, or mètre cube, equal to 35·31658 English cube feet, is the standard unit.

TABLE VI. *Miscellaneous Measures, and their Equivalents:*

Tea or coffee spoonful . . . . (average)	=	1 fl. dr.
Dessert „ . . . . . „	=	2 „
Table „ . . . . . . „	=	4 „
Wine-glassful . . . . „	=	2 fl. oz.
Tea-cupful . . . . „	=	5 „
Breakfast-cupful . . . . . . „	=	8 „
Tumblerful . . . . „	=	8 „
Basinful . . . . „	=	12 „
Thimbleful . . . . „	=	¾ fl. dr.
Pinch (of leaves and flowers) . . . „	=	1 dr.
Handful „ „ . . . . „	≐	10 „
Cubic inch of water, at 62° Fahr.	=	252·458 gr.
„ foot „ „	=	62·32106 lb.
Line	=	$\frac{1}{12}$ inch.
Barleycorn	=	$\frac{1}{3}$ „
Hand	=	4 „
Chain	=	4 poles or 22 yards.

MEAT BIS'CUITS. *Prep.* 1. The flour is mixed up with a rich fluid extract of meat, and the dough is cut into pieces and baked in the usual manner.

2. Wheaten flour (or preferably the whole meal), 3 parts; fresh lean beef or other flesh (minced and pulped), 2 parts; thoroughly incorporate the two by hand-kneading or machinery, and bake the pieces in a moderately heated oven. Both the above are very nutritious; the last, more especially so. 1 oz. makes a pint of good soup.

MEAT EXTRACTS. Some preparations of this nature have been already noticed under the heads ESSENCE and EXTRACT; the following are additional and highly valuable formulæ:—

Prep. 1. (Dr. Breslau.) Young ox-flesh (free from fat) is minced small, and well beaten in a marble mortar, at first alone, and afterwards with a little cold or lukewarm water; the whole is then submitted to the action of a press, and the solid residuum is treated in the same manner, with a little more cold water; the juice (reddish in colour) is now heated to coagulate the albumen, strained, and finally evaporated in a water bath to the consistence of an extract. As ordinary flesh contains only 1% of kreatine, while that of the heart, according to Dr. Gregory, contains from 1·37% to 1·41%, this is the part employed by Dr. Breslau. The product possesses an agreeable odour and taste; and is easily soluble in water.

2. (Falkland.) Fresh lean beef (or other flesh), recently killed, is minced very fine, and digested, with agitation, in cold water, 1 pint, to which hydrochloric acid, 6 drops, and common salt, 1 dr., have been added; after about an hour, the whole is thrown upon a fine hair sieve, and the liquid portion allowed to drain off without pressure, the first portions that pass through being returned until the fluid, at first turbid, becomes quite clear and trans-

parent; when all the liquid has passed through, cold water, $\frac{1}{4}$ pint, is gently poured on, in small portions at a time, and allowed to drain through into that previously collected. The product is about $\frac{3}{4}$ pint of cold extract of flesh, having a red colour, and a pleasant, soup-like taste. It is administered cold to the invalid—a teacupful at a time, and must on no account be warmed, as the application of even a very slight heat causes its decomposition and the separation of a solid mass of coagulated albumen. This cold exract of flesh is not only much more nutritious than ordinary beef tea, but also contains a certain quantity of the red colouring matter of blood, in which there is a much larger proportion of the iron requisite for the formation of blood-particles. The hydrochloric acid also greatly facilitates the process of digestion. This formula is a modification of the one recently recommended by Liebig for the preparation of a highly nutritive and restorative food for invalids.

3. (Extractum Sanguinis bovis—Dr. Mauthner.) Pass fresh blood (caught from the slaughtered animal) through a sieve, evaporate it to dryness in a water bath, and when cold, rub it to powder.—*Dose.* 10 to 20 grs., or more, per diem, in a little water.

Obs. The above preparations are intended to supersede the inefficient compounds—beef tea, meat soups, &c., during sickness and convalescence. MM. Breslau and Mauthner describe their extracts of flesh and blood as being peculiarly advantageous in scrofulous exhaustion, exhaustion from anæmia, diarrhœa, &c. The extract of Falkland or Liebig is represented as having been employed both in the hospitals and in private practice at Munich, with the most extraordinary success. It is said to be capable of assimilation with the least possible expenditure of the vital force.

Meat, Fluid. This preparation consists of lean meat, in which the albumen has been changed so as to be non-coagulable by heat, and the fibrin and gelatin from their normal insoluble condition to one admitting of their being dissolved in water.

In this soluble condition, the first stage effected in stomach digestion, the several bodies are known as peptones or albuminose, and the proportion of their simple constituents remains the same as in ordinary fibrin, albumen, and gelatin.

The alteration is effected by finely mincing meat and digesting it with peptone hydrochloric acid and water at a temperature of about 100° Fahr. until dissolved.

The solution is then filtered, the bitter principle, formed during the digestion, removed by the addition of a little pancreatic emulsion, and the liquor which has been neutralized by the addition of carbonate of soda, evaporated to a thick syrup or extractive consistence.

Fluid meat is the only preparation which entirely represents, and yields the amount of nourishment afforded by, lean meat; it differs altogether from beef tea and extracts of meat, as all of these contain only a small portion of the different constituents of meat. A patent has been granted to its inventor, Mr. Darby.

MEAT PRESERVING. "The Belgian *Musée de l'Industrie* notes the following methods of preserving meats as the most deserving of attention amongst those communicated to the French Academy of Sciences, and published in the *Comptes Rendus*. 1. M. Bundet's method, by which the meat is kept in water acidulated with carbolic acid in the proportion of 1 to 5 parts of acid per 1000 of water. A series of experiments proved that all kinds of meat could thus be kept fresh, for lengthened periods, without acquiring any ill taste or odour.

"The meat may be placed in barrels or air-tight tin cases, filled with acidulated water of the strength above specified and headed up; or the pieces may be packed in barrels or cases in alternate layers with charcoal, pounded small, and saturated with water containing $\frac{5}{1000}$ of carbolic acid. The charcoal serves as a vehicle for the antiseptic fluid, and as an absorbent of any gaseous matters given off by the meat. The latter should be wrapped in thin linen covers to prevent the charcoal working its way into the tissues.

"This method, it is suggested, might be employed in curing pork in place of 'salting,' or of the more lengthy and costly process of 'smoking;' and also for the preservation of poultry, game, butter, eggs, &c.

"2. In the case of South American meat M. Baudet proposes the use of large sacks of caoutchouc. The meat should be packed in them, with alternate layers of charcoal as above described, and each sack, when filled, should be hermetically closed by drawing another empty caoutchouc sack, cap-wise, over it. The caoutchouc, it is supposed, would fetch enough in the market—its low price notwithstanding—to cover expenses of packing and freight, and so permit the meat to be sold in Europe at a very small advance on cost price. If intended for use a second time, the empty bags should be steeped in boiling water for a few minutes, to remove any organic impurities adhering to them.

"3. M. Gorge's method, which is in use in La Plata, consists in washing and drying the meat, and afterwards steeping in successive waters containing hydrochloric acid and sulphite of soda, and then packing it in air-tight cases holding 1, 5, or 10 kilog. each. Meat thus treated requires to be soaked in warm water for about half an hour before use.

"4. M. Leon Soubeiran has recommended braying and drying, in the fashion adopted by the Chinese and Mongols, as described by M. Simon, French Consul in China, in a communication made by him to the *Société d'Acclimatation*. The *pemmican* of our Arctic voyagers and the *charqui* of South America are familiar examples of meat preserved by analogous processes. The late M. Payen, a distinguished member of the Academy, insisted upon the great perfection to which this system might be carried by the aid of hot-air stoves and suitable apparatus."

MECON'IC ACID. $H_3C_7HO_7$. *Syn.* ACIDUM MECONICUM, L. A peculiar acid, first obtained by Sertuerner from opium, in 1804.

Prep. Meconate of lime is suspended in warm water, and treated with hydrochloric acid. Impure meconic acid crystallizes on cooling, and may be purified by repeated treatment in the same way with hydrochloric acid. Its purity is ascertained by its leaving no residue when heated in a platinum or glass capsule.

Prop. Meconic acid forms beautiful pearly scales; possesses a sour astringent taste; is soluble in boiling water, and to a less extent in cold; it is also soluble in alcohol. With the acids it forms salts called 'meconates,' most of which are crystallizable. Meconate of lime is obtained by heating a solution of chloride of calcium with an infusion of opium made with cold water, and neutralised by powdered marble, and collecting the precipitate. Meconate of potassa is prepared by direct solution of the base in the impure acid obtained from meconate of lime till the liquor turns green, heat being applied, when the salt crystallizes out as the liquid cools; it may be purified by pressure and recrystallization.

Tests. Meconic acid is charactised by—1. Turning ferric salts red, and the red colour not being destroyed by the action of corrosive sublimate.—2. Precipitating a weak solution of ammonio-sulphate of copper green.—3. With acetate of lead, nitrate of silver, and chloride of barium, it gives white precipitates, which are soluble in nitric acid.—4. It is not reddened by chloride of gold.

MEC'ONIN. $C_{10}H_{10}O_4$. A white, crystalline, odourless, neutral substance, discovered by Conerbe in opium.

MECO'NIUM. See OPIUM.

MED'ICINES. However skilful the medical practitioner may be, and however judicious his treatment, both are interfered with, and their value more or less neutralized, if the remedies he orders are not administered precisely according to his instructions. "It is the duty of the attendant on the sick to follow implicitly the directions of the physician, as well in exactly complying with his orders as in doing nothing that she has not been ordered to do. At the same time, there are exceptions to this rule, in which a suspension of the remedy, or a deviation from the order of the physician, is not only allowable, but is absolutely required. Thus, from idiosyncracy or some other cause, the remedy in the doses ordered may have no effect, or may produce one widely different from that intended or expected. In such cases it is evident that a strict adherence to the direction of the physician would be productive of evil; but he should be immediately apprised of the circumstance." The common practice of neglecting to administer the doses of medicine at the prescribed time, or after prescribed intervals, and then, to compensate for the omission, giving the medicine more frequently or in larger doses, cannot be too severely censured, as destructive to the welfare of the patient and injurious to the credit of the physician.

For the purpose of disguising the taste of medicines, or lessening their nauseating properties, Dr. Pollio has recommended a means founded on the physiological fact that a strong impression on the nerves (whether of vision, hearing, or taste) renders that which follows less perceptible than under the usual circumstances. Instead, therefore, of applying to the mouth agreeable substances after swallowing nauseous medicines, we should prepare it beforehand, in order that the taste of the medicine may not be perceived. Aromatic substances, as orange or lemon peel,&c., chewed just before taking medicine, effectually prevent castor oil, &c., being tasted. In preparing the mouth for bitters, liquorice is the only sweet that should be used, the others creating a peculiarly disagreeable compound taste. We have noticed already the effect of oil of orange peel in correcting the nauseating qualities of copaiba. See DOSE and PRESCRIBING.

MEER'SCHAUM. *Syn.* ECUME DE MER, L. A native silicate of magnesia. It has a sp. gr. ranging between 2·6 to 3·4; is readily acted on by acids, and fuses before a powerful blowpipe into a white enamel. The finest qualities are found in Greece and Turkey. Its principal application is to the manufacture of tobacco-pipes. The Germans prepare their pipes for sale by soaking them in tallow, then in white max, and, finally, by polishing them with shavegrass. Genuine meerschaum pipes are distinguished from mock ones by the beautiful brown colour which they assume after being smoked for some time. Of late years some of the pipemakers have produced a composition clay pipe, which closely resembles meerschaum in appearance, and is "warranted to colour well." This composition, which is comparatively valueless, is made up into pipes of suitable patterns, which are frequently sold to the ignorant for 'meerschaums.'

ME'GRIM. *Syn.* MEAGRIM, HEMICRANIA, L. A pain affecting one side of the head only, often periodic, like an ague, and generally of a nervious, hysterical or bilious character. It is clavus when there is a strong pulsation, conveying the sensation of a nail piercing the part. See HEADACHE.

MEG'RIMS. *Syn.* MEAGRIMS, VERTIGO. In veterinary medicine this term is applied to horses which when at work reel, then stand for a minute dull and stupid, or fall to the ground, and lie partially insensible for a few minutes. "Horses subject to this affection should be driven with a breastplate or nine collar, so as to prevent pressure on carrying the blood from the head; the bowels should be kept in good order; an occasional laxative is advisable, and a course, either of arsenic or quinine, or of arsenic and iron." (Dun.)

MEL'ANCHOLY. See HYPOCHONDRIASIS and INSANITY.

MELIS'SIC ALCOHOL. A substance obtained by Brodie from bees' wax. By oxidation it yields 'melissic acid.'

MELLA'GO. The old name for a medicine having the consistence of honey, with a somewhat sweetish taste. Mellago taraxaci is fluid extract of dandelion.

MELTING-POINT. The temperature at which solids assume the liquid form.

MEN'STRUUM. [L.] A solvent or dissolvent. The principal MENSTRUA employed in chemistry and pharmacy to extract the active principles of bodies by digestion, decoction, infusion, or maceration, are water, alcohol, oils, and solutions of the acids and alkalies.

MERCU'RIAL BAL'SAM. See OINTMENT OF NITRATE OF MERCURY.

MERCU'RIAL DISEASE'. *Syn.* MORBUS MERCURIALIS, HYDRARGYRIASIS, L. This results from the injudicious or excessive use of mercury, or exposure to the fumes of this metal. The common and leading symptoms are a disagreeable coppery taste; excessive salivation; sponginess, tumefaction, and ulceration of the gums; swollen tongue; loosening of the teeth; exfoliation of the jaws; remarkably offensive breath; debility; emaciation; ending (when not arrested) in death from exhaustion. Fever, cachexia, violent purging and griping, a species of eczema (ECZEMA MERCURIALE, LEPRA MERCURIALIS), and other forms of skin disease, are also phases of the same affection, the first of which occasionally proves fatal under the influence of sudden and violent physical exertion.

The treatment, in ordinary cases, may consist in free exposure to the open air, avoiding either heat or cold; the administration of saline aperients, as Epsom salts, phosphate of soda, &c.; the free use of lemon juice and water as a common drink; with weak gargles or washes of chloride of soda or chloride of lime to the gums, mouth, and throat. Severe cases often resist every variety of treatment, and instances are recorded in the medical journals in which the use of even small doses of mercurials, administered by the faculty, have, owing to the peculiar idiosyncrasy of the patients, been followed by the most horrible sufferings, terminating in death.

MER'CURY. Hg. *Syn.* QUICKSILVER; HYDRARGYRUM, B. P., Ph. L. E. and D.; MERCURE, VIF ARGENT, Fr.; QUECKSILBER, Ger. A remarkable metal, which has been known from a very early period. The Romans employed it as a medicine externally, as did the Arabs; but the Hindoos were probably the first to prescribe it internally.

Sources. The most important are the mines of Idria, in Carniola; Almaden, in New Castile; and New Almaden, in California, where it exists combined with sulphur, under the form of cinnabar. From this ore the pure metal is obtained by distilling it with lime or iron filings, in iron retorts, by which the sulphur it contains is seized and retained, while the mercury rises in the state of vapour, and is condensed in suitable receivers. Quicksilver is commonly imported in cylindrical iron bottles, containing ¾ cwt. to 1 cwt. each. It is also imported in small quantities from China, contained in bamboo bottles holding about 20 lbs. each.

Prep. Mercury, as imported, is usually sufficiently pure for medicinal purposes without any further preparation. Mere mechanical impurities, as floating dust, dirt, &c., may be got rid of by squeezing the metal through chamois leather or flannel, or by filtering it through a small hole in the apex of an inverted cone of paper. It can be further cleaned by shaking well with a little strong nitric acid, washing with distilled water, and drying by blotting paper, or filtering through warm chamois leather.

Prop., &c. Mercury, at all common temperatures, is a heavy liquid, possessing a nearly silver-white colour, and a brilliant metallic lustre; solidifies (freezes) at —40° Fahr., and is then ductile, malleable, and tenacious; boils at 662° Fahr., and escapes in colourless transparent vapour, of great density; it also volatilises slowly at the ordinary temperature of the atmosphere. The presence of minute quantities of lead and zinc greatly retard its evaporation at its boiling heat. It unites with oxygen, chlorine, iodine, &c., forming numerous compounds. With the metals it unites to form AMALGAMS. The only acids which act directly on metallic mercury are the sulphuric and nitric, but for this purpose the former must be heated and concentrated. Nitric acid, however, even when dilute and in the cold, dissolves it freely. Pure mercury is unalterable in the air at ordinary temperatures. Sp. gr. 13·59 at 60° Fahr.; about 14 when in the solid state.

Uses, &c. Mercury is applied to various purposes in the arts; as the amalgamation of gold and silver, (wash gilding,) the silvering of looking-glasses, the manufacture of barometers and thermometers, and the preparation of several very valuable medicines. In its metallic state it appears to be inert when swallowed, unless it meets with much acidity in the alimentary canal, or is in a state of minute division; its compounds are, however, all of them more or less poisonous.

Mercury has been employed in one or other of its forms in almost all diseases; but each of its numerous preparations is supposed to have some peculiarity of action of its own, combined with that common to all the compounds of this metal. The mercurials form, indeed, one of the most important classes of the materia medica.

Tests. 1. *Metallic mercury* is detected by its liquid condition and volatility; and, when in a finely divided or pulverulent state, by the microscope, or by staining a piece of copper white when the two are rubbed together.

Mercury, when present in combination, can be detected as under:

When intimately mixed with anhydrous sodium carbonate, and heated in a small test-tube, under a layer of the carbonate, decomposition ensues, and a crust of gray sublimate forms on the cooler portion of the tube. When examined by a lens, this crust is seen to consist of minute metallic globules. By friction with a bright glass or iron rod, these are united into globules, which are visible to the naked eye.

A perfectly clean and bright piece of copper, immersed in a slightly acid solution of mercury, becomes in a short time covered with a gray or whitish stain, which assumes a silvery lustre when gently rubbed with a piece of soft cork or leather, and is removed by the subsequent application of heat. A single drop of liquid may be tested on bright copper coin in this way.

The plate of copper with the deposit of mercury, obtained as above, after being washed with a weak solution of ammonia, and in distilled water, and dried by pressure between the folds of bibulous paper, may be cut into small pieces, and heated in a test-tube, in order to obtain metallic globules. When the suspected solution contains organic matter, bright copper filings may be employed, and the process modified so as nearly to resemble Reinsch's test for arsenious acid. According to Orfila, "scraped copper plate" is capable of detecting the presence of $\frac{1}{800000}$th part of corrosive sublimate in a solution. MM. Trousseau and Reveil state that a plate of yellow copper (brass) is even more susceptible than one of red copper.

(Smithson's electrolytic test.) This consists in the use of a polished wire or plate of gold or copper round which a strip or thread of zinc or tin is wound in a spiral direction. The suspected liquid is acidulated with a few drops of hydrochloric acid, and after immersion for a longer or a shorter period (as half an hour to an hour or two), the gold will have become white if any mercury is present. The coil of zinc or tin is then removed from the gold, and the latter, after being washed and dried between the folds of bibulous paper, is heated in a test-tube, to obtain metallic globules, as before.

An ingenious extemporaneous application of the electrolytic test may be made as follows:—Place a drop or two of the suspected liquid on a clean and bright gold or copper coin, and apply a bright key, so that it may at once touch the edge of the coin and the solution. (See engr.) An electric current will then be established as before, and a white spot of reduced mercury will appear on the surface of the metal, which may be recognised in the manner already explained.

a. A gold or copper coin.
b. Drop of suspected solution.
c. A bright key.

The salts of mercury are divided into two classes—mercurous, where mercury is a monad element, and unites with one atom of chlorine, and mercuric salts, where it plays the art of a dyad element, or unites with two atoms. The latter of these will be taken first.

Mercuric Salts. *Tests.* Sulphuretted hydrogen and ammonium sulphide, added in very small quantities, produce on agitation a perfectly white precipitate, which acquires successively a yellow, orange, and brownish-red colour, as more of the test is added; and, ultimately, when the test is added in considerable excess, an intensely black colour. This precipitate is insoluble in excess of the precipitant, potassium hydrate, potassium cyanide, hydrochloric acid, or nitric acid, even when boiling; but it dissolves readily and completely in potassium sulphide and in 'aqua regia' with decomposition. These reactions are characteristic.

Ammonia gives a white precipitate.

Potassium hydrate gives a reddish precipitate, turning yellow when the test is added in excess. The presence of ammonia causes the precipitate to be white, and when the solution contains much acid both reactions are imperfect.

Alkaline carbonates give a brick-red precipitate.

Potassium iodide gives a scarlet precipitate, which is soluble in excess, and in alcohol, and solution of sodium chloride.

The alkaline bicarbonates either do not disturb the solution, or only cause a slight degree of opalescence.

Mercuric Acetate. $Hg(C_2H_3O_2)_2$. *Syn.* PROTACETATE OF MERCURY. *Prep.* By dissolving mercuric oxide in warm acetic acid. It crystallises in brilliant micaceous lamina, soluble in their own weight of cold water, and somewhat more soluble in boiling water. According to Robiquet, this is the basis of Keyser's antivenereal pills, which do not contain subacetate of mercury, as has been asserted.

Mercuric Bromide. $HgBr_2$. *Syn.* PROTOBROMIDE OF MERCURY, HYDRARGYRI BIBROMIDUM. *Prep.* Two equal parts of bromine and mercury and sublime. Soluble reddish mass; resembles the iodide in its action.—*Dose.* $\frac{1}{30}$ to ⅛ gr.

Mercuric Chloride. $HgCl_2$. *Syn.* PROTOCHLORIDE OF MERCURY, PERCHLORIDE OF MERCURY, BICHLORIDE OF MERCURY, CORROSIVE SUBLIMATE; HYDRARGYRI PERCHLORIDUM (B. P.), HYDRARGYRI BICHLORIDUM (Ph. L.), SUBLIMATUS CORROSIVUS (Ph. E.), SUBLIMATUM CORROSIVUM (Ph. D.), HYDRARGYRI CHLORIDUM CORROSIVUM (Ph. U. S.), HYDRARGYRI MURIAS CORROSIVUS, L. This is the 'corrosive sublimate' of the shops.

Prep. 1. (Ph. L.) Mercury, 2 lbs.; sulphuric acid, 21¼ fl. oz.; boil to dryness, and rub the residuum, when cold, with sodium chloride, 1½ lb., in an earthenware mortar; lastly, sublime by a gradually increased heat.

2. (Ph. E.) Mercury, 4 oz.; sulphuric acid 2 fl. oz. 3 fl. dr.; pure nitric acid, ½ fl. oz.; dissolve, add of sodium chloride 3 oz., and sublime, as before.

3. (Ph. D.) 'Persulphate of mercury' (mercuric sulphate), 2 parts; dried sodium chloride, 1 part; triturate, &c., as before.

Obs. In preparing corrosive sublimate, as well as calomel, by the common process, the solution of the mercury is usually made in an iron pot, set in a furnace under a chimney, to carry off the fumes; and the sublimation is conducted in an earthen alembic placed in a sand bath; or in an iron pot, covered with a semi-spherical earthen head. Corrosive sublimate may also be made by the direct solution of mercuric oxide in hydrochloric acid, or by bringing its constituents together in the state of vapour. The latter plan was patented by the late Dr. A. T. Thomson.

Prop. The mercuric chloride of commerce occurs in white, semi-transparent, crystalline masses, of considerable density; it possesses an intense coppery taste, is soluble in about 16 parts of cold, and in 3 parts of boiling water; the boiling solution deposits its excess of salt in long white prisms as it cools; soluble in alcohol and ether, in the latter so much so that it has even the property of withdrawing it from its aqueous solutions; the addition of hydrochloric acid, ammonious chloride or camphor, increases its solubility in all these menstrua. It is decomposed by contact with nearly all metallic bodies, and in solution by various organic substances, and by exposure to light. Sp. gr. 5·2 (5·14 to 5·42—Liebig). It melts at about 509° Fahr., and boils and volatilises at a higher temperature.

Tests. The presence of mercuric chloride may, under most circumstances, be readily detected by the tests given. To distinguish it from other salts, special tests for chlorine or hydrochloric acid must be applied. If, on filtering the solution, acidulating it with dilute nitric acid, and testing it with silver nitrate, a cloudy white precipitate be formed, which is insoluble in excess of the precipitant, and in nitric acid, but soluble in ammonia water, and blackened by lengthened exposure to light, corrosive sublimate is shown to be present in the substance examined. Calomel, the only compound of mercury with chlorine besides corrosive sublimate, is an insoluble powder, which could not, therefore, be found in the filtered liquid. Calomel, or the white precipitate formed by the mercurous salt, with hydrochloric acid and the soluble chlorides, is soluble in excess of the precipitant, and is not only insoluble in liquor of ammonia, but is immediately blackened by it.

For the purpose of demonstrating the presence of corrosive sublimate in a highly coloured liquid, or one loaded with organic matter, it is necessary to agitate it for some minutes with an equal volume of ether. After repose for a short time, the ethereal solution is decanted, and allowed to evaporate spontaneously. The residuum (if any) contains the corrosive sublimate, which, after being dissolved in distilled water, is readily recognised by the above characteristics.

When the substance under examination consists of food, or the contents of the digestive canal, or of animal tissue, it is in general necessary to destroy the organic matter in a nearly similar way to that described under ARSENIOUS ACID. The process adopted by Devergie for this purpose consists in dissolving the substance in concentrated hydrochloric acid, and passing a stream of chlorine through the liquid.—Flandin first carbonizes the mass with ⅓ or ¼ its weight of concentrated sulphuric acid, at 212° Fahr., and then saturates the acid in the cold, with dry 'chloride of lime,' added in fragments, assisting the action by stirring, and further adding, by degrees, as the matter thickens and becomes white, a sufficient quantity of distilled water.—Lassaigne boils the suspected mixture for some time with a solution of sodium chloride; a method which, according to Orfila, is not sufficiently delicate to withdraw minute portions of mercury from flesh.—Millon agitates organic liquids (more especially blood, milk, &c.) in large flasks containing gaseous chlorine, which is frequently renewed.—Orfila either dissolves the matter in aqua regia, and passes a stream of chlorine through the liquid, or he carbonizes it by means of concentrated sulphuric acid, in close vessels.—Personne proceeds by a similar method, but avoids raising the temperature of the substances operated on.—Reveil employs either the last method or that of Millon. In all cases it is advisable to operate in close vessels, on account of the volatility of the bichloride. Orfila's apparatus consists of a matrass, provided with a bent tube, the one end of which is plunged into a jar of cold distilled water. The corrosive sublimate is found both in the volatilized matter and in the carbonized residuum, and is extracted from the latter by boiling it for 15 or 20 minutes in aqua regia.

When the organic matter has been destroyed by any of the above processes, and a colourless and filtered solution in distilled water obtained, the usual tests may be at once applied. But in this way we can only detect the presence of mercury, but are unable to decide in what way it has entered the system, although we may infer it from other circumstances. It is, therefore, absolutely necessary, in all medico-legal investigations, to previously employ ether (see *above*), in order that we may be enabled to examine the deleterious matter in its original form, or that in which it was swallowed.

Uses, &c. Mercuric chloride is employed as an alterative, diaphoretic, and resolvent, in the chronic forms of secondary syphilis, rheumatism, scrofula, cancer, old dropsies, numerous skin diseases, &c.; and externally, as a caustic, in cancer, and made into an ointment, lotion, or injection, in a vast number of skin diseases, ulcers, gleet, &c., and as a preventive of contagion. It acts quicker than the other preparations of mercury, and it is less apt to induce salivation; but it has been said that its effects are less apparent.—*Dose.* $\frac{1}{16}$ to $\frac{1}{4}$ gr., either made into a pill, or in solution. It is highly poisonous, and must be exhibited and handled with the greatest caution. Its use is contra-indicated in cases complicated with pulmonary affections or nervous derangement.

Pois.—1. *Symptoms.* Strong coppery or metallic taste; intense pain in the mouth, pharynx, œsophagus, stomach, and intestines; nausea, vomiting (often bloody), diarrhœa, and (sometimes) violent dysentery (these evacuations are generally more frequent than in poisoning by other metallic compounds). After a certain time there is generally an abatement of the severity of the symptoms; the circulation becomes slower, the pulse small and thready, the respiration gentle, and the skin cold; syncope then supervenes, and great general insensibility, always commencing at the pelvic extremities; and sometimes convulsions occur; the secretion of urine is generally diminished, sometimes even entirely suppressed; but the patients always urinate if the sublimate has been employed in a very diluted state, and if drinks have been administered. Death often appears to result from the shock to the nervous system, from intense exhaustion, or from mortification or intense inflammation of the primæ viæ. Poisoning by corrosive sublimate is distinguished from that by arsenic, by the countenance being flushed, and even swollen; whereas, in poisoning by arsenic, it is usually contracted and ghastly, and by the whitened condition of the epithelium of the mouth.

2. *Antidotes.* White of egg, hydrated ferric sulphide or ferrous sulphide, and gluten, are each of them powerful antidotes. White of egg has proved efficacious in numerous cases. It requires the white of one egg to decompose 4 grs. of corrosive sublimate. (Peschier.) The recently precipitated protosulphuret of iron is, however, according to Mialhe, the antidote par excellence, not only to corrosive sublimate, but to the salts of lead and copper. The gluten of wheat has also been recommended (Taddei); or, what is equally efficacious, wheat flour mixed up with water. When any of the above are not at hand, copious draughts of milk may be substituted. Iron filings have been occasionally used as an antidote. All these substances should be taken in considerable quantities; the dose should be frequently repeated, and the general treatment similar to that in cases of poisoning by arsenic. Vomiting should be, in all cases, immediately induced, to remove, if possible, the poisonous matter from the stomach.

Mercuric-ammonium Chloride. $HgNH_2Cl$. *Syn.* AMMONIO-CHLORIDE OF MERCURY, AMMONIATED CHLORIDE OF MERCURY, WHITE PRECIPITATE, LEMERY'S W. P., COSMETIC MERCURY; HYDRARGYRI AMMONIATUM (B. P.), HYDRARGYRI AMMONIO-CHLORIDUM (Ph. L.), HYDRARGYRUM PRÆCIPITATUM ALBUM (Ph. E.).

Prep. 1. (Ph. L.) Mercuric chloride, 6 oz.; distilled water, 3 quarts; dissolve, with heat, and when the solution has cooled, add of liquor of ammonia, 8 fl. oz., frequently shaking it; lastly, wash the precipitate with water, and dry it. The formulæ of the Ph. E. & D. are nearly similar.

2. Mercuric chloride and ammonium chloride, of each, $\frac{1}{2}$ lb.; water, 3 quarts; dissolve, and precipitate with solution of potassium hydrate, q. s.

Prop., &c. A white, inodorous, light mass, or powder; insoluble in alcohol, partially soluble in boiling water, and wholly dissolved by sulphuric, nitric, and hydrochloric acids, without effervescence. It is totally dissipated by heat. When heated with solution of potash, it exhales ammonia, and assumes a yellow colour. Used to make an ointment, which is employed in herpes, porrigo, itch, and other skin diseases, &c.; and by the lower orders, as a dusting powder to destroy pediculi, an application which, from its liberal employment, is not always a safe one. It is highly poisonous, and must not be swallowed.

Mercuric and Ammonium Chloride. $NH_4Cl,HgCl_2$. *Syn.* CHLORIDE OF MERCURY AND AMMONIUM, SAL ALEMBROTH; HYDRARGYRI ET AMMONII CHLORIDUM, L. *Prep.* (P. Cod.) From mercuric chloride and ammonium chloride, equal parts, triturated together. "The object in adding the ammonium chloride here is to render the corrosive sublimate more soluble in water. The action of the latter is not otherwise altered." (Redwood.) It is chiefly used for lotions and injections.

Mercuric and Quinine Chloride. *Syn.* CHLORIDE OF MERCURY AND QUININE; HYDRARGYRI ET QUINÆ CHLORIDUM, L. *Prep.* (M'Dermott.) From mercuric chloride, 1 part; quinine chloride, 3 parts; separately formed into saturated solutions with water and then mixed; the crystalline precipitate is collected, and dried by a gentle heat.—*Dose.* ¼ to ½ gr., made into a pill with crum of bread; daily, as an alterative in debilitated habits; or combined with opium, thrice daily, to produce salivation.

Mercuric Cyanide. $HgCy_2$ or $Hg(CN)_2$. *Syn.* CYANIDE OF MERCURY; HYDRARGYRI CYANIDUM, H. BICYANIDUM, H. CYANURETUM (Ph. U. S.), L.

Prep. 1. (Ph. L. 1836.) Ferric ferrocyanide (pure Prussian blue), 8 oz.; mercuric oxide, 10 oz.; distilled water, 4 pints; boil for half an hour, filter, evaporate, and crystallize; wash what remains frequently with boiling distilled water, and again evaporate, that crystals may form. This is Proust's process. The formula of the Ph. U. S. is similar.

2. (Ph. D. 1826.) Prussian blue (pure), 6 parts; mercuric oxide, 5 parts; distilled water, 40 parts; as the last.

3. (Desfosses.) Potassium ferrocyanide, 1 part, is boiled for ½ hour with mercuric sulphate, 2 parts, and distilled water, 8 parts; the deposit is separated by filtration, and the liquid evaporated to the crystallising-point.

4. (Winckler.) Saturate dilute hydrocyanic acid with mercuric oxide; evaporate and crystallise. Pure.

Prop., &c. Heavy, colourless, inodorous, square prisms; tasting strongly metallic; soluble in 8 parts of cold water; slightly soluble in alcohol. Those made by the first two formulæ are of a pale yellow colour. It is transparent and totally soluble in water. The solution, on the addition of hydrochloric acid, evolves hydrocyanic acid, known by its smell; and a glass moistened with a solution of nitrate of silver, and held over it, gives a deposit soluble in boiling nitric acid. When heated, it evolves cyanogen, and runs into globules of metallic mercury. It has been administered in some hepatic and skin diseases, and has been proposed as a substitute for corrosive sublimate. (Parent.) It has been said to act directly on the skin and bones, and to have proved useful in allaying the pain of nodes and in dispersing them. (Mendaga.) It is, however, principally used as a source of cyanogen and hydrocyanic acid.—*Dose.* 1/16 to ¼ gr. (beginning with the smaller quantity), made into pills with crum of bread, or in alcoholic solution; as a gargle or lotion, 10 grs., to water, 1 pint; as an ointment, 10 or 12 grs., to lard, 1 oz.

Mercuric Iodide. HgI_2. *Syn.* PROTIODIDE OF MERCURY, RED IODIDE OF MERCURY, IODIDE OF MERCURY, BINIODIDE OF MERCURY; HYDRARGYRI IODIDUM RUBRUM (B. P.), HYDRARGYRI IODIDUM, H. BINIODIDUM (Ph. E.), H. IODIDUM RUBRUM (Ph. D.), L. *Prep.* 1. (B. P.) Mercuric chloride (corrosive sublimate), 4; potassium iodide, 5; boiling distilled water, 80. Dissolve the mercuric chloride in 60 of water, and the potassium iodide in the remainder, and mix the two solutions. Allow to stand, decant the supernatant liquor, and collect the precipitate in a filter, wash twice with cold water, and dry at 212° F.

2. (Ph. L. 1836.) Mercury, 1 oz.; iodine, 10 drs.; rectified spirit, q. s. (2 or 3 fl. drs.); triturate until the globules of mercury disappear, and the mixture assumes a scarlet colour, then dry it in the shade, and preserve it in a well-stoppered vessel.

3. (Ph. E.) Mercury, 2 oz.; iodine, 2½ oz.; spirit, q. s.; triturate together as last, dissolve the product, by brisk ebullition, in concentrated solution of sodium chloride, 1 gal., filter whilst boiling hot, wash the crystals that are deposited as the solution cools, and dry them.

4. (Ph. D.) Mercuric chloride, 1 oz.; hot distilled water, 25 fl. oz.; dissolve potassium iodide, 1¼ oz.; water, 5 fl. oz.; dissolve; when the solutions are cold, mix them, collect the precipitate on a paper filter, drain it, wash it with distilled water, 10 fl. oz., and dry it at a heat not above that of boiling water.

Prop., &c. A bright scarlet powder, insoluble in water, but soluble in alcohol and ether, and in the solutions of several of the iodides and chlorides. It is also soluble in cod-liver oil, and in several other fixed oils. Readily sublimed.—*Dose.* 1/16 to ¼ gr., dissolved in alcohol or made into a pill; in the same cases as the subiodides, from which it differs chiefly in its greater energy and poisonous qualities.

Mercuric and Potassium Iodide. $HgI_2 . KI$. *Syn.* IODIDE OF MERCURY AND POTASSIUM, IODO-HYDRARGYRATE OF POTASSIUM; HYDRARGYRI ET POTASSII IODIDUM, L. *Prep.* 1. (M. Boullay.) Mercuric iodide, potassium iodide, and water, equal parts; dissolve by heat, and crystallise by evaporation or refrigeration, or gently evaporate to dryness.

2. (Puche.) From mercuric iodide and potassium iodide, equal parts, triturated together.—*Dose.* 1/16 to ⅛ gr., dissolved in water; in the same cases as the biniodide, and in chronic bronchitis, hooping-cough, inflammatory sore throat, &c.

Mercuric and Potassium Iodo-cy'anide. *Syn.* HYDRARGYRI ET POTASSII IODO-CYANIDUM, L. *Prep.* To a concentrated solution of mercuric cyanide, add a rather strong solution of potassium iodide, and dry the precipitate by a gentle heat.

Prop., &c. Small, white, pearly, crystalline plates or scales. It is chiefly used as a test of the purity of hydrocyanic acid. When put into this liquid, it is instantly turned red if any mineral acid is present.

Mercuric Nitrate. $Hg(NO_3)_2$. *Syn.* PROTONITRATE OF MERCURY, PERNITRATE OF MERCURY. *Prep.* 1. (NEUTRAL.) This is obtained by solution of mercuric oxide, in excess of nitric acid. The solution, evaporated in a bell-jar over sulphuric acid, yields crystals which are neutral. The same compound is obtained as a crystalline powder when the syrupy liquid is dropped into strong nitric acid.

(BASIC.) 1st. $2Hg(NO_3)HO.H_2O$. *Prep.* *a.* By saturating hot dilute nitric acid with mercuric oxide. The salt, which is bibasic, crystallises on cooling.

b. By dissolving mercury in excess of nitric acid, with heat, until the solution, when diluted with distilled water, ceases to give a precipitate with common salt. It is now a mixed solution of the neutral and bibasic pernitrates; but by evaporation crystals of the latter salt only are deposited. The acid solution (before evaporation) is used as a caustic in cancerous, syphilitic, and other ulcerations; but it frequently produces intense pain, and occasionally the usual constitutional effects of mercury. It was formerly given in similar cases to those in which the bichloride is now employed.—*Dose.* (Of the dry salt) 1/30 to 1/12 gr. This is the preparation ordinarily referred to under the name 'pernitrate of mercury.'

2nd. $2Hg(NO_3)HO.HgO$. *c.* By saturating strong nitric acid with mercury, by heat, throwing the solution into cold water, and collecting and drying the precipitate. This salt, which is tribasic, is also formed when the preceding crystallised salts are put into hot water.

Obs. This last preparation is a heavy, yellow powder, but the shade varies according to its basicity, which increases with the temperature of the water employed to effect the precipitation, until, at the boiling temperature, the colour is a dull red. It is extensively employed for the extemporaneous preparation of the ointment of nitrate of mercury, according to the formula on the following label which accompanies each bottle:—"Hydrarg. subnitras." "Two scruples, mixed with one ounce of simple cerate, make the ung. hydrarg. nit. of the London Pharmacopœia." We need scarcely add that this statement, so unblushingly uttered, is a dangerous falsehood. An ointment so made possesses neither the quantity of mercury nor of nitric acid employed in the Pharmacopœia preparation, besides wanting many of its most sensible and valuable properties.

Mercuric Oxide. HgO. *Syn.* PROTOXIDE OF MERCURY, RED OXIDE OF MERCURY, OXIDE OF M., BINOXIDE OF M., DEUTOXIDE OF M., PEROXIDE OF M.; HYDRARGYRI OXYDUM, H. O. RUBRUM, L. There are several methods by which this substance may be prepared. The following are those which have been ordered at different times in the Pharmacopœias:—

1. By Precipitation (HYDRARGYRI BINOXYDUM—Ph. L. 1836). Mercuric chloride (corrosive sublimate), 4 oz.; distilled water, 6 pints; dissolve, and add of liquor of potass, 28 fl. oz.; drain the precipitate, wash it in distilled water, and dry it by a gentle heat.

Obs. A bright orange-red powder. It usually contains a little combined water; hence its readier solubility in acids than the oxide prepared by heat. When heated sufficiently, it yields oxygen, and the mercury either runs into globules or is totally dissipated. It is entirely soluble in hydrochloric acid. (Ph. L. 1836.) The preparation of the shops has frequently a brick-red colour, and contains a little oxychloride, arising from too little alkali being used.

2. By calcination of the nitrate (RED PRECIPITATE; HYDRARGYRI NITRICI OXYDUM, Ph. L. HYDRARGYRI OXIDUM RUBRUM, B. P., Ph. L., Ph. D.). *Prep.* B. P. Mercury, by weight, 8; nitric acid, 4½; water, 2. Dissolve half the mercury in the water and acid, evaporate to dryness, and triturate with the rest of the mercury until well blended. Heat in a porcelain capsule, repeatedly stirring, until acid vapours cease to be evolved.

Mercury, 3 lbs.; nitric acid, 18 fl. oz. (1½ lb., Ph. L. 1836); water, 2 quarts; dissolve by a gentle heat, evaporate to dryness, powder, and calcine this in a shallow vessel, with a gradually increased heat, until red vapours cease to arise. The processes of the Ph. E. and D. are similar, except that the Dublin College directs the evaporation and calcination to be performed in the same vessel, without powdering or stirring the mass.

Obs. Bright red crystalline scales, which usually contain a little undecomposed pernitrate of mercury; in other respects, it resembles the last two preparations. It is more generally used as an escharotic and in ointments than the precipitated oxide. It is volatilised by heat without the evolution of nitrous vapours.

According to Mr. Brande, it contains about 2½ per cent. of nitric acid. According to Mr. Barker, the process of the Ph. D. yields the finest coloured product; but Mr. Brande states that "the nitrate requires to be constantly stirred during the process, which is usually performed in a cast-iron pot." On the large scale, the evaporation is generally conducted in a shallow earthen dish, and as soon as the mass becomes dry a second dish is inverted over it, and the calcination is continued, without disturbance, until the process is concluded. The heat of a sand bath is employed. 100 lbs. of mercury and 48 lbs. of nitric acid (sp. gr. 1·48) yields 112 lbs. of red precipitate. (Brande.)

Uses, &c. Red oxide of mercury, whether obtained by calcination or precipitation, possesses the same general properties. It is very slightly soluble in water, but sufficiently so to give that fluid an alkaline reaction and a metallic taste. It was formerly employed in medicine to induce salivation; but is now chiefly used as an escharotic, either in the form of powder or made into an ointment.—*Dose.* ⅛ to 1 gr., combined with opium. It is very poisonous.

Mercuric Sulphate. $HgSO_4$. *Syn.* PROTO-

SULPHATE OF MERCURY; HYDRARGYRI SULPHAS, H. PERSULPHAS, H. BIPERSULPHAS, L. *Prep.* 1. (NEUTRAL.)—*a.* By boiling together sulphuric acid and metallic mercury until the latter is wholly converted into a heavy, white, crystalline powder; the excess of acid is removed by evaporation. Equal weights of acid and metal may conveniently be employed.

b. (Ph. D. 1826.) Dissolve mercury, 6 parts, in a mixture of sulphuric acid, 6 parts, and nitric acid, 1 part, by boiling them in a glass vessel, and continue the heat until the mass becomes perfectly dry and white. Used to make calomel.

2. (BASIC.) $HgSO_4 . {}_2HgO$. *Syn.* TRIBASIC SULPHATE OF MERCURY, TURPETH MINERAL, TURBITH M., QUEEN'S YELLOW, SUBSULPHATE OF MERCURY†, TRIBASIC PERSULPHATE OF M.; HYDRARGYRI SUBSULPHAS, H. S. FLAVUS, TERPETHUM MINERALE, L.—*a.* Dissolve mercury in an equal weight of sulphuric acid by boiling them to dryness, fling the mass into hot water, and wash and dry the resulting yellow powder.

b. (Ph. D. 1826.) Mercuric sulphate, 1 part; warm water, 20 parts; triturate together in an earthen mortar, wash well with distilled water, drain, and dry it.

Prop., &c. A heavy, lemon-yellow powder, soluble in 2000 parts of cold, and about 600 parts of boiling water. By long-continued washing with very hot water, it loses all its remaining acid, and is at length converted into red oxide of mercury.—*Dose.* As an alterative, $\frac{1}{8}$ to $\frac{1}{4}$ gr.; as an emetic, 3 to 5 grs.; as an errhine, 1 gr., mixed up with a pinch of liquorice powder or mild snuff. It is a powerful poison, and one of the least useful of the mercurial preparations.

Obs. The temperature of the water employed to decompose the neutral sulphate influences the shade of colour of the resulting salt, in a similar manner to that pointed out under the nitrate. It is now superseded as a pigment by chrome yellow and orpiment, which are not only more beautiful, but cheaper preparations.

Mercuric Sulphide. HgS. *Syn.* PROTOSULPHIDE OF MERCURY, RED SULPHURET OF MERCURY, FACTITIOUS CINNABAR, VERMILION, SULPHURET OF MERCURY, SULPHIDE OF M., BISULPHURET OF M.†; HYDRARGYRI BISULPHURETUM (Ph. L.), CINNABARIS (Ph. E.), H. SULPHURETUM RUBRUM, L. *Prep.* (Ph. L.) Quicksilver, 24 oz.; sulphur, 5 oz.; melt together, and continue the heat till the mixture swells up, then cover the vessel, remove it from the heat, and when cold, powder, and sublime it. The formulæ of the other colleges are similar.

Prop., &c. Mercuric sulphide has a dark-red semi-crystalline appearance in the mass, but acquires a brilliant scarlet colour by powdering. It is tasteless, odourless, and insoluble. It is chiefly used as a pigment; but it is occasionally employed in medicine as a diaphoretic and vermifuge, and in some cutaneous diseases, and gout.—*Dose.* 10 to 30 grs.; as a fumigation, about $\frac{1}{2}$ dr. is thrown on a plate of iron heated to dull redness. For the last purpose it is inferior to mercurious oxide, owing to the more irritating nature of its vapour.

Tests. MERCUROUS SALTS. Sulphuretted hydrogen and ammonium sulphide give black precipitates, insoluble in dilute acids, ammonium sulphide, potassium cyanide, and hot nitric acid, but slightly soluble in sodium sulphide, and decomposed by nitrohydrochloric acid.

Potassium hydrate and ammonia give dark gray or black precipitates, which are insoluble in excess of the precipitant.

Hydrochloric acid and the soluble metallic chlorides occasion a precipitate, which assumes the form of a very fine powder of dazzling whiteness, insoluble in excess, but soluble in aqua regia and liquid chlorine. Potassium hydrate and ammonia turn it dark gray or black.

Potassium iodide gives a greenish-yellow precipitate, soluble in ether, and subliming in red crystals when heated.

Mercurous Acetate. $Hg(C_2H_3O_2)$. *Syn.* ACETATE OF MERCURY, SUBACETATE. *Prep.* (P. Cod.) Dissolve mercurous nitrate, 1 part, in water (slightly acidulated with nitric acid), 4 parts, and precipitate the liquid with a solution of sodium acetate, gradually added, until in slight excess; carefully wash the precipitate with cold water, and dry it in the shade.

Prop., &c. Small, white, micaceous, flexible scales; insoluble in alcohol; soluble in about 300 parts of water; blackened by light; and carbonized by a strong heat. It has been said to be one of the mildest of the mercurials; but this cannot be the case, as it occasionally acts with great violence on both the stomach and bowels, producing much pain and prostration.—*Dose.* $\frac{1}{6}$ to 1 gr., night and morning, gradually increased.

Mercurous Bromide. HgBr. *Syn.* SUBBROMIDE OF MERCURY; HYDRARGYRUM BROMIDUM, L. *Prep.* (Magendie.) By precipitating a solution of mercurous nitrate by another of potassium bromide. It closely resembles calomel, in both its appearance and properties.—*Dose.* 1 to 5 grs.

Mercurous Chloride. HgCl or Hg_2Cl_2. *Syn.* CALOMEL, SUBCHLORIDE OF MERCURY, MERCURY CHLORIDE; HYDRARGYRI SUBCHLORIDUM (B. P.), HYDRARGYRI CHLORIDUM (Ph. L.), H. C. MITE (Ph. U. S.), CALOMELAS (Ph. E. & D.), L. This substance is one of the best known, and probably the most valuable, of all the mercurials.

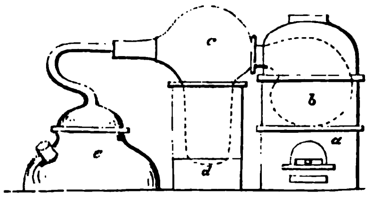
Prep. 1. (Ph. L.) Mercury, 2 lbs.; sulphuric acid, $21\frac{1}{2}$ fl. oz.; mix, boil to dryness (in a cast-iron vessel), and when the resulting mass has cooled, add of mercury, 2 lbs., and triturate the ingredients in an earthenware mortar until they are well mixed; then add of sodium chloride 1½ lb., and again triturate until the globules are no longer visible; next sublime the mixture, reduce the sublimate to the finest possible powder, diligently wash it with boiling distilled water, and dry it.—*Prod.* 117 to 118% of the weight of mercury employed.

2. (Ph. E.) Mercury, 4 oz., is dissolved in a mixture of sulphuric acid, 2 fl. oz. 3 fl. drs., and nitric acid, ½ fl. oz., by the aid of heat; when cold, mercury, 4 oz., is added, and the remainder of the process is conducted as before.

3. (CALOMELAS SUBLIMATUM—Ph. D.) Sulphate of mercury, 10 parts; mercury, 7 parts; dry sodium chloride, 5 parts; triturate, &c., as before, and afterwards resublime it into a large chamber or receiver.

4. (Apothecaries' Hall.) Quicksilver, 50 lbs., and sulphuric acid, 70 lbs., are boiled to dryness in a cast-iron vessel; of the dry salt, 62 lbs. are triturated with quicksilver, 40½ lbs., until the globules are extinguished, when sodium chloride, 34 lbs., is added, and after thorough admixture, the whole is sublimed, &c., as before.—*Prod.* 96 to 100 lbs.

5. (Jewel's Patent.) The receiver, which is capacious, is filled with steam, so that the calomel vapour is condensed in it in a state of extremely minute division. The engr. represents the apparatus now usually employed when this plan is adopted. The product is extremely white, and of the finest quality. It is sometimes called 'hydrosublimed calomel' and 'hydrosublimate of mercury.' The 'flowers of calomel,' of old pharmacy, were prepared in a nearly similar manner.



a. Furnace.
b. An earthenware retort, having a short and wide neck, containing the ingredients for making calomel.
c. An earthen receiver, having three tubulatures.
d. A vessel containing water.
e. A steam-boiler.

6. (Soubeiran.) The crude calomel mixture is heated in an earthen tube in a furnace, and a current of air is directed uninterruptedly into the tube by means of a small ventilator. This sweeps away, as it were, the vapours of calomel, and in a straight tube will carry them a distance of 60 feet, to avoid which the end of the recipient is immersed in water, by which means the calomel is moistened and falls down. This plan, slightly modified, is now extensively adopted in this country.

7. (PRECIPITATED CALOMEL; CALOMELAS PRÆCIPITATUM, L.) Digest pure quicksilver, 9 parts, in nitric acid (sp. gr. 1·02 to 1·25), 8 parts, until no more metal will dissolve, applying heat as the effervescence ceases; then mix the hot liquid quickly with a boiling solution of sodium chloride, 8 parts, dissolved in water (slightly acidulated with hydrochloric acid), 64 parts; lastly, well wash the precipitate in boiling distilled water, and dry it. The product, when the process is skilfully managed, is perfectly white and pure.

Prop. A heavy, white, tasteless powder; insoluble in water, alcohol, and cold dilute nitric acid; volatilises at a temperature below redness, and yields a white or yellowish-white sublimate; hot nitric acid oxidises and dissolves it; alkalies, the alkaline carbonates, and lime water, decompose it, with the production of the black oxide; ammonia converts it into a dark slate-gray coloured powder (BLACK PRECIPITATE—Kane). Sp. gr. 7·14 (Boullay; 7·156—Pelouze and Fremy; 7·176—Ure).

Pur. Calomel is frequently contaminated with small quantities of corrosive sublimate, which may be detected by digesting a little in alcohol, decanting the clear portion, and testing it with a drop or two of potassium hydrate, when a reddish precipitate will be formed if any mercuric chloride be present. It is pulverulent, whitish, and sublimes (entirely) by heat. It becomes black on the addition of potassium hydrate, then, heat being applied, it runs into globules of mercury. Neither silver nitrate, lime water, nor sulphuretted hydrogen, being added to the water in which it has been washed or boiled throws down anything.

Uses. Calomel is one of the milder mercurials, and in this respect takes its position immediately after blue pill, mercury with chalk, and the gray oxide; but it probably ranks before all the other salts of mercury. Universal experience appears to show it to be a most valuable alterative, when judiciously administered. With this intention it is given in doses of ½ to 1 gr., generally combined with antimonials, as in Plummer's pill, and repeated every night, or every other night, for some time, followed by a mild saline aperient in the morning. As a purgative, 2 to 5 grs., either combined with or followed by other purgatives, as jalap, rhubarb, senna, colocynth, Epsom salt, &c. As a vermifuge, 2 to 5 grs. over-night, followed by a sufficient dose of castor oil next morning. Combined with opium, it is frequently used in various complaints to produce salivation, or bring the system under the influence of mercury. It is also employed as a sedative and errhine, and in a vast number of other indications. It is, indeed, more frequently used, and in a greater variety of complaints, than probably any other medicine.

Obs. Of the two methods of preparing calomel, that by precipitation is not only the best, but the most economical. That by sublimation is, however, the one generally adopted in England. Mr. Brande states that "a small portion of sodium chloride is apt to remain combined with it, which might affect its medical uses." Such a contamination is not found in carefully prepared 'precipitated calomel,' although we doubt whether the quantity of it which exists in any of the samples we have met with (being merely a trace) would at all interfere with its therapeutical action; more especially when it is recollected that alkaline chlorides are present in, not merely the primæ viæ, but also in every part of the animal body. The late Mr. Fownes, a chemist, who was unsurpassed in the accuracy of his researches, and the caution and delicacy with which he expressed his opinions, once assured us that calomel was more easily and cheaply prepared of the best quality by precipitation than by sublimation, and that if, from careless manipulation, it occasionally contained a minute quantity of common salt, this was of much less importance than the contamination of corrosive sublimate, which was frequently present in samples of sublimed calomel.

To produce a superior article of calomel in the dry way is a somewhat difficult task, and the process frequently fails in the hands of inexperienced operators. The solution of the mercury is best made in an iron vessel, and the sublimation should be conducted (preferably) in an earthenware retort with a short but very wide neck, and fitted to a spacious receiver, having a large flat bottom, also of earthenware, and containing a little cold water. On the small scale the heat may be applied by means of a sand bath. The form above given for calomel, by precipitation, produces a large product, perfectly free from corrosive sublimate and mercurous nitrate, and is consequently free from the objections frequently raised against that mode of preparing it.

"The form in which calomel sublimes depends much upon the dimensions and temperature of the subliming vessels. In small vessels it generally condenses in a crystalline cake, the interior surface of which is often covered with beautiful quadrangular prismatic crystals, transparent, and of a texture somewhat elastic or horny. In this state it acquires, by the necessary rubbing into powder, a decidedly yellow or buff colour, more or less deep, according to the degree of trituration it has undergone. If, on the contrary, the calomel be sublimed into a very capacious and cold receiver, it falls in an impalpable and perfectly white powder, which requires only one elutriation to fit it for use; it then remains perfectly colourless." (Brande.)

The long-continued action of steam on calomel in a state of minute division is attended by the formation of a small quantity of corrosive sublimate. (Righini.) Boiling water, hot air, and light, also produce a like effect.

Mercurous Iodide, HgI. *Syn.* Subiodide of mercury, Green iodide of mercury, Mercurious iodide; Hydrargyri iodidum viride (B. P.), Hydrargyri subiodum, H. iodidum (*Ph. L.*), H. i. viride (Ph. D.), L. *Prep.* 1. (B. P.) Mercury, 1 oz.; iodine, 278 grs.; rectified spirit, a sufficiency. Rub the iodine and mercury in a porcelain mortar, moistening occasionally with a few drops of spirit, and continue the trituration until the mass assumes a uniform green colour, and no metallic globules are visible.

2. Precipitate a solution of mercurous nitrate by another of mercurous potassium iodide; wash the precipitate, first in a solution of sodium chloride, and then in pure water; lastly, dry it in the shade.

3. (Ph. L.) Mercury, 1 oz.; iodine, 5 drs.; triturate together, gradually adding of rectified spirit, q. s. (about 1 to 2 fl. drs.), until globules are no longer seen; dry the powder, by a gentle heat, in the shade, as quickly as possible, and preserve it in a well-stopped black glass vessel. The formula of the Ph. D. is similar.

Prop., &c. A heavy, greenish-yellow powder; insoluble in water, alcohol, and a solution of common salt; soluble in ether, and slightly so in an aqueous solution of iodide of potassium. "Freshly prepared, it is yellowish. Heat being cautiously applied, it sublimes in red crystals, which quickly turn yellow, and, on access of light, blacken. It is insoluble in a solution of chloride of sodium." The process of the Ph. L. and F. P. does not answer when larger quantities than 4 or 5 oz. are prepared at once, owing to the great heat generated by the reaction of the ingredients, and the consequent volatilisation of a portion of the iodine, by which the colour of the product suffers.—*Dose.* $\frac{1}{8}$ to 1 gr., made into pills; "in syphilis and scrofula, especially where they occur in the same individual." It is also used externally, in the form of ointment. It is very poisonous.

Mercurous Nitrate. $HgNO_3$. *Syn.* Subnitrate of mercury; Hydrargyri subnitras, H. nitras, H. protonitras, L. *Prep.* 1. (Neutral.) By digesting mercury in excess of cold dilute nitric acid, observing to remove the short prismatic crystals within a short time after they are formed; these, when drained, and redissolved in water slightly acidulated with nitric acid, furnish crystals of pure neutral mercurous nitrate by cautious evaporation.

2. (Basic.) Deposited after some time, when excess of mercury has been employed as above. A finely crystallized salt.

Prop., &c. Both the above are decomposed by water, but the former may be dissolved in a very small quantity without decomposition. When the neutral salt is triturated with an excess of sodium chloride, and water subsequently added, the whole of the mercury is thrown down as calomel, and the filtered supernatant liquid does not contain corrosive sublimate. If this last salt is detected, the salt examined contained mercuric nitrate, and if any basic mercurous nitrate was present, the newly formed calomel has a gray or black colour, due to presence of oxide.—*Dose.* Of the neutral salts, 1/16 to 1/8 gr. It is seldom used internally. A solution is sometimes employed as a mild caustic to ulcers; and, more dilute, as a lotion in lepra, porrigo, psoriasis, &c.; or made into an ointment, in the same diseases.

Mercurous Oxide. Hg_2O. *Syn.* SUBOXIDE OF MERCURY, GRAY O. OF M., BLACK O. OF M., MERCUROUS O., DIOXIDE OF M., PROTOXIDE OF M.†; HYDRARGYRI SUBOXYDUM, H. OXYDUM, H. O. CINEREUM, H. O. NIGRUM, L. *Prep.* 1. (Ph. L. 1836.) Calomel, 1 oz.; lime water, 1 gall.; mix, agitate well together, decant the clear liquid after subsidence, and well wash the sediment with distilled water; lastly, drain and dry it, wrapped in bibulous paper, in the air.

2. (Ph. D. 1826.) Sublimed calomel, 1 part; solution of potassium hydrate (warm), 4 parts; triturate together, &c., as last.

3. Briskly triturate calomel in a mortar with pure potassium hydrate, in excess; wash it with cold water, and dry it in the shade.

Prop., &c. A very dark gray or black powder, suffering decomposition by exposure to light and air, becoming olive coloured, from a portion being resolved into metallic mercury and binoxide. Digested for a short time in dilute hydrochloric acid, it remains undissolved, and the filtered liquid is not affected by potassium hydrate, or by ammonium oxalate. It is totally soluble in acetic acid, and entirely dissipated by heat. As a medicine, pure mercurous oxide is one of the mildest of the mercurials, and is used both internally and externally; but chiefly as a fumigant, or made into an ointment.—*Dose.* ½ gr. to 3 grs. twice a day.

Mercurous Phosphate. *Syn.* HYDRARGYRI PHOSPHAS, L. *Prep.* Add a solution of mercurous nitrate (slightly acidulated with nitric acid) to a solution of sodium phosphate, and wash and dry the precipitate which forms. In its physical characters it closely resembles calomel, than which it is said to be more appropriate in certain cases, especially in secondary syphilis. Alkalies turn it black.—*Dose.* ¼ to 1 gr., made into a pill with sugar and aromatics.

Mercurous Sulphate. Hg_2SO_4. *Syn.* SUBSULPHATE OF MERCURY, SULPHATE OF THE SUBOXIDE OF M., PROTOSULPHATE OF M.†; HYDRARGYRI SUBSULPHAS, L. *Prep.* By adding sulphuric acid to a solution of mercurous nitrate. The salt falls as a white crystalline powder.

Mercurous Sulphide. Hg_2S. *Syn.* SUBSULPHIDE OF MERCURY; HYDRARGYRI SUBSULPHURETUM CUM SULPHURE, H. S. NIGRUM, L. *Prep.* 1. (Pure.) This falls as a black precipitate when a solution of mercurous nitrate is treated with sulphuretted hydrogen or ammonium sulphide.

2. (Impure; ETHIOP'S MINERAL; HYDRARGYRI SULPHURETUM CUM SULPHURE, H. S. NIGRUM—Ph. L. 1824 & Ph. D. 1826); ÆTHIOPS MINERALIS—Ph. L. 1836 & Ph. D. 1826.) Quicksilver and sulphur, equal parts, triturated together (in a stoneware mortar—Ph. D.) until globules are no longer visible.

Prop., &c. The last preparation is alone employed medicinally. It is a heavy, insoluble, black powder. It is frequently met with imperfectly prepared, and sometimes adulterated. It is said to be a mixture of mercurous sulphide and sulphur, in variable proportions depending on the length of the trituration. On the large scale it is generally made by melting the ingredients together, and afterwards reducing the mass to a fine powder in a mill or mortar. It is said to be vermifuge and alterative, and has been used in some cutaneous and glandular diseases, but appears to be nearly inert.—*Dose.* 5 to 30 grs.

MERCURY, OTHER PREPARATIONS OF.

Hahnemann's Mercury. *Syn.* HAHNEMANN'S SOLUBLE MERCURY, H.'S BLACK OXIDE OF M., BLACK PRECIPITATE OF M.; HYDRARGYRI PRÆCIPITATUM NIGRUM, MERCURIUS SOLUBILIS HAHNEMANNI, L.—*a.* By dropping weak ammonia into a solution of mercurous nitrate as long as the precipitate formed is of a black colour; the powder is washed, dried in the shade without artificial heat, and then preserved from the light and air.

(Ph. Bor. 1847.) Solution of mercurous nitrate (recent; sp. gr. 1·1), 9½ oz.; distilled water, 2 lbs.; mix, filter, and add to the solution of ammonia (sp. gr. ·960), ½ oz., diluted with water, 4 fl. oz.; collect the powder immediately on a filter, wash it with water, 5 fl. oz., and dry it, &c., as before. A vĕry black powder.—*Dose.* ¼ to 1 gr.

Precipitates of Mercury. 1. BLACK PRECIPITATE, Hahnemann's soluble mercury (basic mercurous and ammonium nitrate). 2. GREEN P. (MERCURIUS PRÆCIPITATUS VIRIDIS, LACERTA VIRIDIS), from equal parts of mercury and copper, separately dissolved in nitric acid, the solutions mixed, evaporated to dryness, and then calcined until red fumes cease to arise. Caustic. 3. RED P., mercuric oxide. 4. WHITE P., ammonio-chloride of mercury.

Ward's Mercury. *Syn.* AMMONIO-NITRATE OF MERCURY; HYDRARGYRI AMMONIÆ NITRAS, L. To nitric acid, 4 parts, contained in a spacious bolt-head or matrass, add, gradually, ammonium sesquicarbonate, 2 parts; afterwards add of mercury, 1 part, and digest in a gentle heat, until the solution is complete.

MES'LIN. A mixture of various kinds of grain. (Brande.)

METAGAL'LIC ACID. Obtained by heating dry gallic acid, by a quick fire, to about 480° Fahr., or until it froths, melts, and becomes black and solid, then dissolving the residuum in an alkali, filtering, and precipitating by an acid. An insoluble, black powder.

MET'AL. *Syn.* METALLUM, L. See METALS.

METAL'LICA. [L.] Preparations of the metals. One of the divisions of the Ph. L.

METAL'LIC TREES. See VEGETATION (Metallic).

METAL'LO-CHROMES. A name given by Nobili to extremely thin films of peroxide of lead deposited by electrolytic action upon plates of polished steel, so as to produce an iridescent play of colours. The effect is often very beautiful.

MET'ALLOIDS. A name sometimes applied to the NON-METALLIC ELEMENTS.

METAL'LURGY. "The art of extracting metals from their ores, and adapting them to various processes of manufacture." (Percy.) "Notwithstanding the striking analogy which exists between common chemical and metallurgic operations, since both are employed to isolate certain bodies from each other, there are essential differences which should be carefully noted. In the first place, the quantity of materials being always very great in metallurgy, requires corresponding adaptations of apparatus, and often produces peculiar phenomena; in the second place, the agents to be employed for treating great masses must be selected with a view to economy, as well as chemical action. In analytical chemistry, the main object being exactness of result and purity of product, little attention is bestowed upon the value of the reagents, on account of the small quantity required for any particular process. But in smelting metals upon the large scale, profit being the sole object, cheap materials and easy operations are alone admissible."[1]

The limits of this work do not permit of more than a general reference to the leading operations of metallurgy under this head. These are—digging, picking or sorting, stamping or crushing, and washing, included under the general term, 'dressing ores;'—roasting or calcination, which is either performed with the fuel in contact with the ore, or in reverberatory furnaces; and the liquation or reduction to the reguline form. The application of these processes is noticed under the leading metals. Those who desire to study the subject minutely are referred to the treatises of Dr. Percy, Robert Hunt, Karsten, and Le Play.

MET'ALS. *Syn.* METALLA, L. Metals are elementary bodies, which are generally distinguished by their lustre and power of conducting heat and electricity. When their solutions are electrolysed, the metals always appear at the electro-negative surface, and are hence termed electro-positive elements.

Formerly, when science was much less advanced than at present, the metals constituted a well-defined class. The properties which were regarded as specially characteristic were physical, and were not founded on chemical relations; thus, lustre and high specific gravity were considered to be essential characters of all metals. But we are now acquainted with metals which have a lower specific gravity than water (lithium, sodium, &c.), and with so-called non-metallic elements which present a strong metallic lustre (carbon in the state of graphite, crystallized silicon). It will therefore be seen that the term 'metal' is rather conventional than strictly scientific. By far the greater number of elementary bodies at present known are metals. Their physical characters and leading chemical properties are noticed under each of them in its alphabetical place. The following table exhibits some useful particulars:—

TABLE *of some of the properties of some of the metals.*

Names arranged in the order of their	
Ductility.	Malleability.
Gold.	Gold. .
Silver.	Silver.
Platinum.	Copper.
Iron.	Tin.
Nickel.	Platinum.
Copper.	Lead.
Zinc.	Zinc.
Tin.	Iron.
Lead.	Nickel.

Names arranged in the order of their	
Power of conducting Heat.	Power of conducting Electricity.
Silver.	Silver.
Copper.	Copper.
Gold.	Gold.
Tin.	Zinc.
Iron.	Iron.
Lead.	Tin.
Bismuth.	Lead.
	Antimony.
	Bismuth.

METANTIMON'IC ACID. $H_4Sb_2O_7$. The name given by M. Fremy to that variety of antimonic acid obtained by decomposing pentachloride of antimony with excess of water. It differs from common antimonic acid in being tetra, and forming two different classes of salts with the acids. The acid metantimoniate of potassium is the only reagent which yields a precipitate with the sodium salts, and is therefore of great value in chemical analysis. It is prepared by fusing antimonic acid with excess of potassa, in a silver crucible, dissolving the fused mass in a little cold water, and allowing it to crystallize in vacuo. The resulting crystals (metantimoniate of potassa), by solution in pure water, are resolved into free potassa and the acid salt. See ANTIMONY.

METAPEC'TIC ACID. See PECTIN.

METAPEC'TIN. See PECTIN.

METAPHOSPHOR'IC ACID. See PHOSPHORIC ACID.

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[1] "*Ure's Dict. of Arts, Manufactures, and Mines,*" 4th edit.

METHEG'LIN. *Syn.* HYDROMELI, H. VINOSUM, MELLIS VINUM, L. *Prep.* From honey, 1 cwt.; warm water, 24 galls.; stir well until dissolved; the next day add of yeast, 1 pint, and hops, 1 lb., previously boiled in water, 1 gall.; along with water, q. s. to make the whole measure 1 barrel; mix well, and ferment the whole with the usual precautions adopted for other liquors. It contains on the average from 7% to 8% of alcohol. See MEAD.

ME'THYL. CH_3. The hypothetical radical of PYROXYLIC SPIRIT (WOOD-SPIRIT, METHYLIC ALCOHOL) and the methyl series. It forms a number of compounds analogous to those of ethyl.

METHYLATED SPIRIT. A mixture of 1 part of methylic alcohol (wood spirit) and 9 parts of ethylic alcohol (spirit of wine). See SPIRIT.

METHYLIC ALCOHOL. See WOOD SPIRIT.

MEZE'REON. *Syn.* GAROU; MEZEREON BARK, MEZEREI CORTEX (B. P.); MEZEREUM —Ph. L. E. & D. The dried bark of the *Daphne Mezereum*, mezereon; or *Daphne Laureola*, spurge, or wood-laurel. The "bark of the root of *Daphne Mezereum*," or spurge olive. (Ph. L.) A stimulant and diuretic. It is employed as a sudorific and alterative, in syphilis, rheumatism, scrofula, and chronic cutaneous diseases, usually in conjunction with sarsaparilla. It has also been used as a masticatory, in toothache, paralysis of the tongue, &c. On the Continent it is used as a vesicant. For this purpose it is softened by soaking it in hot vinegar, and is then bound on the part, and renewed after intervals of some hours, until vesication is produced.

MICE. See RATS.

MICROCOS'MIC SALT. $NaNH_4HPO_4$. *Syn.* TRIBASIC PHOSPHATE OF SODIUM AND AMMONIUM. *Prep.* 1. Phosphates of soda and ammonia, equal parts; water, q. s.; dissolve separately, mix the solutions, evaporate, and crystallize. A slight excess of phosphate of ammonia aids the crystallisation.

2. (Fownes.) Phosphate of sodium, 6 parts; water, 2 parts; liquefy by heat, and add of sal ammoniac (in powder), 1 part; common salt separates, and after its removal the liquid is concentrated so that crystals may form. *Used* as a flux in blowpipe assays.

MI'CROSCOPE. The value of the microscope in chemistry and the collateral sciences is now so generally acknowledged, that it would be folly to do more than merely to allude to the subject here.

In the COMPOUND MICROSCOPE, which has quite superseded the 'simple microscope' as an instrument of research, the object is magnified in the first instance by the object-glass, and then remagnified by the eye-piece. It follows, therefore, that the magnifying power of the instrument may be increased either by increasing the power of the object-glass or that of the eye-piece. It must be borne in mind, however, that in increasing the power of the eye-piece, we do not magnify the object itself in a greater degree, but simply increase the image of the object formed by the object-glass. Any imperfections which may exist in the latter are thus greatly increased. At first the great drawback to the use of the compound microscope was its deficiency in achromatism; but the researches of Mr. Lester and Dr. Goring led to the achromatising of the object-glass, which was the first of the rapid strides towards perfection made by this instrument during the last twenty years. The two most useful object-glasses are the 'quarter-inch,' which should magnify from 200 to 220 diameters, and the 'inch,' which should magnify from 30 to 40 diameters. The definition of these glasses should be good, and they should transmit plenty of light. Any lines in a structure examined by them should appear sharp and distinct, and there should be no coloured fringes around the object. It is of great importance that the object-glasses are kept perfectly free from dust. A few shreds of wash-leather of the finest quality should be kept in a pill-box for cleaning them. Before rubbing them with the leather they may be breathed upon, but no whiting or liquid of any kind should be used, as each object-glass, being achromatic, is a very delicate piece of workmanship, consisting of two lenses of flint- and crown-glass cemented together by Canada balsam. Compound microscopes are now sold by the best London makers at very low prices. A really good instrument, adapted to most of the wants of the chemical, pharmaceutical, or medical student, may be obtained for five guineas

MIL'DEW. *Syn.* RUST, BLIGHT. The mouldy appearance on the leaves of plants produced by innumerable microscopic fungi. The hop, wheat, and the choicest garden fruit trees, are those most commonly attacked. The causes are said to be excess of moisture, and absence of the free circulation of air and sunshine. On the small scale, finely powdered sulphur is occasionally dusted over the parts affected, as a remedy.

MIL'IARY FEVER. *Syn.* MILIARIA, L. Among the other symptoms are—anxiety and frequent sighing, the perspiration has a strong and peculiar smell, and there is a sensation of pricking on the neck and breast, followed by an eruption of small red pimples, which in two or three days become white vesicles, dry up, peel off, and are succeeded by others. The moist weather of spring and autumn are the period in which it is most prevalent; and delicate females, particularly in child-bed, are those most liable to its attacks. Sometimes it assumes a malignant character. The *treatment* of this affection consists chiefly in combating the depression of the system by a supporting diet; but everything that heats or stimulates the skin should be avoided. The apartment should be kept cool and well ventilated, and cooling saline laxatives and bitter tonics, with cooling drinks, should also be had recourse to.

MILK. *Syn.* LAC, L. The value of milk as an article of food is clearly shown by the fact of it being sufficient to support, and to increase the growth of, the young of every species of the mammalia; at once supplying materials for the formation of the osseous, fleshy, and liquid portions of the body. "The substances present in milk are wonderfully adapted to its office of producing materials for the rapid growth and development of the animal frame. It contains an azotized matter, casein, nearly identical in composition with muscular flesh, fatty principles, and a peculiar sugar, and, lastly, various salts, among which may be mentioned phosphate of lime, held in complete solution in a slightly alkaline liquid.

"The white, and almost opaque, appearance of milk is an optical illusion. Examined by a microscope of even moderate power, it is seen to consist of a perfectly transparent fluid, in which float about numbers of minute transparent globules; these consist of fat surrounded by an albuminous envelope, which can be broken mechanically, as in the churning, or dissolved by the chemical action of caustic potassa, after which, by agitating the milk with ether, the fat can be dissolved." (Fownes.)

Comp. Cows' MILK, of average quality, contains from 10% to 12% of solid matter when evaporated to dryness by steam heat, and has the mean sp. gr. 1·030; while that of the skimmed milk is about 1·035; and of the cream, 1·0244. (Ure.) The average CREAM of cows' milk contains 4·5% of butter; 3·5% of curd, and 92% of whey. (Berzelius.) The SKIMMED MILK consists of water, 92·9%; curd, 2·8%; sugar of milk, 3·5%; lactic acid, lactate of potassa, and a trace of lactate of iron, ·6%; chloride of potassium, phosphate of potassa, and earthy phosphates (lime), ·2%. (Berzelius.)

The following analysis of fresh milk is by M. Haidlen:—

Water	873·00
Butter	30·00
Casein	48·20
Milk sugar . . .	43·90
Phosphate of lime . .	2·31
„ magnesia .	·42
„ iron . .	·07
Chloride of potassium .	1·44
„ sodium . .	·24
Soda in combination with casein	·42
	1000·

Prop. These are well known. Perfectly fresh milk is slightly alkaline, but soon becomes acid on exposure to the air, and after coagula of casein (CURDS) separate from it. This change is immediately effected by the addition of rennet or an acid. That from the first, when dried and pressed, constitutes cheese.

Pur., tests, &c. The common frauds practised by the milk-dealers are the addition of water and the subtraction of part of the cream. Sometimes potato starch is added to the milk, to give it a creamy or rich appearance, and this addition is still more frequently made to cream, to increase its consistence and quantity. The method of detecting the first two of these frauds is noticed under 'LACTOMETER.' The presence of potato starch may be determined by boiling some of the milk with a little vinegar, and after separating the coagula by a strainer, and allowing the liquid to become cold, testing it with solution or tincture of iodine. If it turns blue, starch, flour, or some other amylaceous substance, has been used to adulterate it. In most cases it will be sufficient to apply the test to the unprepared suspected milk.

It has frequently been stated that chalk, plaster of Paris, gum, gelatin, sugar, flour, mucilage of hemp-seed, the brains of animals, and other similar substances, are often added to London milk, but there is no reason to suppose there is any truth in these assertions, as some of these articles are too costly to be used, and the presence of others would so alter the flavour or appearance of the milk, or would so soon exhibit themselves by subsidence, as to lead to their detection.

Pres. Milk may be preserved in stout bottles, well corked, and wired down, by heating them, in this state, to the boiling-point, in a water bath, by which means the oxygen of the small quantity of enclosed air becomes absorbed. It must be afterwards stored in a cool situation. By this method, which is also extensively adopted for the preservation of green gooseberries, green peas, &c., milk will retain its properties unaltered for years. A few grains of carbonate of magnesia, or, still better, of bicarbonate of potassa or soda, may be advantageously dissolved in each bottle before corking it.

Under Bethel's patent the milk or cream is scalded, and, when cold, strongly charged with carbonic acid gas, by means of a soda-water machine, and the corks are wired down in the usual manner. The bottles should be kept inverted, in a cool place.

An excellent method of preventing milk from turning sour, or coagulating, is to add to every pint of it about 10 or 12 grs. of carbonate or bicarbonate of soda. Milk thus prepared may be kept for eight or ten days in temperate weather. This addition is harmless, and, indeed, is advantageous to dyspeptic patients. According to D'Arcot, $\frac{1}{1000}$th part of the bicarbonate is sufficient for the purpose. An excess of alkali used in this manner may be detected by the milk turning turmeric paper brown, even after it has been kept some hours, and by the ash obtained by evaporating a little to dryness, and then heating it to dull redness, effervescing with an acid. (See *below.*)

⁂ Milk should not be kept in lead or zinc vessels, as it speedily dissolves a portion of these metals, and becomes poisonous.

Concluding remarks. The principal difference between cows' milk and human milk consists in the former containing more casein and less sugar of milk than the latter. The remarkable indisposition to coagulate is another character which distinguishes human milk from cows' milk. Prof. Falkland, who has practically investigated the subject has prepared a nutritive fluid for infants from cows' milk, closely resembling that of the healthy adult woman. His process is, however, unnecessarily complicated, and, therefore, unsuited to those who would have to employ it in the nursery. To remove this objection we have adopted the following formula;—Sugar of milk, 2 oz.; hot water, ¼ pint; dissolve, and, when the liquor has become quite cold, add it to fresh cows' milk, ¾ pint, and stir them together. This quantity, prepared morning and evening, will constitute the proper food for an infant of from 5 to 8 months old. More may be allowed it if it 'craves' it; but there must be no 'cramming.' At first it will be advisable to remove a little of the cream from the milk before adding to it the saccharine solution; but after a few days this will be found to be unnecessary, and, indeed, injurious. One very important particular to be attended to is, the employment of pure cow's milk, obtained from a healthy grass-fed animal only. With this precaution, and the use of a good FEEDING-BOTTLE, the infant will thrive nearly as well as on the breast of any human female, excepting its mother's. (See *below.*)

ASSES' MILK closely resembles human milk in colour, smell, and consistence, but it contains rather less cream. (See *below.*)

EWES' MILK closely resembles cows' milk, than which, however, it is slightly richer in cream.

GOATS' MILK, for the most part, resembles cows' milk, but its consistence is much greater, and it contains much more solid matter. (See *below.*)

MARES' MILK, in consistence, is between that of cows' and human milk. Its cream is not converted into butter by agitation. See BUTTER, CHEESE, LACTIC ACID, &c.

Al'mond Milk. See EMULSION and MIXTURE.

Arrow-root Milk. *Prep.* From arrow-root, 1 table-spoonful, first wetted and stirred with a little cold water, afterwards adding, gradually, of boiling water, ½ pint; and, lastly, of boiling milk, ½ pint; with sugar, spice, wine, &c., to palate. Very nutritious, and excellent in chronic diarrhœa. Some persons employ all milk.

Choc'olate Milk. *Prep.* Dissolve chocolate (scraped), 1 oz., in boiling new milk, 1 pint. Nutritious; but apt to offend delicate stomachs.

Cof'fee Milk. *Prep.* 1. Coffee, 1 oz.; boiling water, ¼ pint; infuse for 10 or 15 minutes in a warm situation, and add the strained liquid to boiling milk, ¾ pint.

2. Coffee, 1 oz.; tie it loosely in a piece of muslin, and simmer it for 15 minutes in milk, 1 pint. Both the above have been recommended for persons of spare habits, and for those disposed to affections of the lungs, more especially for the asthmatic.

Facti"tious Milk. *Syn.* ARTIFICIAL MILK. Of the numerous compounds which have been proposed as substitutes for natural milks, the following are examples:—

1. (FACTITIOUS ASSES' MILK; LAC ASININUM FACTITIUM, LAC A. ARTIFICIALE, L.)—*a.* Cows' milk, 1 quart; ground rice, 1 oz.; oringo root (bruised), 1 dr.; boil, strain, and add sugar candy (or white sugar), 1 oz.

b. Whites of 2 eggs; lump sugar, 1 oz.; cows' milk (new), ¾ pint; mix, then add syrup of tolu, ¾ oz.

c. Water, 1 pint; hartshorn shavings, 1 oz.; boil to a jelly; then add lump sugar, 2 oz.; cool, add new milk, 1 pint; syrup of tolu, ½ oz. *Used* as substitutes for asses' milk, taken freely as a beverage. A cupful, with or without a spoonful of rum, 3 or 4 times daily, is a popular remedy in consumption and debility.

2. (F. GOATS' MILK—A. T. Thomson.) Fresh mutton suet (minced), 1 oz.; tie it in a muslin bag, and boil it in cows' milk, 1 quart; lastly, add of sugar candy, 2 gr. In scrofulous emaciation, and in the latter stages of phthisis. The proportion of suet in the above may be advantageously increased a little. The LAC CUM SERO of Guy's Hospital is a similar preparation.

3. (F. HUMAN MILK; LAC HUMANUM FACTITIUM, L.)—*a.* See *above.*

b. (Rosenstein.) Almonds (blanched), 2 in number; white sugar, 1 dr.; water, 4 fl. oz.; make an emulsion, strain, and add of fresh cows' milk, 6 fl. oz. As a substitute for the breast in nursing.

Preserved' Milk. *Syn.* MILK POWDER; LACTIS PULVIS, LAC PULVERATUM, L. *Prep.* 1. Fresh skimmed milk, 1 gall.; carbonate of soda (in very fine powder), 1½ dr.; mix, evaporate to 1-3rd by the heat of steam or a water bath, with constant agitation, then add of powdered white sugar, 3½ lbs., and complete the evaporation at a reduced temperature; reduce the dry mass to powder, add the cream (well drained) which was taken from the milk, and after thorough admixture put the whole into well-stoppered bottles or tins, which must be at once hermetically sealed.

2. (Legrip.) Carbonate of soda, ½ dr.; water, 1 fl. oz.; dissolve, add of fresh milk, 1 quart; sugar, 1 lb.; reduce it by heat to

the consistence of a syrup, and finish the evaporation on plates by exposure in an oven.

Obs. About an ounce of the powder agitated with a pint of water, forms an agreeable and nutritious drink, and a good substitute for milk at sea. It may also be used for tea or coffee in the solid form. This process, which is very old, has been recently patented. See MILK (*above*).

Milk of Roses. *Syn.* LAC ROSÆ, L. *Prep.* 1. (ENGLISH.)—*a.* Almonds (blanched), 1 oz.; oil of almonds and white soft soap, of each, 1 dr.; rose water, 1 pint; make an emulsion.

b. From liquor of potassa and oil of almonds, of each, 1 fl. oz.; hot water, 2 fl. oz.; agitate together until mixed, then add of rose water and distilled or filtered soft water, of each, ½ pint, and again agitate well.

c. As the last, but using half a teaspoonful of salt of tartar for the liquor of potassa.

d. (Redwood.) Blanched almonds, 8 oz.; rose water, 3 pints; make an emulsion, add of white Windsor soap, white wax, and oil of almonds, of each, ½ oz.; previously melted together by a gentle heat; triturate until united, and strain; lastly, add a solution of oil of bergamot, ½ oz.; oil of lavender, 1 dr.; and attar of roses, ½ dr.; (dissolved in) rectified spirit, 12 oz.

2. (FRENCH.)—*a.* From rose water, 1 quart; tinctures of benzoin and styrax, of each, 1 fl. oz.; spirit of roses, ½ fl. oz.; rectified spirit, 2 fl. oz.; mix.

b. (Augustin.) Tincture of benzoin, ½ fl. oz.; liquor of carbonate of potassa, 2½ fl. dr.; rose water, ½ pint; agitate well together. As a lotion in acne.

c. (Gianinni.) Tincture of benzoin, 1 dr.; tincture of balsam of Peru, 20 drops; rose water, 1 pint; as the last.

d. (Schubarth.) Almond paste, 3 drs.; rose water, ½ pint; tincture of benzoin, ½ fl. oz. As before. The addition to the last 3 of a little rectified spirit is an improvement.

3. (GERMAN.) From dilute solution of diacetate of lead (Goulard water), and spirit of lavender, of each, 1 fl. oz.; rose water, 6 fl. oz.; soft water, 1 pint.

Obs. All the above are used as cosmetic washes, and to remove scurf, pimples, and eruptions, in slight cases.

Sa'go Milk. *Syn.* LAC SAGO, L. *Prep.* (Dr. A. T. Thomson.) Sago, 1 oz.; cold water, 1 pint; macerate half an hour, pour off the water, add of milk, 1½ pint, and boil slowly until the sago is dissolved. Very nutritious; also in lieu of arrow-root milk.

Milk of Sulphur. See SULPHUR (Precipitated).

Vanil'la Milk. *Syn.* LAC VANILLÆ, L. *Prep.* 1. Essence of vanilla, 12 drops; lump sugar, 1 oz.; triturate, and add gradually, new milk, 1 pint.

2. (Beral.) Vanilla sugar, ½ oz.; milk, 16 oz.; dissolve.

MILK FEVER. *Syn.* FEBRIS LACTEA, L. A febrile condition of the system that sometimes occurs at the time the milk begins to be secreted after parturition. It often assumes a malignant character. See PUERPERAL FEVER.

MIL'LET. *Syn.* MILIUM, L. Several varieties of grain are known by this name. That commonly referred to under the name is the produce of *Panicum miliaceum* ('Indian millet'). The husked seeds (MILIUM MUNDATUM) are used to make gruel, and are ground for flour. 'Turkish millet,' or 'Guinea corn,' is produced by *Sorghum vulgare;* and the 'German' and 'Italian millet' by species of *Setaria.* In some parts of the world millet flour is used for bread, but it is chiefly cultivated as food for domestic animals.

MINCE MEAT. *Prep.* From stoned raisins, currants, sugar, and suet, of each, 2 lb.; sultana raisins and boiled beef (lean and tender), of each, 1 lb.; apples, 4 lbs.; juice of 2 lemons; the rind of 1 lemon, chopped very fine; mixed spice, ¼ lb.; candied citron and lemon peel, of each, 2 oz.; brandy, a glassful or two; the whole chopped very fine. It may be varied by adding other spice or flavouring, and by the addition of eggs, or the substitution of chopped fowl or veal for beef, according to the taste of the cuisinier.

MINDERE''RUS'S SPIRIT. See AMMONIA (Acetate of), and SOLUTION.

MIN'ERAL CHAME'LEON. *Prep.* From a mixture of binoxide of manganese and potassa and nitre, equal parts, heated to redness. It must be preserved in a well-corked bottle until required for use.

Prop., &c. When dissolved in water, its solution, at first green, passes spontaneously through all the coloured rays to the red, when, if potassa be added, the colour retrogrades until it reaches the original green. The addition of oil of vitriol, or of chlorine, renders the solution colourless. The addition of a weak acid, or even boiling or agitating the liquid, turns it from green to red. See MANGANIC ACID.

MIN'ERALIZERS. Substances which, by association with metallic bodies, deprive them of their usual properties, and impart to them the character of ores. Their removal belongs to metallurgy. The term MINERALIZED' has been applied to caoutchouc, gutta percha, bitumen, &c., which has been combined with sulphur, silica, or metallic matter.

MIN'IM. *Syn.* MINIMUM, L. A measured drop, of which 60 are equal to a fluid drachm. The size of drops vary so greatly with different liquids, and are also so much influenced by the size and shape of the vessels from which they are poured, that they afford no reliable measure of quantity for medicinal purposes. The poured drop has, in some cases, only ⅓rd the volume of the measured drop, or minim; whilst, in others, it is nearly 3 times as large. According to Mr. Durande, "liquids which contain a small proportion of water, afford a small drop; while, on the contrary, liquids containing a large quantity of water furnish a large drop." "Among liquids containing a large proportion of water, those which are not charged with remedial substances, give a larger and heavier drop than the same liquids when containing extraneous bodies in solution." In all cases in which the word 'drop' is mentioned in this work a minim is intended, and the quantity should be determined by means of a graduated minim measure.

MIN'IUM. See RED PIGMENTS.

MINT. *Syn.* SPEARMINT, GREEN M.; MENTHA VIRIDIS (Ph. L.), L. "The recent and the dried flowering herb" of *Mentha viridis*. It is aromatic and carminative, but its flavour is less agreeable than that of peppermint. It is employed in flatulence, colic, nausea, diarrhœa, &c.; also to make sauce.

MIR'RORS. See AMALGAM (Silvering), SILVERING, SPECULUM METAL, &c.

MITES. See ACARI.

MITH'RIDATE. *Syn.* DAMOCRATES'S CONFECTION; MITHRIDATIUM, CONFECTIO DAMOCRATIS, L. "This composition originally consisted of but few ingredients; viz., 20 leaves of rue, 2 walnuts, 2 figs, and a little salt. Of this we are informed that Mithridates took a dose every morning, to guard himself against the effects of poison. It was afterwards altered, and the number of the ingredients increased to sixty-one. In this more complex form it contained opium, and was, in effect, an aromatic opiate, of which the confection of opium of the present day may be considered as a simplification. The 'mithridate' is still prepared in some shops, and is occasionally, though very rarely, prescribed." (Med. Lex.) "The formulæ for CONFECTION OR ELECTUARY OF CATECHU may be considered as the representatives, in our modern Pharmacopœias, of the once celebrated recipes for CONFECTIO DAMOCRATIS and THERIACA ANDROMACHI." (Redwood.) Mithridate was formerly conceived to be good for nearly every disease, and an antidote for every known poison.

MIX'TURE. *Syn.* MISTURA, L. A compound liquid medicine, taken in divided doses.

Mixtures are usually extemporaneous preparations, and in prescribing them care should be taken not to bring together substances that decompose each other, nor to order heavy powders, that speedily separate from the body of the liquid by subsidence. EMULSIONS, JULEPS, and MUCILAGES, are included in the 'MISTURÆ' of the London Pharmacopœia.

Mixtures are usually dispensed in flat octagonal 6 or 8-oz. bottles, with long necks; or in regular 'octagons,' with short necks, having the doses marked on the glass, to which the strength of the medicine is made to correspond.

Our remarks respecting 'DRAUGHTS' equally apply here. By putting the active ingredients of six draughts into a 6-oz. mixture bottle, and filling it up with distilled water, a mixture will be made of corresponding properties, of which the dose will be 2 table-spoonfuls. When the formula for the draughts includes a decoction or infusion as the vehicle, instead of water, four of them only must be taken, which will then fill the 6-oz. bottle, and the proper *dose* will be 3 table-spoonfuls, or a small wine-glassful.

The following formulæ embrace the whole of the 'MISTURÆ' of the British Pharmacopœias, as well as a few others in general use. These will serve as examples for the like preparations of medicinals which are not included in the list. (See also DRAUGHT, EMULSION, JULEP, WATER, &c.)

Mixture, Absor'bent. See ANTACID MIXTURE.

Mixture, Aca'cia. See GUM MIXTURE.

Mixture, Ace'tate of Ammo"nia. *Syn.* MINDERERUS'S MIXTURE; MISTURA AMMONIÆ ACETATIS, L. *Prep.* From solution of acetate of ammonia, 1½ fl. oz.; nitre, 40 grs.; camphor mixture, 6 fl. oz.; rose syrup, ½ fl. oz.—*Dose.* 1 to 3 table-spoonfuls, every third or fourth hour, as a diaphoretic in inflammatory fevers, &c.

Mixture, Al'kaline. See ANTACID MIXTURE.

Mixture, Al'mond. *Syn.* EMULSION OF ALMONDS, MILK OF A.; MISTURA AMYGDALÆ (B. P., Ph. L. E. & D.), LAC AMYGDALÆ, L. *Prep.* 1. (Ph. L.) Confection of almonds, 2½ oz.; distilled water, 1 pint; gradually add the water to the confection while triturating, until they are mixed; then strain the liquid through linen.

2. (Ph. E.) From almond confection, 2 oz., and water, 1 quart; as the last. Or, from sweet almonds (blanched), 10 drs.; white sugar, 5 drs.; mucilage, ½ fl. oz. (or powdered gum, 3 drs.); made into an emulsion with water, 1 quart.

3. (Ph. D.) Sweet almonds (blanched), 5 drs.; refined sugar, 2 drs.; powdered gum, 1 dr.; distilled water, 8 fl. oz.; as the last.

4. (B. P.) Compound powder of almonds (sweet), 1; water, 8; triturate and strain.

Obs. The last formula produces the article usually employed in dispensing in the shops. The addition of a little more sugar renders it more pleasant; and 2 or 3 bitter almonds, as in the formula of the Ph. D. 1826, or 1 or 2 fl. drs. of rose or orange-flower water, may occasionally be added, to diversify the flavour.—*Dose.* 2 or 3 table-spoonfuls, *ad libitum*; as a demulcent and emollient in coughs and colds, or as a vehicle for more active medicines.

Mixture, Ammoni'acum. *Syn.* EMULSION OF AMMONIACUM, MILK OF A.; MISTURA AMMONIACI (B. P., Ph. L. & D.), LAC AMMONIACI, L. *Prep.* 1. (Ph. L.) Prepared ammoniacum, 5 drs.; distilled water, 1 pint; rub the ammoniacum with the water, gradually added, until they are perfectly mixed.

2. (Ph. D.) Ammoniacum, ¼ oz.; water, 8 fl. oz.; as the last, but straining through muslin.

3. (B. P.) Ammoniacum, ¼ oz.; rubbed down with water, 8 oz., and strain.—*Dose.* ½ to 1 gr.

Obs. The last formula produces the best and most effective mixture, owing to the use of the raw instead of the strained drug.—*Dose.* 1 to 2 table-spoonfuls, either alone or combined with squills or ipecacuanha; as an expectorant and demulcent in chronic coughs, humoral asthma, &c.

Mixture, A′nodyne. *Syn.* MISTURA ANODYNA, JULEPUM CALMANS, L. *Prep.* 1. Prepared chalk, 2 drs.; syrup of poppies, 1 oz.; fetid spirit of ammonia, 1½ dr.; oils of dill and aniseed, of each, 3 drops; water, 4½ fl. oz.—*Dose.* A teaspoonful 3 or 4 times a day; in the diarrhœa and colic of infancy.

2. (P. Cod.) Syrup of opium, 2 drs.; syrup of orange flowers, 6 drs.; lettuce water, 4 fl. oz. To allay pain, induce sleep, &c. *Dose.* 1 table-spoonful.

3. (Vicat.) Ammoniated alcohol, ¾ fl. oz.; powdered opium, 1 dr.; powdered camphor, ½ dr.; proof spirit, 1½ fl. oz.; digest, with agitation, for 3 or 4 days, and filter. In toothache arising from caries, and as a lotion to the temples in headache.

Mixture, Anti-emet′ic. *Syn.* MISTURA ANTIEMETICA, L. *Prep.* 1. Creasote, 12 drops; acetate of morphia, 1½ gr.; camphor, 10 grs.; rectified spirit, ½ fl. oz.; syrup of orange peel, 1½ fl. oz.; distilled vinegar, 4 fl. oz In seasickness, &c.—*Dose.* 1 table-spoonful on the approach of vomiting, and repeated at intervals of ½ an hour until the vomiting ceases.

2. (Dr. Barker.) Compound tincture of camphor, 1 fl. dr.; burnt brandy, 1 fl. oz.; sugar, ½ oz.; infusion of mint, 6 fl. oz.—*Dose.* ½ to 1 table-spoonful, every ¼ hour, until the vomiting ceases.

Mixture, Antac′id. *Syn.* ABSORBENT MIXTURE, ALKALINE M.; MISTURA ALKALINA, M. ANTACIDA, L. *Prep.* 1. Liquor of potassa and spirit of nutmeg, of each, 2 fl. drs.; tincture of rhubarb, 3 fl. drs.; tincture of opium, 1 fl. dr.; water, 5 fl. oz. In dyspepsia, heartburn, &c., accompanied with flatulence.

2. Spirit of sal volatile and orange-flower water, of each, 1 fl. oz.; simple syrup, 1½ fl. oz.; water, 2½ fl. oz. In acidity, &c., accompanied with languor and low spirits.

3. Sesquicarbonate of ammonia, 2 drs.; syrup of orange peel and tincture of gentian, of each, 1 fl. oz.; water, 4 fl. oz. In dyspepsia, heartburn, &c., arising from excessive indulgence in spirituous or fermented liquors. It also possesses considerable stimulating properties, and will partially remove the fit of drunkenness.

4. (Collier.) Prepared chalk, 2 drs.; tincture of ginger, 2 fl. drs.; compound tincture of cardamoms, 1½ fl. oz.; pimento water, 6 fl. oz. In diarrhœa accompanied with acidity.

5. (Collier.) Chalk mixture, 5 fl. oz. tinctures of catechu and cinnamon, of each, ½ fl. oz. In chronic diarrhœa.

6. (Ryan.) Liquor of potassa, 2 fl. dr.; tincture of opium, 1 fl. dr.; calcined magnesia, 1 dr.; oil of peppermint, 5 drops; lime water, 8 fl. oz. In dyspepsia accompanied with acidity, flatulence, and constipation.

Mixture, Anticroup′al. *Syn.* MISTURA SENEGÆ, L. *Prep.* (Jadelot.) Infusion of senega, 4 oz.; syrup of ipecacuanha, 1 oz.; oxymel of squills, 3 drs.; tartarized antimony 1½ gr.; mix. By spoonfuls, in croup.

Mixture, Anti-epilep′tic. *Syn.* MISTURA ANTI-EPILEPTICA, L. *Prep.* (M. Lemoine.) Liquor of ammonia, 12 drops; syrup of orange flowers, 1 oz.; distilled water of linden flowers, 2 oz.; do. of cherry laurel, ½ oz.; mix. According to M. Lemoine, this is a specific in epilepsy. —*Dose.* 1 table-spoonful, or more.

Mixture, Antihyster′ic. *Syn.* MISTURA ANTIHYSTERICA, L.; POTION ANTIHYSTERIQUE, Fr. *Prep.* (Dr. Josat.) Cyanide of potassium, 1¾ gr.; distilled lettuce water, 4½ fl. oz.; syrup of orange flowers, 1½ fl. oz.—*Dose.* 1 or 2 teaspoonfuls every ten minutes, when the fit is expected; during the fit it may be given in double doses. Dr. Josat declares its efficacy to have been indisputably proved, in upwards of 55 cases.

2. (Magendie.) Cyanide of potassium, 2 grs.; lettuce water (distilled), 4 oz.; syrup of marshmallow, 2 oz. Resembles the last.

3. (Dr. Paris.) Assafœtida, 1 dr.; peppermint water, 5 fl. oz.; make an emulsion, and add of ammoniated tincture of valerian, 2 fl. drs.; tincture of castor, 3 fl. drs.; sulphuric ether, 1½ fl. dr.—*Dose.* 1 table-spoonful, 3 or 4 times a day, or oftener.

4. (P. Cod.) Syrup of wormwood, 1 oz.; tincture of castor, ½ dr.; valerian water and orange-flower water, of each, 2 oz.; ether, 1 dr. As the last.

Mixture, Antimo″nial. See CONTRA-STIMULANT MIXTURE.

Mixture, Antipertus′sic. *Syn.* MISTURA ANTIPERTUSSIENS, L. *Prep.* 1. COCHINEAL (powdered), 2 drs.; carbonate of potassa, 1 dr.; boiling water, 8 fl. oz.; infuse for 1 hour, strain, and add of lump sugar, 1½ oz.

2. (Dr. Bird.) Extract of hemlock, 12 grs.; alum, 25 grs.; syrup of red poppies, 2 fl. drs.; dill water, 3 fl. oz.

3. (Dr. Reece.) Tincture of assafœtida, 1 fl. dr.; tincture of opium, 10 or 12 drops; powdered ipecacuanha, 10 grs.; water, 2 fl. oz. —*Dose.* A teaspoonful every 3 hours, in hooping cough, for a child 2 or 3 years old, and other ages in proportion,

Mixture, Antiscrof′ulous. *Syn.* MISTURA ANTISCROFULOSA, L. *Prep.* From tincture of bichloride of gold, 30 drops; tincture of iodine, 40 drops; tincture of gentian, 1 fl. dr.; simple syrup, 7 fl. drs.; rose water, 5 fl. oz.—*Dose.* A dessert-spoonful, 3 or 4 times daily, in a wineglassful of water; observing to shake the bottle before pouring out the liquid. Mr. Cooley states that he has seen repeated instances of the excellent effects of this medicine in scrofula, syphilis, and various glandular diseases, even under all the disadvantages of a salt-meat diet and confinement on shipboard.

Mixture, Antispasmod′ic. *Syn.* MISTURA ANTISPASMODICA, L. *Prep.* 1. Tincture of castor, 6 fl. drs.; sulphuric ether and laudanum, of each, 1 fl. dr.; syrup of saffron, 1 fl. oz.; cinnamon water, 4 fl. oz.

2. (Dr. Collier.) Assafœtida and camphor mixtures, of each, 2½ fl. oz.; tincture of valerian, 1 fl. oz.

3. (P. Cod.) Lime or linden-flower water and orange-flower water, of each, 2 oz.; syrup of orange flowers, 1 oz.; ether, ½ dr.—*Dose.* (Of each of the above) 1 to 2 table-spoonfuls.

Mixture, Ape″rient. *Syn.* MISTURA APERIENS, L. *Prep.* 1. (Abernethy.) Sulphate of magnesia, 1 oz.; manna, ½ oz.; infusion of senna, 1½ fl. oz.; tincture of senna, ½ fl. oz.; mint water, 2 fl. oz.; distilled water, 4 fl. oz.; mix. This is the true 'ABERNETHY BLACK DRAUGHT.'

2. (Dr. Christison.) Sulphate of magnesia, 1½ oz.; water, 4 fl. oz.; dissolve, and add, of tincture of senna, 1 fl. oz.; infusion of roses, 4 fl. oz.—*Dose.* A wine-glassful hourly, until it begins to operate.

3. (Dr. Collier.) Sulphate of iron, 20 grs.; Epsom salt, 1 oz.; pennyroyal water, 1 pint; dissolve.—*Dose.* A wine-glassful twice a day, in atonic amenorrhœa.

Mixture, Aromat′ic. *Syn.* MISTURA AROMATICA, L. *Prep.* 1. (P. Cod.) Syrup of clove gillyflowers, 1 oz.; spirit of cinnamon, ½ oz.; confection of hyacinth, 2 drs.; peppermint water and orange-flower water, of each, 2 oz.

2. (Guy's Hosp.) Aromatic confection (Ph. L., in powder), 3 drs.; peppermint water, 9 fl. oz. Sometimes a little tincture of calumba is added.

3. (St. B. Hosp.) Aromatic confection, 2½ drs.; water, 5 fl. oz.; pimento water, 3 fl. oz.; mix. The last two are excellent aromatic absorbents in diarrhœa, heartburn, flatulence, acidity, &c.—*Dose.* 1 or 2 table-spoonfuls every 2 or 3 hours, or as required.

Mixture, Aromatic Iron. Pale bark, in powder, 4; calumba, in powder, 2; cloves, bruised, 1; iron wire, 2; compound tincture of cardamoms, 12; tincture of orange peel, 2; peppermint water, 50; macerate the first four ingredients in the last one for three days, agitating occasionally, filter, add the tinctures, and make up to 50. *Used* as a tonic.—*Dose.* 1 to 2 oz.

Mixture, Arsen′ical. *Syn.* MISTURA ARSENICALIS, L. *Prep.* From liquor of arsenite of potassa—Ph. L., 2 fl. drs.; compound tincture of cardamoms, 4 fl. drs.; cinnamon water, 2 fl. oz.; pure water, 3 fl. oz.; mix.—*Dose.* A small table-spoonful, twice a day, after a full meal; in agues, periodic headaches, lepra, psoriasis, chronic rheumatism, &c. It should be exhibited with caution, and its effects watched; and after 5 or 6 days the dose should be reduced to half the quantity.

Mixture, Astrin′gent. *Syn.* MISTURA ASTRINGENS, L. *Prep.* 1. (Pradel.) Tannin, 12 grs.; tincture of rhatany, 1 dr.; simple syrup, 7 drs.; mucilage, 1 oz.; camphor mixture, 4 oz.

2. (A. T. Thomson.) Extract of catechu, 2 drs. (or tincture, 1 oz.); cinnamon water, 8 oz.; dissolve.—*Dose.* 1 to 3 table-spoonfuls, after every liquid dejection, in diarrhœa and dysentery.

Mixture, Atroph′ic. *Syn.* MISTURA ATROPHICA, L.; POTION ATROPHIQUE, Fr. *Prep.* (Magendie.) Iodide of potassium, 4 drs.; lettuce water, 8 oz.; peppermint water, 2 drs.; syrup of marsh-mallow, 1 oz.—*Dose.* 1 table-spoonful, twice a day; in hypertrophy (enlargement) of the heart. Sometimes 1 to 2 drs. of tincture of foxglove is added to the mixture.

Mixture, Bar′ley. *Syn.* MISTURA HORDEI, L. See DECOCTION.

Mixture, Brandy. *Syn.* MIXTURE OF SPIRIT OF FRENCH WINE, EGG FLIP‡; MISTURA SPIRITUS VINI GALLICI (B. P., Ph. L.), L. *Prep.* 1. (Ph. L.) Brandy and cinnamon water, of each, 4 fl. oz.; yolks of 2 eggs; white sugar, ½ oz; oil of cinnamon, 2 drops; mix. A valuable stimulant and restorative, in low fevers, and in extreme exhaustion from hæmorrhages, &c.; but scarcely a fitting subject for the labours of the College of Physicians, since almost every cook and housewife could produce a better compound than the product of the College formula.

2. (B. P.) Brandy, 4 grs.; cinnamon water, 4 oz.; the yolks of 2 eggs; sugar, ½ oz.; mix. —*Dose.* ½ to 1½ oz., in prostration and last stages of fever.

Mixture, Cam′phor. *Syn.* CAMPHOR JULEP, CAMPHOR WATER; MISTURA CAMPHORÆ (Ph. L. & D.), EMULSIO CAMPHORÆ (Ph. E.), MISTURA CAMPHORATA, L. *Prep.* 1. (Ph. L.) Camphor, ½ dr.; rectified spirit, 10 drops; triturate together, gradually adding of water, 1 pint; and strain through linen.

2. (Ph. D.) Tincture of camphor, 1 fl. oz.; distilled water, 3 pints; agitate well together, and after 24 hours filter through paper.

3. (Ph. E.) See EMULSION.

Uses, &c. Camphor julep is chiefly used as a vehicle for other medicines.—*Dose,* ½ to 1 wine-glassful.

4. (With MAGNESIA: MISTURA CAMPHORÆ CUM MAGNESIA—Ph. E. & D., AQUA CAMPHORÆ —Ph. U. S.)—*a.* (Ph. E.) Camphor, 10 grs., carbonate of magnesia, 25 grs.; triturate together, then gradually add of water, 6 fl. oz., still continuing the trituration.

b. (Ph. D.) Camphor, 12 grs.; carbonate of magnesia, ½ dr.; water, 6 fl. oz.; as last.

c. (Ph. U. S.) Camphor, 2 drs.; rectified spirit, 40 drops; triturate, add of carbonate of magnesia, 4 drs., and again triturate, adding, gradually, of water, 32 fl. oz. Antacid, antispasmodic, and anodyne.—*Dose.* 1 to 2 table-spoonfuls. Used without straining. It is stronger than the simple mixture.

Mixture, Carmin'ative. *Syn.* MISTURA CARMINATIVA, L. *Prep.* (Dr. Paris.) Calcined magnesia, ½ dr.; peppermint water, 2½ fl. dr.; compound tincture of lavender, ½ fl. dr.; spirit of caraway, 4 fl. drs.; syrup of ginger, 2 fl. drs.; mix. Antacid and carminative. For 1 or 2 doses.

Mixture, Cathar'tic. See APERIENT MIXTURE, SENNA M., &c.

Mixture, Chalk. *Syn.* CRETACEOUS MIXTURE; MISTURA CRETÆ (B. P.); MISTURA CRETA (Ph. L. E. & D.); M. CRETACEA, L. *Prep.* 1. (Ph. L.) Prepared chalk, ½ oz.; sugar, 3 drs.; mixture of acacia (mucilage), 1½ fl. oz.. triturate together, then add of cinnamon water, 18 fl. oz.

2. (Ph. E.) Prepared chalk, 10 drs.; white sugar, 5 drs.; mucilage, 3 fl. oz.; spirit of cinnamon, 2 fl. oz.; water, 1 quart; as the last.

3. (Ph. D.) Prepared chalk, 2 drs.; syrup and mucilage, of each, ½ oz.; cinnamon water, 7 fl. oz.

4. (B. P.) Prepared chalk, 1; gum arabic, in powder, 1 ; syrup, 2; cinnamon water, 30; mix by trituration.—*Dose.* 1 to 2 grs., with astringent tinctures and opium.

Obs. The above are antacid and absorbent. —*Dose.* 1 to 3 table-spoonfuls, either alone or combined with aromatic confection; in heartburn, and in diarrhœa after every liquid motion. In the latter affection, a little tincture of catechu or laudanum is often added; and when there is vomiting or nausea, either peppermint or spearmint water is generally substituted for the whole or a part of the simple water ordered in the above formulæ.

Mixture, Cincho'na. *Syn.* BARK MIXTURE; MISTURA CINCHONÆ, L. *Prep.* (Copland.) Confection of roses, ½ oz.; boiling decoction of bark, 1 fl. oz.; triturate, in 10 minutes strain, and add diluted sulphuric acid, 1½ fl. dr.; spirit of nutmeg, 4 fl. drs. Febrifuge, tonic, and stomachic. *Dose.* 1 to 3 table-spoonfuls, 2 or 3 times a day.

Mixture, Col'chicum. *Syn.* GOUT MIXTURE; MISTURA ANTARTHRITICA, M. COLCHICI, L. *Prep.* (Sir C. Scudamore.) Magnesia, 1½ dr.; vinegar of colchicum and syrup of orange peel, of each, 4 fl. drs.; peppermint water, 3 fl. oz. A table-spoonful every 3 or 4 hours during the fit of gout.

Mixture, Contra-stim'ulant. *Syn.* MISTURA CONTRA-STIMULANS, JULEPUM C., M. ANTIMONII POTASSIO-TARTRATIS, L. *Prep.* (Laennec.) Tartar emetic, 3 grs.; infusion of orange leaves, 8 fl. oz.; syrup of do., 1 fl. oz.—*Dose.* A wine-glassful, or more, every 2 hours; in inflammation of the lungs, hooping cough, &c.

Mixture, Cough. *Syn.* MISTURA BECHICA, L. *Prep.* 1. Almond mixture, 4 fl. oz.; oxymel of squills, 1 fl. oz.; ipecacuanha wine and syrup of tolu, of each, ½ fl. oz.

2. Tincture of tolu, ½ fl. oz.; paregoric elixir and tincture of squills, of each, 1 fl. oz.; syrup of poppies, 2 fl. oz.; water, 3½ fl. oz.

3. Mixture of ammoniacum; 4 fl. oz.; syrup of squills, 2 fl. oz. In the coughs of old persons.

4. Antimonial wine, 3 fl. drs.; syrup of poppies, 1½ fl. oz.; water, 4 fl. oz. In dry, husky coughs.—*Dose.* (of each of the above), 1 table-spoonful, 2 or 3 times a day, or oftener.

5. (Dr. Monro. Paregoric, ½ fl. oz.; sulphuric ether and tincture of tolu, of each, ½ oz. —*Dose.* A teaspoonful, in water, night and morning, or when the cough is troublesome.

6. (Dr. Radcliff.) Syrup of poppies, syrup of squills, and paregoric, equal parts.—*Dose.* As the last. In all cases the bowels should be kept gently moved by some mild aperient.

Mixture, Cre'asote. *Syn.* MISTURA CREASOTI, M. CREAZOTI (B. P., Ph. E.), L. *Prep.* 1. (Ph. E.) Creasote and acetic acid, of each, 16 drops; mix, then add of compound spirit of juniper and syrup, of each, 1 fl. oz.; water, 14 fl. oz.; and agitate well together.—*Dose.* ½ to 1 wine-glassful, in nausea and vomiting, especially to prevent or relieve sea-sickness.

2. (B. P.) Creasote, 16 minims; glacial acetic acid, 16 minims; spirit of juniper, ½ dr.; syrup, 1 oz.; distilled water, 15 oz.; mix.—1 to 2 oz.

Mixture, Demul'cent. *Syn.* MISTURA DEMULCENS, L. See ALMOND MIXTURE, GUM M., &c.

Mixture, Diaphoret'ic. *Syn.* MISTURA DIAPHORETICA, L. *Prep.* 1. Solution of acetate of ammonia, 3 fl. oz.; antimonial wine, 2 fl. drs.; tincture of henbane, 1½ fl. dr.; camphor mixture, 3 fl. oz.—*Dose.* 1 table-spoonful every 3 or 4 hours; in fevers, &c.

2. To the last add of sweet spirit of nitre, ½ fl. oz. As above.

Mixture, Diarrhœ'a. See CHALK MIXTURE, &c.

Mixture, Diuret'ic. *Syn.* MISTURA DIURETICA, L. *Prep.* 1. Nitrate of potassa, 2 drs.; sweet spirit of nitre, 3 fl. dr.; syrup of squills, 1½ fl. oz.; peppermint water, 4 fl. oz.

2. (A. T. Thomson.) Infusion of foxglove, 5½ fl. oz.; tincture of foxglove, ½ fl. dr.; acetate of potassa, 2 drs.; spirit of juniper, ½ fl. oz.; tincture of opium, ½ fl. dr. In dropsy. *Dose.* 1 to 2 table-spoonfuls, every 2 or 3 hours. The last must be used with caution.

Mixture, Emet'ic. *Syn.* MISTURA EMETICA, L. *Prep.* 1. (Copland.) Sulphate of zinc, 40 grs., ipecacuanha wine and tincture of serpentary, of each, 4 fl. drs.; tincture of capsicum, 40 drops; oil of chamomile, 12 drops; peppermint water, 4½ fl. oz. As an excitant emetic; in cases of poisoning by narcotics, &c.

2. (Magendie.) Coloured emetine, 4 grs. (or white emetine, 1 gr.); acetic acid, 8 drops; mix, and add of infusion of orange leaves or lime flowers, 3½ fl. oz.; syrup of marsh-mallows, 1 fl. oz.

3. (A. T. Thomson.) Ipecacuanha, ½ dr.; tartar emetic, 1 gr.; tincture of squills, 1 fl.

dr.; water, 6 fl. oz. *Dose.* 1 to 2 table-spoonfuls, followed by half the quantity every 10 or 15 minutes, until vomiting is produced; at the same time assisting the action of the medicine by drinking copiously of warm water.

Mixture, Emmen'agogue. See STEEL MIXTURE, &c.

Mixture, Expec'torant. *Syn.* MISTURA EXPECTORANS, L. *Prep.* 1. (Collier.) Oxymel of squills and mucilage, of each, 1 oz.; syrup of marsh-mallows, 2 oz.; camphor julep, 3 fl. oz. —*Dose.* 1 to 2 table-spoonfuls, 2 or 3 times a day; in coughs, hoarseness, asthma, &c.

2. (A. T. Thomson.) Almond mixture, 5 fl. oz.; ipecacuanha wine and tincture of squills, of each, 1 fl. dr.; syrup of tolu, 6 fl. drs.—*Dose.* 1 table-spoonful; in humoral asthma, catarrh, &c., when the cough is urgent.

Mixture, Feb'rifuge. *Syn.* MISTURA FEBRIFUGA, L. See ACETATE OF AMMONIA MIXTURE, DIAPHORETIC M., &c.

Mixture, Gentian (Compound). Gentian, bruised, 1½; bitter orange peel, bruised, ¾; cardamom seeds, bruised, ¼; proof spirit, 20: macerate for forty-eight hours with 15 of the spirit, agitating occasionally, pack in a percolator, let it drain, and then pour on the remaining spirit; when it ceases to drop, wash the marc with spirit to make up 20.—*Dose.* 1 to 2 drachms.

Mixture, Gregory's. See POWDERS.

Mixture, Griffith's. See STEEL MIXTURE.

Mixture, Guai'acum. *Syn.* EMULSION OF GUAIACUM, MILK OF G.; MISTURA GUAIACI (B. P.), (Ph. L. & E.), LAC G., L. *Prep.* (Ph. L.) Gum guaiacum, 3 drs.; white sugar, ½ oz.; gum acacia, 2 drs. (all in powder); triturate together, and to these, whilst rubbing, gradually add of cinnamon water, 1 pint.

2. (Ph. E.) Guaiacum, 3 drs.; sugar, ½ oz.; mucilage, ½ fl. oz.; cinnamon water, 19½ fl. oz.; as before.—*Dose.* 1 to 3 table-spoonfuls, 2 or 3 times a day; in chronic rheumatism, gout, &c.

3. (B. P.) Guaiac resin, in powder, 2; sugar, 2; gum arabic, in powder, 1; cinnamon water, 80; triturate, adding the cinnamon water gradually.—*Dose.* ½ to 2 oz.

Mixture, Gum. *Syn.* MUCILAGE; MISTURA ACACIÆ (Ph. L.), MUCILAGO (Ph. E.), MUCILAGO ACACIÆ (Ph. D.), MUCILAGO ARABICI GUMMI, L. *Prep.* 1. (Ph. L.) Gum acacia (in powder), 13 oz.; boiling distilled water, 1 pint; rub the gum with the water, gradually poured in, until solution is complete.

2. (Ph. E.) Gum, 9 oz.; cold water, 1 pint; macerate, with occasional stirring, until dissolved, then strain through linen or calico.

3. (Ph. D.) Gum (coarsely powdered), 4 oz.; water (cold), 6 fl. oz.; dissolve, and strain through flannel.

Uses, &c. Mucilage of gum acacia is chiefly employed to render oily and resinous substances miscible with water. "Oils require about ¾ their weight; balsams and spermaceti, equal parts; resins, 2 parts; and musk, 5 times its weight," for this purpose. (Montgomery.) The GUM MIXTURE, Ph. E., will be found under 'EMULSION.'

Mixture, Hydrocyan'ic. *Syn.* MIXTURE OF PRUSSIC ACID; MISTURA ACIDI HYDROCYANICI, L. *Prep.* From medicinal prussic acid, 15 drops; simple syrup (pure), 1 fl. oz.; distilled water, 5 fl. oz.—*Dose.* 1 table-spoonful, 2 or 3 times daily. Each dose contains 1¼ drop of medicinal prussic acid. The bottle should be shaken before pouring out the dose. Magendie's formulæ for this mixture are omitted, because the acid which he orders is not kept in the shops in England.

Mixture, I'ron. See STEEL MIXTURE.

Mixture, I'ron (Compound). See STEEL MIXTURE.

Mixture, Marsh-mallow. *Syn.* MISTURA ALTHÆÆ (Ph. E.), L. *Prep.* (Ph. E.) Marsh-mallow root (dried), 4 oz.; stoned raisins, 2 oz.; water, 5 pints; boil to 3 pints, strain through linen, and after the sediment has subsided, decant the clear portion.

2. (Ph. D.) See DECOCTION. Demulcent.—*Dose.* A few spoonfuls *ad libitum*, so as to take 1 to 3 pints in the 24 hours; in strangury, calculus, coughs, fevers, &c.

Mixture, Myrrh. *Syn.* EMULSION OF MYRRH; MISTURA MYRRHÆ, L. *Prep.* (Copland.) Myrrh, 1½ dr.; add to it gradually, triturating all the time, decoction of liquorice, 6 fl. oz., and strain.—*Dose.* 1 to 2 table-spoonfuls, twice or thrice a day, combined with carbonate of soda, dilute hydrochloric acid, or paregoric; in debility, and diseases of the digestive organs.

Mixture, Narcot'ic. *Syn.* MISTURA NARCOTICA, M. FEBRIFUGA, L. *Prep.* 1. Tincture of henbane, 2 fl. drs.; solution of acetate of ammonia, 3 fl. oz.; water, 2¾ fl. oz.; mix.—*Dose.* 1 to 2 table-spoonfuls, to relieve pain, procure sleep in fevers, &c.

2. (W. Cooley.) Laudanum, 1½ fl. dr.; syrup of poppies, sulphuric ether, and spirit of cinnamon, of each, 1 oz.; tincture of henbane, 2½ fl. dr.; tincture of capsicum, 4 fl. drs.; water, 2 fl. oz.—*Dose.* 1 to 2 table-spoonfuls, at the commencement of the hot fit of ague.

Mixture, Oleo-balsam'ic. *Syn.* MISTURA OLEO-BALSAMICA, L.. *Prep.* (Hamb. Cod.) Oils of cedrat, cinnamon, cloves, lavender, mace, and marjoram, of each, 20 drops; oil of rue, 10 drops; balsam of Peru, ½ dr.; rectified spirit, 10 oz.; digest and filter.

Mixture, Pur'gative. *Syn.* MISTURA CATHARTICA, M. LAXATIVA, M. PURGANS, L. *Prep.* 1. From any of the purging salts (Epsom, Glauber, tasteless, &c.), 2 oz.; infusion of senna, 5 fl. oz.; syrup of orange peel, 1 fl. oz.; tincture of ginger, ½ fl. oz.; spirit of pimento, 2 fl. drs.; mix.—*Dose.* 1 to 3 table-spoonfuls, early in the morning; as an aperient in stomach complaints, &c.

2. (Dr. Copland.) Manna, 1½ oz.; cream of tartar, ½ oz.; whey, 1 quart. By wine-glassfuls, as an aperient drink, in fevers, &c.

3. (Corvisart.) Borotartrate of potassa (soluble tartar), 1 oz.; tartar emetic, ½ gr.; sugar, 2 oz.; water, 1½ pint; dissolve. By wine-glassfuls, until it begins to operate. This has been called '**Napoleon's medicine**,' from its having been frequently taken by Napoleon I. See **Mixtures of Scammony, Senna**, &c.

Mixture, Saline. *Syn.* **Mistura salina**, L. See **Draught** and **Lemonade**.

Mixture, Scam'mony. *Syn.* **Scammony milk**; **Mistura scammonii** (B. P.), L. *Prep.* 1. (Ph. E.) Resin of scammony, 7 grs.; unskimmed milk, 3 fl. oz.; gradually mix, triturating all the time, so as to form an emulsion. Purgative.—*Dose.* One half.

2. (Planche's **Purgative Potion.**) To the last add of white sugar, ¼ oz.; cherry-laurel (or bitter-almond) water, 4 or 5 drops. The above are the most tasteless and pleasant purgatives of an active character known.

3. (B. P.) Resin of scammony, 4 grs.; fresh milk, 2 oz.; triturate and form an emulsion.—*Dose.* The quantity of the formula for an adult, half for a child.

Mixture, Sen'na (Compound). *Syn.* **Black draught, Abernethy's d., Cathartic mixture**; **Mistura sennæ composita** (B. P.), L. *Prep.* 1. Infusion of senna, ¾ pint; tincture of senna, 1½ fl. oz.; Epsom salts, 4 oz.; carbonate of ammonia, ½ dr.; sugar, 3 oz. agitate until the solids are dissolved.

2. Senna, 13 oz.; boiling water, 2 quarts; digest for 4 hours in a hot place, then press out the liquor in a tincture press, and add, of compound tincture of senna, ¾ pint; Epsom salts, 1 lb.

3. East India senna, 2 lb.; boiling water, 9 quarts; tincture of senna and Epsom salt, of each, 3¼ lb.; as the last.

4. Senna, 8 lbs.; boiling water, 9 galls.; Epsom salt, 16 lbs.; tincture of senna, 1½ galls.; treacle and colouring, of each, 1 quart.

5. (Guy's Hosp.) Senna and mint, of each, 1¼ oz. (say, 1½ oz.); boiling water, 1 quart; Epsom salt, 7½ oz. (say, ½ lb.).

6. (Redwood.) Infusion of senna, 18 oz.; tincture of senna, 3 oz.; sulphate of magnesia, 6 oz.; extract of liquorice and spirit of sal volatile, of each, ¾ oz.; oil of cloves, 6 drops.

7. (B. P.) Infusion of senna, 14; sulphate of magnesia, 4; extract of liquorice, ½; tincture of senna, 2½; compound tincture of cardamoms, 1¼: dissolve and mix.—*Dose.* 1 to 1½ oz.

Obs. As the above mixture contains very little spirit, and from its great consumption, being made in large quantities at a time, it frequently spoils before the whole is sold, especially in hot weather. To avoid this, 1½ dr. of cloves and 3 drs. of mustard seed, both bruised, may be added to every gall. of the strained liquor at the same time with the salts, spirit, and colouring, after which it must be shaken up repeatedly for a few days, and then allowed to repose for a few days more, when it will become quite clear. It may be filtered through a flannel bag, but there is much loss and delay, owing to the consistence of the liquid. It is purgative in doses of 1 to 1½ fl. oz.

It is a singular circumstance, that although an enormous quantity of this preparation is consumed in these countries, there is no standard formula for it in the British Pharmacopœias. See **Aperient Mixture**, &c.

Mixture, Steel. *Syn.* **Mistura Ferri Composita** (B. P.), **Mistura chalybeata**, L. Two compounds of this class are officinal:—

1. (**Griffith's mixture, Compound iron m.**; **Mistura ferri, M. f. protoxydi, M. f. composita**—Ph. L. E. & D.) *Prep.*—*a.* (Ph. L. & E.) Carbonate of potassa, 1 dr.; powdered myrrh, 2 drs.; spirit of nutmeg, 1 fl. oz.; triturate together, and whilst rubbing, add gradually, of sugar, 2 drs.; rose water, 18 fl. oz.; mix well; then add of sulphate of iron (powdered), 50 grs., and place it at once in a bottle, which must be kept closely corked.

b. (Ph. D.) Powdered myrrh and sugar, of each, 1 dr.; carbonate of potassa, ½ dr.; essence of nutmeg, 1 fl. dr.; rose water, 7 fl. oz.; sulphate of iron, ½ dr.; (dissolved in) rose water, 1 fl. oz.—*Dose.* 1 to 2 oz., 3 or 4 times a day, as a mild and genial chalybeate tonic and stimulant; in amenorrhœa, chlorosis, debility, &c., when there is no determination of blood to the head.

2. (**Heberden's mixture, H.'s ink**; **Atramentum Heberdii**; **Mistura ferri aromatica**—Ph. D.) Pale cinchona bark, 1 oz.; calumba root, 3 drs.; (both in coarse powder;) cloves (bruised), 2 drs.; iron filings, ½ oz.; peppermint water, 16 fl. oz.; digest in a close vessel for 3 days, agitating frequently, then strain, and add of tincture of cardamoms (comp.), 3 fl. oz.; tincture of orange peel, 3 fl. dr. Bitter, stomachic, and aromatic.—*Dose.* 1 or 2 table-spoonfuls, or more, 3 or 4 times a day. It is very slightly chalybeated. See also **Aromatic Iron Mixture**.

3. Sulphate of iron, 25 grs.; carbonate of potash, 30 grs.; myrrh, 60 grs.; sugar, 60 grs.; spirit of nutmegs, 4 drs.; rose water, 9½ oz. Reduce the myrrh to powder, add the carbonate of potash of sugar, and triturate them with a small quantity of rose water so as to form a thin paste, then gradually add more rose water, and the spirit of nutmegs, continuing the trituration and further addition of rose water until about eight fluid ounces of milky liquid is formed, then add the sulphate of iron previously dissolved in the remainder of the rose water and cork the bottle immediately.—*Dose.* 1 to 2 oz. as a stimulating tonic.

Mixture, Ton'ic. *Syn.* **Strengthening mixture**; **Mistura tonica**, L. *Prep.* 1. Infusion of cascarilla, 5 fl. oz.; tincture of orange peel, 7 fl. drs.; aromatic sulphuric acid, 2 fl. drs.

2. (Collier.) Decoction of bark, 5½ fl. oz.;

tincture of do., 3 fl. drs.; aromatic confection, 20 grs.; aromatic spirit of ammonia, 1 fl. dr.

3. (Thomson.) Infusion of calumba, 5½ fl. oz.; compound tincture of cinnamon and syrup of orange peel, of each, 2 fl. drs.—*Dose.* 1 to 3 table-spoonfuls, 2 or 3 times a day; in debility of the digestive organs, loss of appetite, to check nausea and vomiting, &c.

Mixture, Worm. *Syn.* MISTURA ANTHELMINTICA, M. VERMIFUGA, L. *Prep.* 1. (Collier.) Sulphate of iron, 20 grs.; infusion of quassia, 8 fl. oz.—*Dose.* Two table-spoonfuls every morning fasting.

2. (Copland.) Valerian, 2 drs.; worm-seed, 4 drs.; boiling water, 8 fl. oz.; macerate 1 hour, strain, and add of assafœtida, 1 dr., previously triturated with the yolk of one egg. As the last.

3. (Richard.) Root of male fern, 1 oz.; water, 9 fl. oz.; boil to 6 fl. oz., strain, and add, of sulphuric ether, 1 dr.; syrup of tansy, 1 fl. oz. In tape-worm; as above.

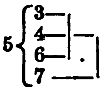
Mixture, Zinc. *Syn.* MISTURA ZINCI, M. Z. SULPHATIS, L. *Prep.* (Collier.) Sulphate of zinc, 5 grs.; sulphate of quinine, 10 grs.; compound infusion of roses, 2 fl. oz. Tonic.—*Dose.* A teaspoonful 2 or 3 times a day, in a glass of water. Said to be very efficacious in the cure of coughs of a spasmodic character.

MIXTURES (Arithmetic of). The constantly recurring necessity in business and chemical manipulations of determining the value of mixtures, and of producing articles and preparations of different strengths or prices to those already in stock, has rendered a ready means of making such calculations an indispensable qualification in almost every department of trade and industrial art. As we address ourselves to the intelligent operative and busy tradesman, as well as to those more blessed by education and leisure, we feel we are bestowing a boon on many of our readers, in giving a short, but sufficient, outline of this useful branch of commercial arithmetic, which is most intimately connected with the objects of the present work.

1. To determine the price of a mixture from the value and quantity of each ingredient of which it is composed.—RULE. Divide the 'gross value' by the 'gross saleable' or 'useful quantity;' the quotient is the value or cost per gallon, pound, &c., as the case may be.—*Example.* Required, the value per gallon of a hogshead of wine containing—

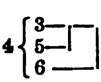
	s.	*d.*		£	*s.*	*d.*
30 gallons @	10	6	. . .	15	15	0
20 „ „	12	6	. . .	12	10	0
13 „ „	14	6	. . .	9	8	6
63			)	37	13	6
Cost per gallon. . . .				0	11	11½

2. To determine the proportions of substances or articles of different values or strengths which must be taken to prepare a mixture of any other value or strength.—RULE. Arrange the 'prices' or 'strengths of the ingredients' in a column, and link them together in pairs; each of those above the required price being always connected with another below it. Then set the difference between the required price and these numbers, alternately against those they are linked to; when they will indicate the quantities to be taken, as in the following examples:—*a.* Required the proportions of tea at 3*s.*, 4*s.*, 6*s.*, and 7*s.*, that must be taken to produce a mixture at 5*s.* the pound. Here—



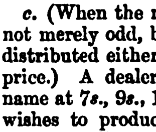
. . . . . 1, or 1 lb. @ 3*s.*
. . . . . 2, „ 2 „ „ 4*s.*
. . . . . 2, „ 2 „ „ 6*s.*
. . . . . 1, „ 1 „ „ 7*s.*

b. (When the number of the ingredients or prices is odd.) Required the proportions of teas at 3*s.*, 5*s.*, and 6*s.* the pound, to sell at 4*s.* Here the odd number must be taken a second time:—



. . . 1+2, or 3 lbs. @ 3*s.*
. . . . 1, „ 1 „ „ 5*s.*
. . . . 1, „ 1 „ „ 6*s.*

c. (When the number of the ingredients is not merely odd, but the prices are unequally distributed either above or below the required price.) A dealer having wines of the same name at 7*s.*, 9*s.*, 11*s.*, 12*s.*, and 14*s.* per gallon, wishes to produce a mixture of them worth 10*s.* per gallon:—



. . 1+4, or 5 galls. @ 7*s.*
. . . 2, „ 2 „ „ 9*s.*
. . . 3, „ 3 „ „ 11*s.*
. . . 1, „ 1 „ „ 12*s.*
. . . 3, „ 3 „ „ 14*s.*

It will be seen that by varying the manner of linking the numbers, different answers may often be obtained to the same question. It also often happens that the dealer or operator desires to use a given quantity of one particular article, or to produce a certain quantity only of the mixture instead of those indicated by the above calculations. In these instances he has simply to apply the common rule of 'practice' or the 'rule of three,' as the particular case may demand.

In the above manner the proportions of the constituents of a compound may be determined from their specific gravity, when no change of volume has arisen from their admixture; but when this is the case, as in alloys, alcoholic mixtures, &c., it is either quite inapplicable or the results obtained are mere approximations to the truth. It may, however, be conveniently employed for calculations connected with the 'mixing' and 'reduction' of spirits and other liquids, by substituting their per-centage value in 'proof gallons' or other corresponding denomination, for the prices in the above examples; water, when introduced be reckoned, =0. Thus:—A spirit merchant having two puncheons of rum of the strengths of 17 and 21 o. p., wishes to know what proportions of each and of water he must take to form a spirit 10 u. p. The proof values of 100 gallons of these spirits are respectively equal to 121, 117, 90, and 0 (water). Therefore—

90 | 0—— 27+31, or 58 g. water.
117— . 90, „ 90 „ rum @ 117 o. p.
121—— . 90, „ 90 „ rum „ 121 „

Suppose the dealer required to use different proportions of the spirits referred to, instead of equal measures, he has only to take such aliquot parts of the quantities thus found referring to the smaller proportion; or such mutiples of those referring to the larger one, as he wishes them to bear to each in the new mixture. Numerous other applications of this rule will occur to the ingenious reader.

Questions in 'alligation,' as the department of arithmetic above referred to is called, are very easily resolved by the 'method of indeterminate analysis,' even by persons but slightly conversant with rudimentary algebra; of which, indeed, they form a simple class of problems, often admitting of an almost indefinite number of solutions.

MO'HAIR. The hair of a goat indigenous in Asia Minor. It is dyed and manufactured by similar materials and in a similar manner to wool.

MOIL. See CIDER.

MOIRÉE METALLIQUE. [Fr.] A beautiful crystalline appearance produced on the surface of tin plate by acids. The tin plate is submitted for a few seconds, whilst gently heated, to the action of dilute aqua regia, by which it acquires a variegated primrose appearance. It is afterwards washed in hot water, dried, and lacquered. The degree of heat and dilution of the acid modifies the beauty and character of the surface. The effect is also varied by employing dilute sulphuric acid, either alone, or mixed with a portion of nitric or hydrochloric acid; or by using a solution of citric acid or caustic potassa. According to Herberger, the best metal for the purpose is plate iron, which has been coated by dipping it into a tin bath composed of pure tin, 200 parts; copper, 3 parts; arsenic, 1 part. The varnish should consist of copal in highly rectified spirit. Moirée metallique is in much less demand now than formerly.

MO'LASSES. See TREACLE.

MOLES. The small, soft excrescences and discolorations of the skin which are popularly known under this name may, when slight, be removed by touching them every day with a little concentrated acetic acid, by means of a hair pencil, observing due care to prevent the application from spreading to the surrounding parts. This does not discolour the skin. The application of lunar caustic is also very effective, but it turns the spot temporarily black. *In the pure mole* there is always a considerable production of hair. When other means fail, they may be easily and safely removed by surgical means. The operation is trifling; and, when judiciously performed, no trace of such a proceeding is left behind.

MOLUC'CA BALM. See LIQUEUR.

MOLYBDATE OF AMMONIUM. $(NH_4)_2MoO_4$. *Syn.* MOLYBDENIC ACID, PEROXIDE OF MOLYBDENUM; ACIDUM MOLYBDICUM, L. *Prep.* Native sulphide of molybdenum, after being well roasted, is reduced to fine powder, digested with ammonia, and the mixture filtered, and the filtrate evaporated to dryness; the residue, molybdate of ammonium, is then dissolved in water, purified by crystallisation; and, lastly, decomposed by heat.

Prop., &c. Small white scales, soluble in 570 parts of water; the solution reddens litmus paper; dissolves in the alkalies, forming alkaline molybdates, from which it is again precipitated by strong acids. It is used in the preparation of molybdenum blue, and in calico-printing, but its scarcity precludes its extensive employment in the arts. Molybdate of ammonium is the salt principally used in dyeing. Silks and cottons passed through a solution of this salt, then through a bath soured with hydrochloric acid, and, lastly (without washing), through another of protochloride of tin, are dyed of a rich and permanent blue colour. A solution of molybdate of ammonia in excess of nitric acid, forms a valuable reagent as a test for phosphates, with which it gives a beautiful yellow precipitate (phospho-molybdate of ammonia. See PHOSPHORIC ACID.

MOLYB'DENUM. Mo. A very rare metal, having a white colour, discovered by Hielm, in 1782.

Prep. By exposing molybdic acid, mixed with charcoal and placed in a covered crucible, to the strongest heat of a smith's forge.

Prop., &c. It is brittle and very infusible; when heated in contact with the air, it is converted into molybdic anhydride, MoO_3.

MOMOR'DICINE. See ELATERINE.

MONE'SIA. *Syn.* MONESIA BARK, BURANHEIM, B.; CORTEX MONESIÆ, L. The bark of *Chrysophyllum Buranheim*, a tree growing in the Brazils. The rough, imported extract of this drug also commonly passes under the name of MONESIA. It is astringent, and possesses no advantage over rhatany or catechu. —*Dose.* (Of the latter) 15 to 20 grs.

MONE'SIN. A peculiar acrid principle, analogous to saponin, found in monesia bark, to the extent of 4·7%.

MONOMA'NIA. See INSANITY.

MOR'DANT. In *dyeing* and *calico printing*, any substance employed to fix the colouring matter of dye-stuffs in the fibres of organic bodies, and to give it brilliancy and permanency. This it effects either by serving as a bond of union between the two, owing to its attraction for each of them; or it acts by uniting with the colouring particles in the minute pores of the fibres, and rendering them insoluble in the alkaline, soapy, and other liquids, to the action of which they will subsequently be exposed. When an infusion of some dye-stuff, as cochineal or madder, for example, is mixed with alum or acetate of alumina, and a little alkali, a precipitate immediately forms, consisting of alumina in combination with colouring matter, constituting a LAKE. It is by a similar reaction occurring within the fibres that the permanent dyeing of the cloth is effected. Here the colouring matter of the dyeing materials not only passes from the soluble to the insoluble form, but it enters into chemical combination with other substances, and in the new compounds it assumes greater brilliancy and permanency than it previously possessed. Annotta and safflower afford instances of the second mode of action above referred to, by which substances operate as mordants. The colouring matter of these dye-stuffs is soluble in alkaline lyes, and into a solution of this kind the cloth is dipped. It has now received an extremely fugitive colour only; but by passing it through acidulated water the alkaline solvent is abstracted, and the tinctorial matter is precipitated in an insoluble and minutely divided state within its pores, and it becomes permanently dyed. A similar reaction takes place in dyeing with the 'indigo vat,' in which atmospheric oxygen performs the part of a mordant. It is believed that even in these cases the colouring principle, during its transition from the liquid to the solid form, enters into combination with the fibres of the organic substance, and that, in proportion to the affinity existing between the two, is the integrity and excellence of the dye. In wool and silk, the affinity between their filaments and the tinctorial particles of the dye-bath is, in general, so considerable, that a permanent stain is very easily communicated to them; but with cotton and flax, the materials of which calico and linen goods are made, the reverse is the case, and the intervention of a third material, in the shape of a mordant, is absolutely necessary to dye them of a permanent colour.

"Experience has proved that, of all the bases, those which succeed best as mordants are alumina, tin, and oxide of iron; the first two of which, being naturally white, are the only ones which can be employed for preserving to the colour its original tint, at least without much variation. But whenever the mordant itself is coloured, it will cause the dye to take a compound colour quite different from its own. If, as is usually said, the mordant enters into a real chemical union with the stuff to be dyed, the application of the mordant should obviously be made in such circumstances as are known to be most favorable to the combination taking place; and this is the principle of every day's practice in the dye-house.

"In order that a combination may result between two bodies, they must not only be in contact, but they must be reduced to their ultimate molecules. The mordants to be united with stuffs are, as we have seen, insoluble in themselves, for which reason their particles must be divided by solution in an appropriate vehicle. Now, this solvent or menstruum will exert in its own favour an affinity for the mordant, which will prove to that extent an obstacle to its attraction for the stuff. Hence we must select such solvents as have a weaker affinity for the mordants than the mordants have for the stuffs. Of all acids which can be employed to dissolve alumina, for example, vinegar (acetic acid) is the one which will retain it with the least energy, for which reason the acetate of alumina is now generally substituted for alum, because the acetic acid gives up the alumina with such readiness, that mere elevation of temperature is sufficient to effect the separation of these two substances. Before the substitution of the acetate, alum alone was employed; but without knowing the true reason, all the French dyers preferred the alum of Rome, simply regarding it to be the purest; it is only within these few years that they have understood the real grounds of this preference.

"The two principal conditions, namely, extreme tenuity of particles and liberty of action, being found in a mordant, its operation is certain. But as the combination to be effected is merely the result of the play of affinity between the solvent and the stuff to be dyed, a sort of partition must take place, proportioned to the mass of the solvent, as well as to its attractive force. Hence the stuff will retain more of the mordant when its solution is more concentrated, that is, when the base diffused through it is not so much protected by a large mass of menstruum; a fact applied to very valuable uses by the practical man. On impregnating, in calico printing, for example, different spots of the same web with the same mordant in different degrees of concentration, there is obtained in the dye-bath a depth of colour upon these spots intense in proportion to the strength of their various mordants. Thus, with solution of acetate of alumina in different grades of density, and with madder, every shade can be produced from the fullest red to the lightest pink and with acetate of iron and maddder, every shade from black to pale violet." (Ure.)

In the employment of mordants in the ordinary processes of dyeing, the goods are passed through the solution for a period varying, under different circumstances, according to the object in view. The cloth is subsequently aired, dried, and well rinsed, before immersing it in the colouring bath. In *calico printing* the mordant is applied partially or topically to the cloth by means of wooden blocks, or some similar contrivance; or certain parts of the cloth are stopped out by a suitable preparation, or 'resist,' by which means a pattern is produced, as the colouring matter of the dye-bath is removed from the other portions by the washing or scouring to which it is subsequently subjected. The substances used to thicken the mordant by the calico printers, to prevent them spreading, are starch and British gum. The first is prepared for neutral solutions; the last, for acidulous ones. The removal of the undecomposed particles of the mordant, so as to preserve the other portion of the cloth from their action, is effected by the process of DUNGING (which *see*).

The process of GALLING or ROOTING, commonly employed as a preparation of cotton and linen for fast dyes, consist in working the stuff for some time, at a good hand heat, in a decoction of galls or an infusion of sumach. In this case the astringent matter plays the part of a mordant. About 2½ oz. of galls, or 5 oz. of sumach, and 3 or 4 pints of water, are commonly taken for every lb. of cotton. See CALICO PRINTING, DYEING, and the respective dye-stuffs and mordants.

Mordant. In *gilding*, any sticky matter by which gold-leaf is made to adhere. *Prep.* 1. Water or beer, rendered adhesive by the addition of a little gum, sugar, or honey, and tinged with a little gamboge or carmine, to mark the parts to which it is applied. *Used* to attach gold leaf to paper, taffety, vellum, &c.

2. (Mixtion.) From asphaltum, 1 part; mastic, 4 parts; amber, 12 parts; fused together, and then mixed with hot boiled oil, 1 pint. *Used* for gilding wood, &c. See GOLD SIZE.

MORPHIA. $C_{17}H_{19}NO_3$. *Syn.* MORPHINE (Ph. D.), MORPHINA, MORPHIUM, L. The chief active principle of opium. Morphia was discovered by Ludwig in 1688, but it was first obtained pure, and its precise nature pointed out by Sertuerner, in 1804. It is peculiar to the *Papaveraceæ*, or poppy family.

Prep. 1. (Ph. D.) Turkey opium (cut into thin slices), 1 lb., is macerated for 24 hours in water, 1 quart, and the liquid portion decanted; the residuum is macerated for 12 hours with a second quart of water, and the process is repeated with a third quart of water, after which the insoluble portion is subjected to strong pressure; the mixed liquids are evaporated by water or steam heat to a pint, and filtered through calico; to the filtrate is added a solution formed of chloride of calcium, 6 drs., dissolved in distilled water, 4 fl. oz., and the liquid is further evaporated until it is so far concentrated that nearly the whole of it becomes solid on cooling; this is enveloped in a couple of folds of strong calico, and subjected to powerful pressure, the dark liquid which exudes being preserved for subsequent use; the squeezed cake is next treated with about ½ pint of boiling water, and the undissolved portion is washed on a paper filter; the filtered solution is again evaporated, and the solid portion thus obtained submitted to pressure, as before; if the product is not quite white, this process is repeated a third time; the squeezed cake is now dissolved in boiling water, 6 fl. oz., and the solution filtered through animal charcoal (if necessary); to the clear solution is added ammonia, in slight excess; the crystalline precipitate which forms as the liquid cools, is collected on a paper filter, washed with cold distilled water, and lastly, the filter is transferred to a porous brick, in order that the morphia which it contains may become dry. (From the liquids reserved from the expressions more morphia may be obtained by dilution with water, precipitation with ammonia, resolution in boiling water, and treatment with a little animal charcoal, &c., as before.)

2. (Ph. L. 1836.) Hydrochlorate of morphia, 1 oz., is dissolved in distilled water, 1 pint; and ammonia, 5 fl. drs. (or q. s.), previously diluted with water, 1 fl. oz., is added, with agitation; the precipitate is well washed in distilled water, and dried by a gentle heat. By a similar process morphia may be obtained from its other salts.

3. (Merck.) A cold aqueous infusion of opium is precipitated with carbonate of sodium, in excess; the precipitate washed, first with cold water, and then with cold alcohol of sp. gr. 85; the residuum is dissolved in weak acetic acid, the solution filtered through animal charcoal, and precipitated with ammonia; the precipitate is again washed with cold water, dissolved in alcohol, and crystallized. A good process where spirit is cheap.

4. (Mohr.) Opium, 4 parts, is made into a strong infusion with water, q. s.; lime, 1 part, reduced to the state of milk with water, is then added; the mixture is next heated to boiling, at once filtered through linen, and treated, whilst still hot, with chloride of ammonium, in fine powder, in slight excess (about 1 oz. to each lb. of opium); the morphia is deposited as the liquid cools, and may be purified by a second solution in lime and precipitation by chloride of ammonium. This process is remarkably simple, and in many points is preferable to any other, either on the small or large scale.

5. (PURE.) A filtered solution of opium in tepid water is mixed with acetate of lead in excess; the precipitate (meconate of lead) is separated by a filter, and a stream of sulphuretted hydrogen is passed through the nearly colourless filtrate; the latter is warmed, to expel excess of the gas, once more filtered, and then mixed with a slight excess of ammonia, which throws down narcotine and morphia; these are separated by boiling ether, in which the former is soluble.

Prop. The morphia of commerce is a white crystalline powder; but when crystallized from alcohol, it forms brilliant prismatic crystals of adamantine lustre, and the formula $C_{17}H_{19}NO_3 . H_2O$. It exerts an alkaline reaction on test paper; imparts a perceptible bitter taste to water; requires 1160 parts of cold water, and 94 parts of boiling water, for its solution; insoluble in ether; dissolves in 90 parts of cold and about 30 parts of boiling alcohol; it also dissolves in the fixed and volatile oils, and in solutions of the alkalies; heated in close vessels, it forms a yellow liquid, like melted sulphur, which becomes white and crystalline on cooling; heated in the air, it melts, inflames like a resin, and leaves a small quantity of charcoal behind. With the acids it forms salts, which are mostly soluble and crystallisable. These may all be made by the direct solution of the alkaloid in the dilute acid. The only ones of importance are the acetate, hydrochlorate, and sulphate.

Pur. Commercial morphia and its preparations are often contaminated with codeine, narcotine, and colouring matter. The proportion of the first two may be estimated by the loss of weight which the sample suffers when digested in ether; or by dissolving out the morphine by digestion in weak liquor of potassa. Pure morphia "is scarcely soluble in cold water, sparingly so in boiling water, and readily so in alcohol. This solution is alkaline to test paper, and by evaporation leaves crystals, which are wholly dissipated by heat. It is soluble in pure potassa." (Ph. L. 1836.)

Tests. 1. Potassium hydrate and ammonia precipitate morphia from solution of its salts, under the form of a white crystalline powder, which is very soluble in excess of hydrate of potassium, and, with somewhat more difficulty, in excess of ammonia. The solution formed by excess of the first is precipitated on the addition of bicarbonate of potassium. The precipitate in either case is] soluble in a solution of chloride of ammonium, and in dilute acetic acid, and is insoluble in ether. A careful inspection of the precipitate through a lens of small power shows it to consist of minute acicular crystals; and seen through a glass which magnifies 100 times, these crystals present the form of right rhombic prisms.—2. The carbonates of potassium and sodium produce the same precipitate as hydrate of potassium, and which is insoluble in excess of the precipitant.—3. The bicarbonates of potassium and sodium also give similar precipitates from neutral solutions, insoluble in excess. In each of the above cases stirring with a glass rod and friction on the sides of the vessel promote the separation of the precipitate.—4. If to a mixture of morphia and oil of vitriol a minute fragment of bichromate of potassium be added, oxide of chromium is set free, and a fine green colour developed.—5. A drop or two of solution of terchloride of gold added to a weak solution of morphia gives a yellow precipitate, which is mostly redissolved on agitating the liquid, which then assumes various hues (green, blue, violet, purple) on the addition of a drop of liquor of potassa.—6. A minute fragment of terchloride of gold and of hydrate of potassium very gently dropped into the liquid, occasion purple clouds or streaks in dilute solutions, followed by a precipitate, which is violet, purple, or blue-black, according to the strength of the liquid.

The above are the most reliable precipitates for morphia; the first two may, indeed, be regarded as characteristic, and the remainder as almost so. The following are often referred to by medical writers, but are less exclusive and trustworthy:—Morphia and its salts are —7. Reddened by nitric acid, and form orange-red solutions, darkened by ammonia in excess, and ultimately turning yellow, with the production of oxalic acid.—8. They are turned blue by ferric chloride, either at once or on the addition of an alkali, and this colour is destroyed by water and by alkalies, or acids in excess.—9. Iodic acid added to their solutions turns them yellowish-brown, by setting iodine free, and the liquid forms a blue compound with starch.

Uses. Morphia and its salts are exhibited either in substance, made into pills, or in solution, generally the latter; or externally, in fine powder, applied to the dermis denuded of the cuticle. They are principally employed as anodynes and hypnotics in cases in which opium is inadmissible, and are justly regarded as the most valuable medicines of their class. "In cases wherein both opium and the morphine salts are equally admissible, I prefer the former, its effects being better known and regulated; moreover, opium is to be preferred as a stimulant and sudorific, and for suppressing excessive mucous discharges." (Pereira.)—*Dose.* Of pure morphia, $\frac{1}{12}$ to $\frac{1}{6}$ gr.; of its salts, $\frac{1}{8}$ to $\frac{1}{4}$ gr.; externally, $\frac{1}{2}$ to $1\frac{1}{2}$ gr. Morphine is chiefly used for the preparation ot the acetate, and some of its other salts.

Good opium yields from 10% to 13% of morphia. See OPIUM.

Morphia, Ac'etate of. $C_{17}H_{20}NO_3C_2H_3O_2$. *Syn.* MORPHIÆ ACETAS (Ph. L. E. & D.), L. *Prep.* 1. (Ph. L. 1836.) Morphia, 6 drs.; acetic acid (Ph. L.), 3 fl. drs.; distilled water, 4 fl. oz.; dissolve, gently evaporate, and crystallise.

2. (Ph. E.) Hydrochlorate of morphia, 1 part, is dissolved in warm water, 14 parts; and the solution, when cold, is precipitated with ammonia, in slight excess, the precipitate is washed in cold water, and dissolved, by means of acetic acid, in excess, in warm water, 12 parts; from the solution crystals are obtained as before.

3. (Ph. D.) Morphia (in fine powder), 1 oz.; rectified spirit, 8 fl. oz.; mix, apply a gentle heat, and add of acetic acid (sp. gr. 1·044), $4\frac{1}{2}$ fl. drs. or q. s., until a neutral or slightly acid solution is obtained; evaporate this to the consistence of a syrup by steam or water heat, and set aside the residuum for a few days until it solidifies.

Pur. "Soluble in water and in rectified spirit" (less so in the former than the latter); "and when the spirit is distilled from the solution, it yields crystals which are totally destroyed by heat." (Ph. L.) "100 measures of a solution of 10 grs. in ½ fl. oz. of water, and 5 minims of acetic acid, heated to 212° and decomposed by a very slight excess of ammonia, yield by agitation a precipitate which, in 24 hours, occupies 15½ measures of the liquid." (Ph. E.)

Obs. The acetate of morphia of commerce is usually in the form of a whitish powder, and is prepared by the mere evaporation of the solution to dryness by a gentle heat. During the process a portion of the acetic acid is dissipated, and hence this preparation is seldom perfectly soluble in water, unless it has been slightly acidulated with acetic acid. In the Ph. L. 1851 this salt (in crystals) is included in the materia medica. See MORPHIA (*above*).

Morphia, Hydri'odate of. $C_{17}H_{19}NO_3,HI$. *Syn.* MORPHIÆ HYDRYIODAS, L. *Prep.* (A. T. Thomson). Hydrochlorate of morphia, 2 parts; iodide of potassium, 1 part; dissolve each separately in a little water, mix the solutions, wash the precipitate in a little very cold water, press it in bibulous paper, redissolve it in hot water, and crystallise.

Morphia, Hydrochlo''rate of. $C_{17}H_{19}NO_3,HI$. *Syn.* MURIATE OF MORPHIA; MORPHIÆ HYDROCHLORAS (Ph. L.), MORPHIÆ MURIAS (Ph. E. D.&U. S.), L. *Prep.* 1. (Ph. L. 1836.) Macerate sliced opium, 1 lb., in water, 4 pints, for 30 hours; then bruise it, digest it for 20 hours more, and press it; macerate what remains a second and a third time in water until exhausted, and as often bruise and press it; mix the liquors, and evaporate at 140° Fahr. to the consistence of a syrup; add of water, 3 pints, and after defecation decant the clear portion; gradually add to this liquid crystallised chloride of lead, 2 oz. (or q. s.), dissolved in boiling water, 4 pints, until it ceases to produce a precipitate; decant the clear liquid, wash the residuum with water, and evaporate the mixed liquids, as before that crystals may form; press these in a cloth, then dissolve them in distilled water, 1 pint, add freshly burnt animal charcoal, 1½ oz., digest at 120°, and filter; finally, the charcoal being washed, cautiously evaporate the mixed liquors, that pure crystals of hydrochlorate of morphia may form. To the decanted liquor from which the crystals were first separated, add of water, 1 pint, and drop in liquor of ammonia, frequently shaking, until all the morphine is precipitated; wash this precipitate with cold distilled water, saturate it with hydrochloric acid, digest with animal charcoal, 2 oz.; filter, wash the filter as before, and evaporate the mixed liquors, cautiously, as above, that pure crystals may be obtained.

2. (Ph. E.) Opium, 20 oz., is exhausted with water, 1 gal., in the quantity of a quart at a time, and the mixed liquors are evaporated to a pint; chloride of calcium, 1 oz., dissolved in water, 4 fl. oz., is added, and, after agitation, the liquid is placed aside to settle; the clear decanted liquid, and the washings of the sediment, are next evaporated, so that they may solidify on cooling; the cooled mass, after very strong pressure in a cloth, is redissolved in warm water, a little powdered white marble added, and the whole filtered; the filtrate is acidulated with hydrochloric acid, the solution again concentrated for crystallisation, and the crystals submitted to powerful pressure, as before; the process of solution, clarification, with powdered marble and hydrochloric acid, and crystallisation, is repeated until a snow-white mass is obtained. This is the process of Gregory and Robertson, and is one of the easiest and most productive on the large scale. To procure the salt quite white, 2 to 4 crystallisations are required, according to the power of the press employed. The Edinburgh College recommends, on the small scale, the solution, after two crystallisations, to be decoloured by means of animal charcoal; but, on the large scale, to purify the salt by repeated crystallisations alone.

3. (Mohr.) By dissolving the precipitate of morphia (see MORPHIA, *prep.* 4) in dilute hydrochloric acid, and by crystallisation, as before.

Pur., &c. It "is completely soluble in rectified spirit, and in water. What is precipitated from the aqueous solution by nitrate of silver is not entirely dissolved, either by ammonia, unless added in excess, or by hydrochloric or nitric acid." (Ph. L.) "Snowy white; entirely soluble; solution colourless; loss of weight at 212° Fahr. not above 13%; 100 measures of a solution of 10 grs., in water, ½ fl. oz., heated to 212°, and decomposed with agitation by a faint excess of ammonia, yield a precipitate which, in 24 hours, occupies 12½ measures of the liquid." (Ph. E.) It takes 20 parts of cold and about its own weight of boiling water to dissolve it. The hydrochlorate of morphia of the shops is usually, like the acetate, under the form of a white crystalline powder.

Obs. Of all the salts of morphia, this one appears to be that most suitable for medical purposes, from its free solubility, and from its solution not being liable to spontaneous decomposition, at least under ordinary circumstances. "The opium which yields the largest quantity of precipitate by carbonate of sodium yields muriate of morphia, not only in the greatest proportion, but also with the fewest crystallisations." (Ph. E.) Smyrna opium contains the most morphine.

Morphia and Codei'a (Hydrochlorate of). *Syn.* GREGORY'S SALT; MORPHIÆ ET CODEIÆ HYDROCHLORAS, L.; SEL DE GREGORY, Fr. This is commercial HYDROCHLORATE OF MORPHINE prepared according to Dr. Gregory's process.

Mec'onates of Morphia. $(C_{19}H_{20}NO_3)_2,C_7H_2O_7$. *Prep.* 1. (NEUTRAL MECONATE OF MORPHINE; MORPHIÆ MECONAS, L.) By saturating an aqueous solution of meconic acid with morphia, and evaporating the solution by a gentle heat, so that crystals may be obtained.

2. (Bimeconate of morphine; Morphiæ ieconas, L.) $C_{17}H_{19}NO_3HC_7H_3O_7$. Meconic d, 11 parts; morphia, 14 parts; dissolve h separately, in hot water, q. s.; mix the utions, and either gently evaporate and crys- lize, or at once evaporate to dryness.

Obs. Morphia exists in opium under the m of bimeconate, and hence this preparation that drug has been preferred by some prac- oners. A solution of this salt for medical rposes may be directly prepared from um, by treating its solution in cold water h a little animal charcoal, filtering, gently porating to dryness, redissolving the resi- um in cold water, filtering, and repeating treatment with animal charcoal. The e of the dry bimeconate is ¼ gr., or more; l of the meconate rather less. "A powder also sold, called 'bimeconate of morphia,' ich is of the same strength as powdered um, and is given in similar doses. It is iously incorrect to apply this name to a vder which consists principally of foreign tter. It is to be hoped that physicians will prescribe this powder under the above ne, as such a practice might lead to fatal ults, if the prescription should be prepared h the substance which the name strictly icates." (Redwood.)

ul'phate of Morphia. *Syn.* Morphiæ phas, L. *Prep.* Saturate very dilute sul- iric acid with morphia, evaporate to one f, add a little animal charcoal, continue the poration for a short time longer at a gentle t, filter whilst hot, and abandon it to spon- eous evaporation. It is decomposed by ving off the water of crystallization. Sul- te of morphia is included in the Ph. U. S. ording to Magendie, this salt sometimes ees with patients who cannot bear the tate.

IORPHIOM'ETRY. A name given to the cess of determining the richness of opium morphia. See Opium.

IORISON'S PILLS. See Patent Me- ines.

IORSU'LI. An old name applied to nges and masticatories. It is still retained ome foreign Pharmacopœias.

IOR'TAR is the well-known cement, made lime, sand, and water, employed to bind ks and stones together in the construction valls, buildings, &c.

n the composition of mortar, stone lime is ferred to that obtained from chalk, and r sand to pit or road sand. Sea sand is tted for mortar until it it has been well ed and washed in fresh water. Sifted coal s are frequently substituted for the whole part of the sand.

Iydraulic mortars or cements are those ch, like Roman cement, are employed for ks which are either constantly submerged are frequently exposed to the action of er. The poorer sorts of limestone are chosen for this purpose, or those which contain from 8% to 25% of alumina, magnesia, and silica. Such limestones, though calcined, do not slake when moistened; but if pulverized, they absorb water without swelling up or heating, like fat lime, and affords a paste which hardens in a few days under water, but in the air they never acquire much solidity.

"The essential constituents of every good hydraulic mortar are caustic lime and silica; and the hardening of this composition under water consists mainly in a chemical combination of these two ingredients through the agency of the water, producing a hydrated silicate of lime. But such mortars may contain other ingredients besides lime, as, for example, clay and magnesia, when double silicates of great solidity are formed; on which account dolomite is a good ingredient in these mortars. But the silica must be in a peculiar state for these purposes, namely, capable of affording a gelatinous paste with acids; and if not so already, it must be brought into this condition, by calcining it along with an alkali or an alkaline earth, at a bright red heat, when it will dissolve and gelatinize in acids. Quartzose sand, however fine its powder may be, will form no water mortar with lime; but if the powder be ignited with the lime, it then becomes fit for hydraulic cement. Ground felspar or clay forms with slaked lime no water cement; but when they are previously calcined along with the lime, the mixture becomes capable of hardening under water."

"All sorts of lime are made hydraulic, in the humid way, by mixing the slaked lime with solutions of common alum or sulphate of alumina; but the best method consists in employing a solution of the silicate of potash, called liquor of flints or soluble glass, to mix in with the slaked lime or lime and clay. An hydraulic cement may also be made which will serve for the manufacture of architectural ornaments, by making a paste of pulverized chalk, with a solution of the silicate of potash. The said liquor of flints likewise gives chalk and plaster a stony hardness, by merely soaking them in it after they are cut or moulded to a proper shape. On exposure to the air, they get progressively indurated. Superficial hardness may be readily procured by washing over the surface of chalk, &c., with liquor of flints, by means of a brush. This method affords an easy and elegant method of giving a stony crust to the plastered walls and ceilings of apartments; as also to statues and busts, cast in gypsum mixed with chalk."

Under Prof. Kuhlman's patent, dated April, 1841, "instead of calcining the limestone with clay and sand alone, as has been hitherto commonly practised, this inventor introduces a small quantity of soda, or, preferably, potash, in the state of sulphate, carbonate, or muriate; salts susceptible of forming silicates when the earthy mixture is calcined. The alkaline salt, equal in weight to about 1-6th that of the lime, is introduced in solution among the earths." (Ure).

The hardening of the common mortars and cements is in a great measure due to the gradual absorption of carbonic acid; but even after a very great length of time, this conversion into carbonate is not complete. Good mortar, under favorable circumstances, acquires extreme hardness by age.

Attempts have been made at various times to introduce the use of bituminous cements into this country, and thus to restore both to land and submarine architecture a valuable material which has now lain neglected for a period of fully 30 centuries; but, unfortunately, owing to the interest of our great building and engineering firms lying in another direction, these attempts have been hitherto unsuccessful. See Asphaltum, Cement, Lime, &c.

MORTIFICA'TION. *Syn.* Gangrene; Gangrena, Mortificatio, L. Local death; the loss of vitality in one part of the animal body, whilst the rest continues living. "The terms gangrene and mortification are often used synonymously; but gangrene properly signifies the state which immediately precedes mortification, while the complete mortification, or absolute death of a part, is called sphacelus. A part which has passed into the state of sphacelus is called a slough.

MOSA'IC GOLD. See Brass, Gold, &c.

MOS'SES. *Syn.* Musci, L. Several vegetables of the natural orders *Algæ*, *Fungi*, *Lichenes*, and *Musci*, commonly pass under this name with the vulgar. Of these the following are the principal.—

Bog moss (*Sphagnum palustre*). Very retentive of moisture. *Used* to pack up plants for exportation.

Ceylon moss (*Gracilaria candida*). Very nutritive; made into a decoction or jelly, which is highly esteemed as an article of diet for invalids and children, more especially for those suffering under affections of the mucous membranes or phthisis.

Club moss (*Lycopodium clavatum*). See Lycopodium.

Corsican moss, C. worm m. (*Gracilaria Helminthocorton*). *Dose.* ½ to 2 drs., in powder, mixed up with sugar; as a vermifuge.

Cup moss, C. lichen (*Cladonia pyxidata*). Astringent and febrifuge. A cupful of the decoction, taken warm, generally proves gently emetic. *Used* in hooping-cough, &c.

Fir club moss (*Lycopodium Selago.*) Violently emetic and purgative. It is also irritant and narcotic.

Iceland moss (*Cetraria Islandica*). Highly nutritious and easy of digestion. The decoction is a favourite alimentary substance in affections of the lungs and digestive organs. In Iceland, after the bitter has been removed by soaking it in hot water, it is made into jelly, or dried, ground to flour, and made into bread.

Irish moss, Pearl m., Carrageen m. (*Chondrus crispus*). Very nutritious. The decoction or jelly is a useful and popular demulcent and emollient in pulmonary affections, dysentery, scrofula, rickets, &c. It is often employed by cooks and confectioners instead of isinglass, and by painters to make their size.

Rein-deer moss (*Cladonia rangiferina*). Esculent, very nutritious.

MOTHER OF PEARL. See Pearl.

MOTH'ER WATER. See Crystallization.

MOULDS. Numerous materials and compositions are employed for the purpose of taking moulds, among which are the following:—

1. (Compo'.)—*a.* From spermaceti, stearine or hard tallow, and white wax, equal parts, melted together. For fine work, as medals, small casts, &c.

b. From black resin, ¾ lb.; hard tallow, ¼ lb.; bees' wax, 6 oz.; as the last. For coarse work, as architectural ornaments, &c. The above are poured on the objects to be copied (previously oiled) whilst in the melted state. Articles in plaster of Paris are first soaked in water, observing that none of it remains on the surface so as to interfere with the design.

2. (Elastic.)—*a.* Flexible or elastic moulds may be made of gutta percha softened in boiling water, and after being freed from moisture, pressed strongly against the object to be copied, by means of a screw press. A ring or support should be employed to prevent undue lateral spreading.

b. By the use of gelatin or glue, elastic moulds are formed capable of reproducing, with accuracy, and in a single piece the most elaborately sculptured objects, of exquisite finish and delicacy. Casts from these are now common in the streets. The credit of the application of this substance to this purpose is due to M. H. Vincent. The process of casting consists in simply dissolving a certain quantity of gelatin in hot water until it is reduced to the state of liquid paste, when it is run over the object, previously oiled, intended to be reproduced. As it cools, the gelatin assumes a consistency offering a considerable degree of resistance, and is highly elastic, which latter quality enables it to be easily detached from the work on which it has been fitted. In the hollow formed by the gelatin, the finest plaster, mixed to a thick cream with water, is next run; and when the plaster has acquired the requisite hardness, the gelatin mould is detached in the same manner as from the original. From this apparently fragile mould as many as six copies may be taken, all reproducing the original with unerring fidelity.

3. (Metallic.)—*a.* From fusible metal.[1]

b. (Clichée moulds.) From a fusible alloy formed of bismuth, 8 parts; lead, 5 parts; tin, 4 parts; antimony, 1 part; repeatedly melted together. The above are poured out in the melted state on a plate or slab, and after being stirred until in a pasty state, the object to be copied is strongly pressed on the alloy at the moment it begins to solidify. They are chiefly *used* for medals and other like objects.

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[1] See Fusible Alloys.

c. (Chameroy's Patent.) By melting together one part of some easily fusible metal in a crucible, and then mixing with it four parts of a metal far less readily fusible, steeped in ammonia and reduced to powder. Such a compound is stated to be of great solidity, hardness, facility of soldering, melts at a low temperature, and has great tractability in moulding to any form; and in casting takes the sharpest impressions, whilst in its nature it is peculiarly unchangeable. See ELECTROTYPE.

MOUTH COSMET'ICS. See BREATH, TEETH, LOZENGE, PASTE, POWDER, WASHES, &c.

MOX'AS. Substances burnt upon the body, for the purpose of acting as counter-irritants, and allaying deep-seated pains and inflammation. They have been used in gout, rheumatism, &c. The small cone constituting the moxa is placed upon a part, lighted, and allowed to burn to its base. The CHINESE and JAPANESE moxas are made of the downy portion of the leaves of a species of wormwood (*Artemisia sinensis*); but various other substances, as the pith of the sunflower, cotton, or paper, soaked in a weak solution of nitrate, chlorate, or chromate of potassium, answer as well. The actual cautery is said to be preferable to any of them.

MU'CILAGE. *Syn.* MUCILAGO, L. An aqueous solution of gum, or other like substance, that gives a considerable consistency to water. See DECOCTION, MIXTURE, &c.

Trag'acanth, Mucilage. *Syn.* MUCILAGO TRAGACANTHÆ (B. P., Ph. E., and Ph. D. 1826), L. *Prep.* 1. (Ph. E.) Tragacanth, 2 drs; boiling water, 9 fl. oz. (8 fl. oz.—Ph. D.); macerate for 24 hours, triturate, and press through linen.

2. (B. P.) Tragacanth, in powder, 60 grs.; distilled water, 10 oz. To the water contained in a pint bottle add the tragacanth, agitate briskly for a few minutes, and again at short intervals, until the tragacanth is perfectly diffused, and has finally formed a mucilage.—*Dose.* 1 oz. (Should be made as required. One part of tragacanth gives more viscosity to water than twenty-five parts of gum arabic.—Squire.) *Used* in medicine as a demulcent, and as an application to burns, &c., and in pharmacy in making up pills, and to suspend heavy powders in liquids.

MUDAR'IN. *Syn.* MADARINE. A peculiar substance, possessing powerful emetic properties, extracted from the root bark of *Calotropis gigantea*, in which it exists to the extent of 11%. (Duncan.) It is soluble in water and in alcohol, and its aqueous solution, unlike that of most other substances, gelatinises by heat, and becomes fluid again on cooling.

MUF'FINS. *Prep.* Take of fine flour, ¼ peck; warm milk-and-water, 1 quart; yeast, a wine-glassful; salt, 2 oz.; mix for 15 minutes, then further add of flour, ½ peck, make a dough, let it rise 1 hour, roll it up, pull it into pieces, make them into balls, put them in a warm place, and when the whole dough is made into balls, shape them into muffins, and bake them on tins; turn them when half done, dip them into warm milk, and bake them to a pale brown.

MUF'FLE. See ASSAYING.

MUL'BERRY. *Syn.* MORUM, L. Mulberries (MORA, MORI BACCÆ) are the fruit of *Morus nigra*, or black mulberry tree. They are cooling and laxative; but when eaten too freely, are apt to disorder the stomach and bowels. Mulberry juice (*mori succus*) is officinal in the Ph. L. A syrup (SYRUPUS MORI) is made of it. It is also, occasionally, made into wine.

MUL'TUM. A mixture of extract of quassia and liquorice, used by fraudulent brewers instead of malt and hops.

MUM. A beverage prepared from wheat malt, in a similar way to ordinary beer from barley malt. A little oat and bean meal is frequently added. It was formerly much drunk in England; but its use at the present day is chiefly confined to Germany, and to Brunswick more particularly.

MUMPS. *Syn.* PAROTITIS, L. Inflammation of the parotid gland, which is situated under the ear. There is little constitutional derangement, but the cheeks become swollen and painful, and there is some difficulty in opening the mouth, and in swallowing. The treatment consists in simply keeping the part warm with flannel, and the use of warm fomentations, at the same time that the bowels are kept freely open with some mild laxative.

The mumps are said to be contagious, as, when the affection appears in a school, it generally goes through every member of it. Low, damp situations are those most favorable to this affection.

Prop., &c. It is only very slightly soluble in cold water; freely soluble in solutions of ammonia and the fixed alkalilies; the first, by exposure to the air, becomes purple, and deposits brilliant crystals of murexide. These compounds are the purpurates of Dr. Prout.

MUREX'IDE. $C_8N_6H_8O_6$. *Syn.* PURPURATE OF AMMONIUM.

Prep. (Gregory.) Alloxan, 7 parts; alloxantin, 4 parts; boiling water, 240 parts; dissolve, and add the solution to a cold and strong solution of carbonate of ammonia, 80 parts; crystals of murexide will separate as the liquid cools.

Obs. Murexide can be obtained directly from uric acid by the action of nitric acid and subsequent treatment with ammonia. This process is, however, very precarious, and often fails altogether.

Prop., &c. It forms iridescent crystals, having a metallic lustre, of a magnificent green colour by reflected light, and an equally beautiful reddish-purple by transmitted light. It is soluble in boiling water, only very slightly soluble in cold water, and insoluble in alcohol and ether. A few years ago murexide was extensively used in dyeing; it is now almost superseded by rosaniline or magenta. An analogous substance, formed as above, by treating amalic acid with ammonia, is called 'caffein-murexide.'

MU'RIATE. An old name for hydrochlorate and chloride.

MURIATIC ACID. *Syn.* Hydrochloric Acid, which see.

MURIDE. The name originally given to bromine, by M. Balard.

MUR'RAIN. *Syn.* Black-leg, Black-quarter. A disease affecting neat cattle, more especially young animals, in the spring and autumn. The common symptoms are tumefaction and discoloration of one of the hind quarters of the animal, with consequent lameness and inability to move; a peculiar emphysema and intumescence of various parts of the body, particularly over the region of the spine, accompanied with all the common indications of putrid fever. In severe cases, gangrene soon follows, and death frequently ensues in from 12 to 24 hours.

The rapid progress of this disease admits of little being done in the way of cure. Extensive scarifications of the affected part, charcoal or hot yeast poultices, or fomentations, and active purgatives, appear to constitute the most useful treatment. The following drenches have been recommended for this affection:—

1. (Blaine.) Sweet spirit of nitre, ½ fl. oz.; powdered cascarilla, 2 oz.; solution of acetate of ammonia, 4 fl. oz.; yeast, 8 fl. oz.; given every 3 or 4 hours.

2. (Clater.) Laudanum and sweet spirit of nitre, of each, ½ fl. oz.; solution of chloride of lime, ½ fl. oz.; prepared chalk, 1 oz.; warm gruel, 1 pint.

The apparent incurability of this disease renders it of the utmost importance to the farmer to adopt preventive measures. These should consist of the supply of wholesome food and pure water, the adoption of extreme cleanliness, and the free access of pure air to all the stalls, sheds, and other buildings in which the cattle may be sheltered. As the disease is regarded as contagious by many persons, it is prudent to separate, as speedily as possible, the healthy animals from those affected. The free use of chloride of lime, as a disinfectant, is also advisable.

Other and more immediate preventives consist of the occasional exhibition of a saline aperient, and the introduction of a seton into the dewlap.

MUSH'ROOMS. Edible fungi. The species commonly eaten in England are the *Agaricus campestris*, or common field or garden mushroom, used to make ketchup, and eaten either raw, stewed, or broiled;—the *Morchella esculenta*, or morel, used to flavour soups and gravies;—and the *Tuber cibarium*, or common truffle, also used as a seasoning.

Several fungi, which to the inexperienced closely resemble the common edible mushroom, possess poisonous narcotic properties, and their use has not unfrequently been productive of serious, and, in some cases, fatal results. Unfortunately, no simple tests exist by which the edible and poisonous varieties can be distinguished from each other. So strongly was the late Professor L. C. Richards, the eminent botanist, impressed with this feeling, that though no one was better acquainted with the distinctions of fungi than he was, yet he would never eat any except such as had been raised in gardens, in mushroom beds. Certainly all mushrooms may be regarded as suspicious which are either not so raised, or not collected from a known pasture or meadow by a competent judge.

The following general characters given by Professor Bentley enable us, in most cases, to distinguish the edible species:—

Edible Mushrooms.

1. Grow in dry, airy places.
2. Generally white or brownish.
3. Have a compact, brittle flesh.
4. Do not change colour when cut by the action of the air.
5. Juice watery.
6. Odour agreeable.
7. Taste not bitter, acrid, or astringent.

Poisonous Mushrooms.

1. Grow in clusters, in woods, and dark, damp places.
2. Usually with bright colours.
3. Flesh tough, soft, and watery.
4. Acquire a brown, green, or blue tint, when cut and exposed to the air.
5. Juice often milky.
6. Odour commonly powerful and disagreeable.
7. Have an acrid, astringent, acid, salt, or bitter taste.

In cases of poisoning by fungi, vomiting should be immediately induced by an emetic and tickling the fauces with the finger or a feather; after which a purgative clyster or a strong cathartic should be administered, with ½ to 1 fl. dr. of ether in a glassful of water or weak brandy. As an antidote, a solution of tannin, ½ dr., in water, 1½ pint, or a decoction of ½ oz. of powdered galls, or of 1 oz. of powdered cinchona bark, in a like quantity of water, has been strongly recommended by M. Chansarel.

Alexis Soyer recommended the excellent method of cooking mushrooms by baking them under a glass or basin on toast, along with scalded or clotted cream, or a little melted butter, with one clove, and salt, pepper, &c., to taste. They take about ½ of an hour in a gentle oven or before the fire. When they are taken up, do not remove the glass for a few minutes, by which time the vapour will have become condensed and gone into the bread; but when it is, the aroma, which is the essence of the mushroom, is so powerful as to pervade the whole apartment.

MUSK. *Syn.* MOSCHUS. (B. P., Ph. L. E. & D.), L. "A secretion deposited in a follicle of the prepuce of *Moschus moschiferus*, Linn." Ph. L.), an animal inhabiting the mountains of Eastern Asia. It is imported from Bengal, China, and Russia; and, latterly, from the United States of America. That known as TONQUIN MUSK is the most esteemed for its odour; but that from Russia is the only kind which reaches us in perfect bags, or which has not been tampered with. POD MUSK (MOSCHUS IN VESICIS) is the bag in its natural state, containing the musk. The average weight of one of the pods is about 6 drs.; that of the grain musk which it contains, about 2½ drs.

Pur., &c. The musk of the shops is generally adulterated. Dried bullock's blood or chocolate is commonly employed for this purpose, along with a little bone-black. The extent of these additions varies from 25% to 75% of the gross weight of the mixture. The blood is dried by the heat of steam or a water bath, then reduced to coarse powder, and triturated with the genuine musk in a mortar along with a few drops of liquor of ammonia. It is then either replaced in the empty pods, or it is put into bottles, and sold as grain musk. There are only three certain ways of detecting this fraud, viz.—by the inferiority of the odour, by an assay for the iron contained in the blood, or—by the microscope. Genuine musk often becomes nearly inodorous by keeping, but recovers its smell on being exposed to the vapour of ammonia, or by being moistened with ammonia water. The perfumers sometimes expose it to the fetid ammoniacal effluvia of privies for the same purpose.

Pure musk, by trituration or digestion with boiling water, loses about 75% of its weight, and the boiling solution, after precipitation with nitric acid, is nearly colourless. A solution of acetate of lead, and a cold decoction of galls, also precipitate the solution; but one of corrosive sublimate does not disturb it. The ashes left after the incineration of pure musk are neither red nor yellow, but gray, and should not exceed 5 to 6%. The Chinese appear to be the most skilful and successful adulterators of musk. One of the best solvents for musk is ether.

Uses, &c. Musk is chiefly employed for its odour. As a *medicine*, it is a powerful stimulant and antispasmodic, and is a valuable remedy in various diseases of a spasmodic or hysterical character, or attended with low fever. *Dose.* 5 to 10 grs., made into an emulsion.

Musk, Factitious. *Syn.* RESIN OF AMBER; RESINA SUCCINI, MOSCHUS ARTIFICIALIS, M. FACTITIUS, L. *Prep.* 1. Oil of amber, 1 fl. dr.; nitric acid, 3½ fl. drs.; digest in a cold tumbler, and, after 24 hours, wash in cold water the orange-yellow resinous matter which has formed, and carefully dry it.

2. (Elsner.) From oil of amber, 1 part; fuming nitric acid, 3 parts; as the last, but employing artificial cold to prevent any portion of the oil being carbonised.

Obs. Resin of amber smells strongly of musk, and is said to be antispasmodic and nervine. A tincture (TINCTURA RESINÆ SUCCINI) is made by dissolving 1 dr. of it in rectified spirit, 10 fl. drs., of which the *dose* is 1 fl. dr.; in hooping-cough, low fevers, &c.

Dr. Collier mentions an artificial musk, prepared by digesting for 10 days nitric acid, ½ oz., on fetid animal oil, obtained by distillation, 1 oz.; then, adding of rectified spirit, 1 pint, and digesting the whole for a month.

MUSK SEED. *Syn.* GRAINS D'AMBRETTE. The seed of *Abelmoschus moschatus*, or musk mallow. They are chiefly *used* for their odour, in perfumery, hair powder, coffee, &c.

MUS'SEL, See SHELL-FISH.

MUST. *Syn.* MUSTUM, L. The expressed juice of ripe grapes, before fermentation. When boiled to 2-3rds, it is called CARENUM; when boiled to ½, it is called SAPA. On further concentration, it yields a species of granular sugar (grape sugar).

Must, Facti″tious. *Syn.* MUSTUM FACTITIUM, L. *Prep.* Dissolve cream of tartar, ¾ oz., in boiling water, 7 pints; when cold, add of lump sugar, 2½ lbs.; raisins (chopped small, ½ lb.; digest for 3 or 4 hours, strain through flannel as quickly as possible, and add of lemon juice, ½ pint.

MUS'TARD. *Syn.* SINAPIS, L. "The seed of *Sinapis nigra* and *S. alba*." (Ph. L.) "Flour of the seeds of *Sinapis nigra*, generally mixed with those of *Sinapis alba*, and deprived of fixed oil by expression." (Ph. E.) "The flour of the seeds." (Ph. D.) "The seeds of the *Sinapis nigra* and *S. alba* reduced to powder and mixed." (B. P.) That of the shops is very frequently adulterated with wheat flour. When this is the case it does not readily make a smooth paste with water, but exhibits considerable toughness, and somewhat of a stringy appearance, especially when little water and much heat is employed. The common proportions taken by some grocers are—dried common salt, wheat flour, and superfine mustard, equal parts; with turmeric, to colour, and cayenne, q. s. to give it piquancy and fire.

Uses, &c. Pure flour of mustard is used in medicine, to make stimulating poultices, pediluvia, &c. As a condiment, it is useful in torpor and coldness of the digestive organs. A few years since the use of mustard seed, by spoonfuls, *ad libitum*, was a common and fashionable remedy in torpor or atony of the digestive organs. The practice was a revival of that recommended by Dr. Cullen; but it has now again sunk into disuse. Sir John Sinclair also approved of the use of mustard seed in this way, especially for the preservation of the health of the aged. ('Lancet,' Jan., 1834.) See POULTICES, &c.

Mustard for the Table. The common practice of preparing mustard for the table with vinegar, or still more, with boiling water, materially checks the development of those peculiar principles on which its pungency or strength almost entirely depends. To economise this substance, we should use lukewarm water only; and when flavouring matter is to be added to it, this is better deferred until after the paste is made. The following forms for 'made mustard' are much esteemed for their flavour:—

Prep. 1. Mustard (ground), 3½ lbs.; water, q. s. to form a stiff paste; in ½ hour, add of common salt (rubbed very fine), 1 lb.; with vinegar, grape juice, lemon juice, or white wine, q. s. to reduce it to a proper consistence.

2. To the last add a little soluble cayenne pepper or essence of cayenne.

3. (Lenormand.) Best flour of mustard, 2 lbs.; fresh parsley, chevril, celery, and tarragon, of each, ½ oz.; garlic, 1 clove; 12 salt anchovies; (all well chopped;) grind well together, add of salt, 1 oz.; grape juice or sugar, q. s. to sweeten; with sufficient water to form the mass into a thinnish paste by trituration in a mortar. When put into pots, a red-hot poker is to be thrust into each, and a little vinegar afterwards poured upon the surface.

4. (MOUTARDE A L'ESTRAGON.) From black mustard seed (gently dried until friable, and then finely powdered), 1 lb.; salt, 2 oz.; tarragon vinegar, q. s. to mix. In a similar way the French prepare several other 'mustards,' by employing vinegars flavoured with the respective substances, or walnut or mushroom ketchup, or the liquors of the richer pickles.

5. (MOUTARDE SUPERBE.) Salt, 1½ lb.; scraped horseradish, 1 lb.; garlic, 2 cloves; boiling vinegar, 2 galls.; macerate in a covered vessel for 24 hours, strain, and add of flour of mustard, q. s.

6. (Patent.) Black ginger (bruised), 12 lbs; common salt, 18 lbs.; water, 15 galls.; boil, strain, and add to each gallon, flour of mustard, 5 lbs.

MUSTARD LEAVES (Rigollot's) are made by spreading moistened mustard on paper, and drying.

MUS'TINESS. See MALT LIQUORS and WINES.

MU'TAGE. The term applied to the 'matching' of grape must to arrest the progress of fermentation. See ANTIFERMENT, MATCHES, &c.

MUT'TON. The flesh of sheep. That of the first quality is "between four and five years old; but at present it is rarely got above three, and often under two. The flesh ought to be of a darkish, clear, red colour, the fat firm and white, the meat short and tender when pinched, and it ought not to be too fat." The flesh of the 'Southdown wether' is esteemed the finest flavoured. Mutton is one of the most wholesome of the 'red meats,' and in commercial importance is second only to beef.

MY'COSE. A peculiar variety of sugar, extracted by alcohol from ergot of rye. It crystallises in colourless prisms, and is distinguished from cane sugar by not reducing the acetate of copper, when boiled with a solution of that salt.

MYRICIN. The portion of bees' wax which is least soluble in alcohol, and saponified with difficulty.

MYRISTIC ACID. $HC_{14}H_{27}O_2$. A monobasic fatty acid, obtained by the saponification of myristin. It melts at 120° Fahr.

MYRIS'TIN. $C_{45}H_{86}O_6$. *Syn.* SERICINE. The white, solid portion of the expressed oil of nutmegs, which is insoluble in cold alcohol. See MYRISTIC ACID.

MYROLÉS. In French pharmacy, solutions of oleaginous or resinous substances in the volatile oils.

MYRON'IC ACID. $HC_{10}H_{18}NS_2O_{10}$. Bussy has given this name to an inodorous, bitter. non-crystallisable acid, obtained by him from black mustard, in which it exists as myronate of potassium. It is soluble in water and alcohol.

MYROSIN. *Syn.* EMULSIN OF BLACK MUSTARD. A name given by Bussy to a peculiar substance, soluble in water, and which possesses the power of converting myronic acid, in the presence of water, into the volatile oil of mustard seed.

MYROSPERMIN. The name given by Richter to the portion of the oil of balsam of Peru, which is soluble in alcohol.

MYROX'ILIN. The name given by Richter to the portion of the oil of balsam of Peru which is insoluble in alcohol. By oxygenation, it forms myroxilic acid.

MYRRH. *Syn.* MYRRHA (B. P., Ph. L. E. & D.), L. "Gum resin exuded from the bark of *Balsamodendron myrrha.*" (B. P., Ph. L.)

Pur.—1. Triturate a small quantity of the powder of the suspected myrrh with an equal amount of chloride of ammonium, adding, water, gradually; if the whole is readily dissolved, the myrrh is genuine; otherwise it is sophisticated with some inferior substance. (Righini.)—2. When incinerated, it should not leave more than 3½ to 4⅞ of ashes.

Uses, &c. Myrrh is a stimulating aromatic bitter and tonic, and is given in several diseases accompanied by relaxation and debility; especially in excessive secretions from the mucous membranes, and in disorders of the digestive organs. *Externally*, as an ingredient in dentrifices and rashes, in caries of the teeth, spongy and ulcerated gums, &c. *Dose.* 10 to 30 grs.; either alone or combined with aloes or chalybeates.

NAILS (The) should be kept clean by the daily use of the nail-brush and soap-and-water. After wiping the hands, but whilst they are still soft from the action of the water, the skin, which is apt to grow over the nails, should be gently loosened and pressed back, which will not only preserve them neatly rounded, but will prevent the skin cracking around their roots (agnails, nail-springs), and becoming sore. The free ends or points of the nails should be pared about once a week; and biting them should be particularly avoided, as being at once destructive to their beauty and usefulness. "The (free) edge of the scarf-skin should never be pared, the surface of the nail never scaped, or the nails cleaned with any instrument whatever saving the nail-brush." (Eras. Wilson.)

The consequences of wearing a shoe that is obviously too short for the foot are thus described by the above authority. "In this case Nature gives us warning, by means of her agent, pain, that such a proceeding is contrary to her laws. We stop our ears, and get accustomed to the pain, which, perhaps, is not severe, and soon goes off; the shoes get a scolding for their malice, and we forget all about it for a time. But does Nature check her course to suit the convenience of thoughtless man? No, no. In a short time we find that the nail, intercepted in its forward course, has become unusually thick and hard, and has spread out so much upon the sides, that it is now growing into the flesh, and so makes a case for the doctor. Or, perhaps, the continuance of pressure may have inflamed the sensitive skin at the root, and caused a sore and painful place there. And instances are by no means infrequent in which the power of production of the nail at the root becomes entirely abrogated, and then it grows in thickness only."

When the nails are stained or discoloured, a little lemon juice, or vinegar-and-water, is the best application. Occasionally a litle pumice-stone, in impalpable powder, or a little 'putty powder,' may be used along with water and a piece of soft leather or flannel for the same purpose. The frequent employment of these substances is, however, injurious to the healthy growth of the nail.

NANKEEN′. The coloured cotton cloth which bears this name was originally brought from Nankin, the ancient capital of China, and was prepared from a native cotton, of a brownish-yellow hue. It is now successfully imitated in England, and at the present time the English manufacturers supply the Canton market. In this country the colour is generally given to the cloth by successive baths of sulphate of iron and crude carbonate of soda or lime water.

NANKEEN DYE. The liquid sold under this name in the shops is a solution of annotta. It is employed to dye white calicoes of a nankeen colour; but chiefly to restore the colour of faded nankeen clothing.

NAPH′THA. *Syn.* MINERAL NAPHTHA; NAPHTHA, L. A name given to the limpid and purer varieties of PETROLEUM (which *see*), or ROCK OIL, which exudes from the surface of the earth in various parts of the world.

Prop. Naphtha possesses a penetrating odour and a yellow colour, but may be rendered colourless by distillation; it usually begins to boil at a temperature of about 180° Fahr.; but, being a mixture of several different hydrocarbons, it has no fixed boiling-point; it is very inflammable; it does not mix with water, but imparts to that fluid its peculiar taste and smell; mixes with alcohol and oils, and dissolves sulphur, phosphorus, camphor, iodine, most of the resins, wax, fats, and spermaceti; and forms with caoutchouc a gelatinous varnish, which dries with very great difficulty.

Pur. Mineral naphtha is very frequently adulterated with oil of turpentine, a fraud which may be detected by—1. The addition of some oil of vitriol, which will, in that case, thicken and darken it.—2. Hydrochloric acid gas passed through the liquid for an hour will occasion the formation of hydrochlorate of camphine, either at once or after a few hours' repose, even if only 5% of oil of turpentine is present. (Dr. Bolley.)—3. If a few grains of iodide of potassium and a little water are rubbed with tha suspected sample, the colour of the water should continue unchanged; the presence of $\frac{1}{300}$th part of oil of turpentine will cause it to assume a red or orange colour. (Saladin.)

Uses. Naphtha is chiefly employed for the purposes of illumination, as a solvent for India rubber, and in the preparation of a very superior black pigment. It has been highly spoken of as a remedy for cholera, by Dr. Andreosky, a Russian physician. See PETROLEUM, and *below*.

Naphtha, Coal-tar. *Syn.* NAPHTHA, COAL N. A mixture of volatile hydrocarbons, obtained by distilling coal-tar. It is one of the first products which comes over, and flows from the still as crude coal naphtha. To obtain rectified coal naphtha, this crude liquid is distilled, and the product agitated with 10% of concentrated sulphuric acid; when cold, the mixture is treated with 5% of peroxide of manganese, and the upper portion is submitted to further distillation. The specific gravity of this purified product is ·850. It is extentively used as a solvent of caoutchouc, and other allied substances, also of resins for the preparation of varnishes. By repeated purification and fractional distillation, benzol, the chief and most important constituent of coal naphtha, is obtained. See BENZOLE.

Naphtha, Wood. See PYROXYLIC SPIRIT.

NAPH′THALIN. $C_{10}H_9$. *Syn.* NAPHTHALINE, NAPHTHALENE. A white crystallizable, odorous, volatile substance, obtained from coal-tar.

Prep. The last portion of the volatile oily product is collected separately, and allowed to repose, when crude naphthalin separates in the solid state. By pushing the distillation until the residuum in the still begins to char, a further portion of dark-coloured naphthalin may be obtained. It is purified by resublimation a second, or even a third time.

Prop., *&c.* Soluble in alcohol and ether; slightly soluble in boiling water; melts at 176° Fahr.; boils at 413°; highly inflammable, burning with a red and smoky flame; with sulphuric acid, it unites to form sulphonaphthalic acid. By the action of nitric acid upon naphthalin, numerous substances may be formed, the most interesting being nitronaphthalin. Naphthalin has lately been extensively employed as a stimulating expectorant. *Dose.* 5 to 20 grs.; or, preferably, ½ gr., frequently. *Externally*, made into an ointment, in dry tetters, psoriasis, &c.

NA'PLES YEL'LOW. See YELLOW PIGMENTS.

NAR'CEIA. $C_{23}H_{29}NO_9$. *Syn.* NARCEINA, NARCEIA. A peculiar substance discovered by Pelletier in opium. It is obtained from the aqueous solution of opium, after it has been freed from morphia, and narcotina by ammonia, by adding to it hydrate of lime, or preferably, baryta. On boiling the filtered solution to expel the ammonia, and evaporating the liquid, crystals of narceine are gradually deposited. It may be purified by solution in hot alcohol and recrystallisation.

Prop., *&c.* White, silky, acicular prisms; neutral; inodorous; bitter; pungent; soluble in 375 parts of water at 60°, and in 230 parts at 212° Fahr.; insoluble in ether; does not neutralize the acids, and is destitute of basic properties. It is distinguished from morphia by its easier fusibility (198°), and by forming a blue liquid with the dilute mineral acids, which on gradual dilution changes to violet and rose red, and ultimately becomes colourless. It does not strike a blue colour with ferric chloride, like morphia, but forms a blue compound with iodine which is decomposed by boiling water. It appears to be inert, and has not been applied to any useful purpose.

NAR'COTICS. *Syn.* STUPEFACIENTS; NARCOTICA, STUPEFACIENTIA, L. Medicines which produce drowsiness, sleep, and stupor. In small doses, narcotics mostly act as stimulants, but in larger ones they produce calmness of mind, drowsiness, and torpor; and in poisonous doses, delirium, coma, and death. The general objects in the administration of these agents are the production of sleep and the alleviation of pain. Their action is modified to a greater degree by idiosyncracy and habit than that of, perhaps, any other class of medicines. Hence the care necessary in their administration. Alcohol, camphor, chloroform, chloral hydrate, ether, foxglove, hemlock, henbane, morphia, opium, and tobacco, are narcotics.

NAR'COTINA. $C_{22}H_{23}NO_7$. *Syn.* NARCOTINE, L.; SEL D'OPIUM, MATIERE DE DEROSNE, Fr. A peculiar crystalline substance, found by Derosne in opium, and on which its stimulant property was at first supposed to depend.

Prep. 1. From opium exhausted of soluble matter by cold water, by treating it with water acidulated with acetic or hydrochloric acid, filtering, neutralizing with ammonia, and dissolving the washed precipitate in boiling alcohol; the narcotine is deposited as the liquid cools, and may be purified by solution in ether.

2. By acting on opium, previously exhausted by cold water, with ether.

Prop., *&c.* White, inodorous, fluted or striated prisms; neutral to test paper; insoluble in cold water; sparingly soluble in boiling water; freely soluble in boiling alcohol and in ether. It is only feebly basic.

Narcotine is distinguished from morphia by its insipidity, solubility in ether, insolubility in alkalies, giving an orange tint to nitric acid, and a greasy stain to paper when heated on it over a candle. Another test for narcotina, said by Orfila to be characteristic, is to add to a little of the suspected substance a drop or two of oil of vitriol, and then to add a very small fragment of nitrate of potassium; the liquid speedily acquires a deep blood-red colour if nicotina is present. Morphia treated in the same way strikes a brown or olive-green colour.

Obs. The physiological action of narcotina is differently stated by different authorities. 1 gr. of it, dissolved in olive oil, killed a dog in 24 hours; but 24 grs. dissolved in acetic acid were given with impunity. (Magendie.) In the solid state it is inert; 120 grs. at a dose scarcely produce any obvious effects. (Bally.) Scruple doses have been given without injury. (Dr. Roots.) It has been recently proposed as a substitute for quinine in the cure of agues. For this purpose the sulphate or hydrochlorate is preferable. 200 cases of intermittent and remittent fevers have been thus successfully treated in India. (Dr. O'Shaughnessy.)—*Dose.* 3 to 10 grs., as an antiperiodic sedative, &c.

Turkey opium contains about 1%, and East Indian opium, about 3%, of narcotine.

NA'TRIUM. See SODIUM.

NA'TRON. Native carbonate of soda.

NAU'SEA. See SICKNESS.

NAU'SEANTS. *Syn.* NAUSEANTIA, L. Substances which induce an inclination to vomit, without effecting it. See EMETICS.

NEC'TAR. The fabled drink of the mythological deities. The name was formerly given to wine dulcified with honey; it is now occasionally applied to other sweet and pleasant beverages of a stimulating character. The following LIQUEURS are so called:—

Prep. 1. Chopped raisins, 2 lbs.; loaf sugar, 4 lbs.; boiling water, 2 galls.; mix, and stir frequently until cold, then add 2 lemons, sliced; proof spirit (brandy or rum), 3 pints; macerate in a covered vessel for 6 or 7 days, occasionally shaking, next strain with pressure, and let the strained liquid stand in a cold place for a week to clear; lastly, decant the clear portion, and bottle it.

2. Red ratifia, 3 galls.; oils of cassia and carraway, of each, 25 drops; (dissolved in) brandy, ½ pint; orange wine, 1 gall.; sliced oranges, 6 in no.; lump sugar, 2 lbs.; macerate for a week, decant and bottle. See Arrack (Factitious).

NE'GUS. A well-known beverage, so named after its originator and patron, Colonel Negus. It is made of either port or sherry wine, mixed with about twice its bulk of hot water, sweetened with lump sugar, and flavoured with a little lemon juice and grated nutmeg, and a small fragment only of the yellow peel of the lemon. The addition of about 1 drop of essence of ambergris, or 8 or 10 drops of essence of vanilla, distributed between about a dozen glasses, improves it.

NEPEN'THE. A drink calculated to banish the remembrance of grief. In the "Odyssey" Homer describes Helen as administering it to Telemachus. Nothing is known respecting the composition of the ancient nepenthe. The name is applied to a preparation of opium by many old writers, and is now employed by a Bristol firm to designate a preparation resembling in all essential points Battley's 'LIQUOR OPII SEDATIVUS.'

NER'VOUSNESS. The indescribable derangement of health, and the complication of disagreeable sensations which are popularly described under this name, quite as much deserve the serious attention of both patient and physician as any other affection to which the human frame is liable. Although, in itself, not a definite disease, it is indicative of the vital system being out of order, that its energies are failing or overtasked, and that the functions of some of its organs are languidly or imperfectly performed. This condition, if not removed, may gradually lead to the development of actual disease, and imperil life if the conditions whereon it is dependent be not detected and subdued.

The *treatment* of nervousness consists mainly in restoring the healthy action of the stomach and bowels, and in the use of proper exercise, especially in the open air. The stomach should not be overloaded with indigestible food, and the bowels should be occasionally relieved by the use of some mild aperient. Mental as well as bodily relaxation should be sought, and the pleasures, without the vices of society, should be indulged in as discretion and inclination may direct. Abernethy's injunction to a nervous and dyspeptic lady, "Dismiss your servants, madam, and make your own beds," should be recollected by all, and may be taken as a proof of the importance that eminent surgeon attached to exercise; his advice to the indolent and nervous dyspeptic should not be forgotten, "Live on sixpence a day—and earn it." See Exercise, Flatulence, Hypochondriasis, Hysterics, Indigestion, &c.

NESSLER'S TEST for ammonia, &c. This, the most delicate test for ammonia, was devised by Nessler. It is prepared by saturating a solution of iodide of potassium with the biniodide of mercury, and then adding a weak solution of hydrate of sodium. The addition of a few drops of this solution, to one containing ammonia, produces a yellowish tint when only a trace of ammonia is present, but a dark brown precipitate when the ammonia is present in larger quantity. The composition of the precipitate may be represented thus: NHg_2I. A modification of this test is applied to the detection of wood spirit in common alcohol. A dilute solution of the iodides in question in pure alcohol is formed, in the proportion of 2 or 3 grs. of the salts to 100 c.c. of alcohol. About 4 c.c. of the suspected alcohol are taken, to which are added 2 or 3 drops of the best solution, a few drops of alcoholic ammonia, and lastly, a little alcoholic potash; if wood spirit be present, the solution will remain clear, but if the alcohol be pure, the characteristic reddish brown precipitate will appear. The precipitate is soluble in acetone, which is always present in wood spirit.

NET'TLE RASH. See Rashes.

NEURAL'GIA. Literally, pain in a nerve. "Various parts of the body are liable to be affected with excruciating pain, which is quite independent of any inflammation of the part, and which may often be traced in the course of the nerves." These affections constitute neuralgia. One of the most distressing forms of this disease is FACIAL NEURALGIA or TIC DOULOUREUX (NEURALGIA FACIALIS), which, when it assumes a marked intermittent character, is popularly known as 'FACE AGUE.' Sometimes it attacks the nerves of the female breast; or those of the hand, feet, hip, or loins, in which cases it is often confounded with acute rheumatism of those parts, occurring towards the inner extremity of the eyebrow and extending over the forehead, it is known as "Brow-ague."

The treatment, when neuralgia is symptomatic of any other affection, must be directed to the primary disease. When it is idiopathic, or an independent affection, powerful tonic medicines and powerful local counter-irritation are generally found the most successful remedies. Of tonics, carbonate of iron and bark (both in very large doses) are generally preferred; the last, more particularly when the affection is of an intermittent kind. As a counter-irritant, caustic ammonia has been much relied on. When all other means fail, a current of mild streaming electricity through the part will often give immediate relief. In the present day quinine in large doses is much depended on, although the affection should not present the intermittent type.

NEUTRALIZA'TION. The admixture of an alkali or base with an acid in such proportions that neither shall predominate. A neutral compound neither turns red litmus paper blue, nor blue litmus paper red.

NICK'EL. Ni. *Syn.* NICKELIUM, L. A metal obtained from kupfernickel, a native arsenide of nickel found in Westphalia; also from nickel-speiss, an impure arsenio-sulphide of nickel left after the manufacture of cobalt blue from its ores.

Prep. The powdered ore is roasted first by itself, and next with charcoal powder, until all the arsenic is expelled, and a garlic odour ceases to be evolved; the residuum is mixed with sulphur, 3 parts, and potassium hydrate, 1 part, and the compound is melted in a crucible with a gentle heat; the fused mass, when cold, is reduced to powder, edulcorated with water, dissolved in sulphuric acid mixed with a little nitric acid, and precipitated with potassium carbonate; the precipitate (nickelous carbonate) is washed, dried, mixed with powdered charcoal, and, lastly, reduced by the heat of a powerful furnace.

When nickel predominates in the ore, after the arsenic, iron, and copper have been separated, ammonia is digested in the mixed nickelous and cobaltous oxides, and the resulting blue solution, after dilution with boiled pure water, is treated with potassium hydrate until the colour disappears, when the whole is put into an air-tight vessel, and set it aside for some time. The powder (nickelous hydrate) which subsides, after edulcoration, is mixed with charcoal, and reduced by fusion in a crucible containing some crown glass.

On the small scale, for chemical purposes, pure nickel is best obtained by moderately heating nickelous oxalate in a covered crucible lined with charcoal.

Prop. White; hard; malleable; magnetic; capable of receiving the lustre of silver; sp. gr., when hammered, about 8·82; fusibility between that of manganese and iron; it is not oxidized in the air; and is little attacked by dilute acids unless when nitric acid is present; this last acid dissolves it freely. With the acids, &c., it forms numerous compounds, most of which may be prepared by the direct solution of the carbonate. A specimen of the metal reduced from the pure oxide in a current of hydrogen was beautifully white and silvery; its sp. gr. was 8·575, and it was almost as soft as copper.

Tests. The salts of nickel in the anhydrous state are for the most part yellow; when hydrated, green,—and furnish solutions possessing a pale-green colour. Solutions of its salts exhibit the following reactions:—Alkaline hydrates give a pale apple-green precipitate, insoluble in excess, but soluble in a solution of carbonate of ammonium, yielding a greenish-blue liquid. Ammonia gives a similar precipitate, soluble in excess, yielding a deep purplish-blue solution. The presence of ammonium salts or free acids interferes with this reaction. Cyanide of potassium produces a green precipitate, soluble in excess, forming an amber-coloured liquid, which is reprecipitated by hydrochloric acid. This last precipitate is scarcely soluble in excess of the acid in the cold, but readily so upon boiling the liquid. Ferrocyanide of potassium gives a greenish-white precipitate. Sulphuretted hydrogen occasions no change in solutions of nickel containing free mineral acid; but in alkaline solutions gives a black precipitate. Sulphide of ammonium in neutral solutions gives a black precipitate, soluble with difficulty in hydrochloric acid; but freely soluble in aqua regia.

Estim. Nickel may be thrown down from its ore in the form of either carbonate or hydrate, and after ignition may be weighed as oxide, each grain of which is equal to $\frac{4}{5}$ gr. of pure nickel; or, more accurately, ·7871 gr.

According to Rose, nickel may be separated from cobalt as follows:—The mixed metals are dissolved in considerable excess of hydrochloric acids, and the solution is diluted with a very large quantity of water; a current of chlorine is then passed through the liquor for several hours, and the upper part of the flask is left filled with the gas after the current has ceased; barium carbonate is next added, in excess, the whole digested together, with frequent agitation for 15 or 18 hours, and then thrown on a filter. The filtrate yields pure nickelous oxide by precipitation with hydrate of potassium; whilst the residuum on the filter, after being washed in water, dissolved in hot hydrochloric acid, and the barium precipitated with sulphuric acid, furnishes, with hydrate of potassium, a precipitate of cobaltous hydrate, free from nickel, which, when washed and dried, is reduced in a platinum or porcelain crucible by hydrogen gas.

Uses. Nickel is chiefly employed in the manufacture of German silver. Some of its salts have been recently introduced into medical practice, and appear likely to prove most valuable additions to the materia medica. It has also been recently used for deposition by electrolysis on other metals, forming a hard, brilliant, non-tarnishing coating.

Nick'elous Ac'etate. $Ni(C_2H_3O_2)_2$. *Syn.* NICKELII ACETAS, L. *Prep.* By neutralizing acetic acid with nickelous carbonate, and gently concentrating by evaporation, so that crystals may form. Small green crystals, soluble in 6 parts of water.

Nickelous Car'bonate. $NiCO_3$. *Syn.* NICKELII CARBONAS, L. *Prep.* This salt may be obtained in the manner described above in connection with the preparation of metallic nickel, or by simply adding carbonate of sodium to a solution of nickelous chloride or sulphate, but in this case some hydrate is precipitated along with it. The following is another formula which produces a nearly pure carbonate, but one which may still contain a little cobalt, the entire separation of which is a matter of extreme difficulty, and can best be effected in the manner recommended by Rose, described above:—

The mineral (crude speiss or kupfernickel) is broken into small fragments, mixed with from one fourth to one half its weight of iron filings, and the whole dissolved in aqua regia; the solution is gently evaporated to dryness, the residue treated with boiling water, and the insoluble ferrous arseniate removed by filtration; the liquid is next acidulated with hydrochloric acid, treated with sulphuretted hydrogen, in excess, to precipitate the copper, and, after filtration, is boiled with a little nitric acid, to bring back the iron into ferric salts; to the cold and largely diluted liquid a solution of bicarbonate of sodium is gradually added, and the ferric oxide separated by filtration; lastly, the filtered solution is boiled with carbonate of sodium in excess, and the pale green precipitate of carbonate collected, washed, and dried.

Uses, &c. It is freely soluble in the acids, and is chiefly employed to prepare the salts and other compounds of nickel.

Nickelous Chlo″ride. $NiCl_2$. *Syn.* NICKELII CHLORIDUM, L. *Prep.* From nickelous carbonate and hydrochloric acid, as the acetate. Small green crystals, of the formula $NiCl_2,9Aq.$, which are rendered yellow and anhydrous by heat, unless they contain cobalt, when the salt retains a tint of green.

DOUBLE CHLORIDES. Nickelous chloride unites with the chlorides of ammonium, potassium, and sodium, to form pale green crystallizable salts, which have been used for depositing nickel in iron, lead, copper, &c.

Nickelous Hy′drate. $Ni(HO)_2$. By precipitating a soluble salt of nickel with caustic potassa. Hydrated. An ash-gray powder, freely soluble in acids, forming the ordinary salts of nickel.

Nickelous Ox′alate. NiC_2O_4. *Syn.* NICKELII OXALAS, L. *Prep.* By adding a strong solution of oxalic acid to a like solution of nickelous sulphate, and collecting the pale bluish-green precipitate which forms after a time. *Used* to prepare both metallic nickel and its oxide.

Nickelous Oxide. NiO. *Syn.* PROTOXIDE OF NICKEL. *Prep.* 1. By heating the nitrate, carbonate, or oxalate, to redness in open vessels. Anhydrous.

Nickelic Oxide. Ni_2O_3. *Syn.* SESQUIOXIDE OF NICKEL, PEROXIDE OF NICKEL. *Prep.* By passing chlorine through water holding the hydrate in suspension; or by mixing a salt of nickel with bleaching powder. An insoluble, black powder, which is decomposed by heat.

Nickelous Sulphate. $NiSO_4$. *Syn.* SULPHATE OF NICKEL. *Prep.* Dissolve nickelous carbonate or oxide in dilute sulphuric acid, evaporate down, and crystallize. Pale green prismatic crystals, and of the formula $NiSO_4,7Aq.$, or small pale green octrahedrous, when crystallized at a higher temperature, containing $NiSO_4,6Aq$.

Nickelous and Potassium Sulphate. $NiSO_4K_2SO_4,6Aq$. *Syn.* DOUBLE SULPHATE OF NICKEL AND POTASSIUM. *Prep.* By crystallising a mixture of nickelous and potassium sulphates. Pale green crystals, readily soluble in water. Sodium and ammonium sulphates form similar compounds with nickelous sulphate.

NICK′EL SIL′VER. See GERMAN SILVER.

NIC′OTINE, Nicotina. $C_{10}H_{14}N_2$. *Syn.* NICOTIA, L. A volatile base, discovered by Reiman and Posselt in tobacco.

Prep. (Ortigosa.) Infuse tobacco leaves for 24 hours in water acidulated with sulphuric acid, strain, evaporate to a syrup, add ⅙ of its volume of a strong solution of potassa, and distil in an oil bath at 288°, occasionally adding a little water to assist the process, and prevent the too great concentration of the solution of potassa in the retort; next saturate the distilled product with oxalic acid, evaporate to dryness, digest in boiling absolute alcohol, evaporate the resulting tincture to a syrup, and decompose the oxalate of nicotine thus obtained by adding potassa to it in a close vessel, and agitate the mass with ether, repeating the process with more ether until all the nicotine is dissolved out; lastly, distil the mixed ethereal solution in an oil bath. At first ether comes over, then water, and, lastly, nicotina, which, towards the end of the process, assumes a yellowish tint.

2. (Schloesing.) This chiefly differs from the preceding by directing the concluding distillation to be conducted in a retort, by the heat of an oil bath, at the temperature of 284° Fahr., in a current of hydrogen, for 12 hours; after which, by raising the heat to 356° Fahr., the nicotine distils over pure, drop by drop.

Prop., &c. Nicotina is a colourless, volatile liquid; highly acrid and pungent; smelling strongly of tobacco; boiling at 375° Fahr. (482°—Pereira); soluble in water, ether, alcohol, and oils; and combining with the acids, forming salts, many of which are crystallizable. It is a frightful poison; ¼ of a drop will kill a rabbit; a single drop will kill a large dog. Nicotina is the substance which was employed by the Count Bocarmé for the purpose of poisoning his brother-in-law, Gustave Fougnies, the particulars of which were developed in the celebrated trial, in Belgium, of that nobleman, in 1851. Good Virginia and Kentucky tobacco, dried at 212° Fahr., contain from 6% to 7% of nicotina; Havannah tobacco (*cigars*) less than 2%. (Schloesing.)

NIGHT′MARE. *Syn.* INCUBUS, EPHIALTES, L. The common causes of nightmare are indigestion and the use of narcotic and intoxicating substances. Its prevention consists in the selection of proper food, and in duly attending to the state of the stomach and bowels. Heavy and late suppers should be particularly avoided, as well as all articles of diet that are of difficult digestion, or apt to induce flatulency. When it arises from strong drink, tobacco, or opium, these should be abandoned, or employed in smaller quantities. A teaspoonful of aromatic spirits of ammonia, magnesia, or bicarbonate of soda, taken in a glass of cold water on going to bed, is a good and simple preventive. In cases accompanied by restlessness, a few drops of laudanum or tincture of henbane may be added. An occasional aperient is also excellent. See CHAMOMILE.

NIGHT'SHADE (Deadly). *Syn.* BELLADONNA (B. P., Ph. L. E. & D.). "The leaf, fresh and dried (leaves and root—Ph. D.), of *Atropa belladonna*, Linn." "The fresh leaves and branches to which they are attached; also the leaves separate from the branches, carefully dried, of *Atropa belladonna*, gathered, when the fruit has begun to form, from wild or cultivated plants in Britain" (B. P.). "Oval, acute, very perfect, glabrous, when bruised exhaling a disagreeable odour. The herb which grows spontaneously in hedges and uncultivated places is to be preferred to that which is cultivated in gardens." (Ph. L.)

Belladonna is a powerful narcotic, and is used as an anodyne, antispasmodic, and discutient, in a variety of diseases,—neuralgia, arthritic pains, migratory rheumatic pains, spasmodic rigidity and strictures, angina pectoris, hooping-cough, fevers, phthisis, &c.; also as a prophylactic of scarlet fever, as a resolvent in enlarged and indurated glands, to produce dilatation of the pupil, &c., &c.—*Dose.* Of the powder, commencing with 1 gr., gradually and cautiously increased until dryness of the throat or dilation of the pupil occurs, or the head is affected. See ATROPIA.

NIGHTSHADE (Woody). *Syn.* BITTERSWEET; DULCAMARA (B. P., Ph. L. E. & D.), L. The "new shoots (caules) of *Solanum Dulcamara*, Linn." "The dried young branches of the *Solanum Dulcanara* (Bittersweet), from indigenous plants which have shed their leaves" (B. P.). "It is to be collected in autumn, after the leaves have fallen." (Ph. L.) Diaphoretic, diuretic, and (in large doses) narcotic. See INFUSION OF DULCAMARA.

NIO'BIUM. See TANTALUM.

NIP'PLES (Sore). The most common form of this affection is that termed "chapped nipples," by nurses. As a preventive measure, the part may be moistened morning and evening, for some weeks before the period of lactation, with a little rum or brandy, which is more effective if slightly acidulated with a few drops of dilute sulphuric acid. Some persons employ tincture of tolu, or compound tincture of benzoin (Friar's balsam) for this purpose.

When chaps, cracks, or like sores, arising from lactation, are once developed, one of the safest and most effective remedies is tincture of catechu, applied 3 or 4 times a day, by means of a camel-hair pencil.

The celebrated nostrum of Liebert for cracked nipples, "Cosmétique infaillible et prompt contre les gerçures ou crevasses aux seins et autres," is a lotion formed of 10 grs. of nitrate of lead dissolved in 4 fl. oz. of rose water, and tinged with a little cochineal. The parts are moistened with the liquid, and are then covered with fine leaden nipple-shields, two of which are provided for the purpose. This is repeated soon after each time the child leaves the breast; and the nipple is carefully washed with a soft sponge and lukewarm water, and gently dabbed dry with a very soft towel, before the infant is again applied to it. This remedy is very successful, and has acquired great popularity and patronage in Brussels, Paris, Frankfort, and other parts. It must be recollected, however, that all applications of an active or poisonous nature should be employed with the greatest possible caution, as, unless unusual care is taken, a portion of the remedy may remain concealed within the delicate pores of the skin, and be sucked off by the infant, to the serious disturbance of its health.

NITRAN'ILINE. This substance is obtained by acting on nitrobenzol with a mixture of fuming nitric acid and oil of vitriol; Dinitrobenzol is formed, which is dissolved in alcohol, and the resulting solution subjected to the reducing action of ammonia and sulphuretted hydrogen, as described under aniline. Nitraniline forms yellow, acicular crystals, little soluble in cold water, but freely soluble in alcohol and ether. Its salts are crystallizable.

NI'TRATE. *Syn.* NITRAS, L. A salt of nitric acid (*e. g.* Ag.NO_3, nitrate of silver). The nitrates are very easily prepared by the direct solution of the metal, or its oxide, or carbonate, in nitric acid, which, in most cases, should be previously diluted with water. By evaporation, with the usual precautions, they may be obtained either in the pulverulent or crystalline form.

The nitrates are characterised by deflagrating when thrown on red-hot coal, or when heated in contact with inflammable substances. See NITRIC ACID, and the respective metals.

NI'TRE. Nitrate of Potassa. See POTASSA.

NI'TRIC ACID. HNO_3. *Syn.* AZOTIC ACID; ACIDUM NITRICUM (B. P., Ph. L. E. & D.); AQUAFORTIS.

Prep. 1. (Ph. E., and Ph. L. 1836.) Purified nitre (dried) and sulphuric acid, equal parts; mix in a glass retort, and distil with a moderate heat, from a sand bath (or naked gas-flame—Ph. E.) into a cool receiver, as long as the fused materials continue to evolve vapours. "The pale yellow acid thus obtained may be rendered nearly colourless (if desired) by gently heating it in a retort." (Ph. E.) Sp. gr. 1·500. In the present Ph. L. this acid is included in the materia medica. (See *below.*)

2. (Ph. D.) The nitrate of potassa is dissolved in water, the solution treated with a little nitrate of silver, filtered, evaporated to dryness, weighed, and then treated as above.

3. Nitrate of soda (cubic nitre, Chili saltpetre) is introduced, in quantities varying between 4 and 10 lbs., into a cylindrical iron retort, which it will only half fill, and after the lid is luted on and the connection made with the condensers, an equivalent of oil of vitriol is poured in through an aperture provided for

the purpose, and the charge is worked off with a gradually increased heat. The condensing apparatus consists of a series of 5 or 6 salt-glazed stoneware receivers, about ¼th part filled with cold water. The product of this process is the strongest brown and fuming 'NITROUS ACID' of commerce (AQUAFORTIS, FUMING NITRIC ACID; ACIDUM NITROSUM, ACIDUM NITRICUM FUMANS), and has usually the sp. gr. 1·45. It is rendered colourless by gently heating it in a glass retort, when it forms COMMERCIAL NITRIC ACID (sp. gr. 1·37 to 1·4.)

4. (PURE MONOHYDRATED NITRIC ACID.) By mixing the strongest commercial acid with about an equal quantity of oil of vitriol; redistilling; collecting apart the first portion which comes over, and exposing it, in a vessel slightly warmed and sheltered from the light, to a current of dry air made to bubble through it until the nitrous acid is completely removed.

Prop. Pure liquid nitric acid is colourless, highly corrosive, and possesses powerful acid and oxygenizing properties. The sp. gr. of the strongest liquid acid (monohydrated nitric acid) has the sp. gr. 1·517 at 60° Fahr. "On boiling nitric acid of different degrees of concentration at the ordinary atmospheric pressure, a residue is left boiling at 249° Fahr., and 29 in. barometer, having a sp. gr. 1·414 at 60° Fahr." (Fownes.) Acid of less density than 1·414 parts with water, and gradually becomes stronger by boiling; but acid of sp. gr. than 1·414 is weakened by exposure to heat. When exposed to intense cold, liquid nitric acid freezes. It is rapidly decomposed, with loss of oxygen, by contact with most organic and many metallic and non-metallic bodies. In many cases these reactions occur with considerable violence, and the production of light and heat.

Pur. The nitric acid of commerce is generally contaminated by hydrochloric acid, nitrous acid, sulphuric acid, or chlorine, or by their soda or potassa salts, and, occasionally, iodine, together with an excess of water. The last is readily detected by the sp. gr., and the others by the appropriate tests. "Colourless. Contains 70% of HNO_3. Sp. gr. 1·42. 90 grs. by weight, mixed with ½ oz. of distilled water, require for neutralisation 1000 grain measures of the volumetric solution of soda. Evaporated, it leaves no residue. Diluted with six volumes of distilled water, it gives no precipitate with chloride of barium or nitrate of silver—indicating absence of sulphuric and hydrochloric acids." (B. P.) 5 measures of acid, sp. gr. 1·5 mixed with 2 of water, condensed into 6¼ measures, and makes the sp. gr. 1·42. "Free from colour. Sp. gr. 1·42. Exposed to the air, it emits very acrid vapours. Totally volatilized by heat. Diluted with 3 times its volume of water, it gives no precipitate with either nitrate of silver or chloride of barium. 100 gr. of this acid (sp. gr. 1·42) are saturated by 161 gr. of crystallized carbonate of soda." (Ph. L.) The Ph. E. states the density of commercial nitric acid is 1·380 to 1·390. "If diluted with distilled water, it precipitates but slightly, or not at all, with solution of nitrate of baryta or nitrate of silver." The best 'double aquafortis' of the shops (aquafortis duplex) has usually the sp. gr. 1·36; and the single aquafortis' (aquafortis simplex), the sp. gr. 1·22; but both are commonly sold at much lower strengths.

Tests.—1. It stains the skin yellow.—2. When mixed with a little hydrochloric acid or chloride of ammonium, it acquires the power of dissolving gold leaf.—3. Morphia, brucia, and strychnia, give it a red colour, which is heightened by ammonia in excess.—4. When placed in a tube, and a solution of protosulphate of iron is cautiously added, a dark colour is developed at the line of junction, which is distinctly visible when only $\frac{1}{24,000}$th part of nitric acid is present. This test may be often conveniently modified by dropping into the liquid a crystal of protosulphate of iron; the fluid immediately surrounding this crystal then acquires a dark brown colour, which disappears upon simple agitation of the fluid, or by heating it.—5. When mixed with a weak solution of sulphate of indigo, and heated, the colour of the latter is destroyed.—6. When saturated with carbonate of potassium or sodium, and evaporated to dryness, the residuum deflagrates when thrown on burning coals.—7. When the mixture of a nitrate with cyanide of potassium, in powder, is heated on a piece of platinum, a vivid deflagration follows, attended with distinct ignition and detonation. (Fresenius.)

The nitrates may all be tested as above by first adding a small quantity of pure sulphuric acid, which will liberate the nitric acid of the salt.

Estim.—The strength of nitric acid may be roughly estimated by its sp. gr.; but more accurately by ascertaining the amount of carbonate of sodium, or other salt of known composition, which is required to neutralize it. To render the assay trustworthy, it must be, in all cases, also tested to detect the presence of impurities. See ACIDIMETRY.

Ant., &c. See ACIDS.

Uses. Nitric acid is employed in assaying, in dyeing, in etching on copper, in the preparation of gun-cotton, oxalic and sulphuric acids, &c. In medicine, it is used as a caustic to corns and warts; and in doses of 1 to 10 drops, in a tumbler of water, in liver complaints, fevers, dyspepsia, syphilis, to remove the effects of mercury, or as a substitute for that drug, &c. Externally, it is employed in the form of baths, lotions, and ointment. Dr. Collier states that a strong lotion of nitric acid is almost a specific in lepra, and several other kindred skin diseases.

Concluding remarks.—The common source of nitric acid is nitrate of potassium, but it may also be obtained from other nitrates by a similar process. Nitrate of sodium is frequently used instead of nitrate of potassium, and is more convenient in some respects, as the residuum is more easily dissolved out of the retort or cylinder. The residuum of the common process with nitre ('sal enixum') is chiefly employed as a flux by the glass-houses, and as a source of potash in the manufacture of alum.

By proper management, nitre yields more than ⅔ of its weight of pure nitric acid, sp. gr. 1·500; and nitrate of soda, its own weight of acid, sp. gr. 1·4.

By the patent process of M. Mallet, dried nitrate of soda is decomposed by dried or monohydrated boracic acid, by heating the two together. The products are liquid nitric acid, which distils over, and biborate of soda (borax), which remains in the retort.

The crude coloured nitric acid of commerce (aquafortis) was originally prepared by distilling a mixture of nitre and copperas, and is still sometimes obtained in this way.

The nitric acid of commerce may be freed from the impurities alluded to above by one or other of the following methods:—

1. By the addition of a little nitrate of silver, as long as it produces any cloudiness, and, after repose, decanting the clear acid, and rectifying it at a heat under 212°. To ensure a perfectly colourless product, a small portion of pure black oxide of manganese should be put into the retort. (Murray.)

2. By agitating the acid with a little red oxide of lead, and then rectifying it, as before.

3. By adding 1% of bichromate of potassa to the acid before rectifying it. This answers well for acid not stronger than sp. gr. 1·48.

4. By rectification at a gentle heat, rejecting the first portion that comes over, receiving the middle portion as genuine acid, and leaving a residuum in the retort. (Ure.)

According to Apjohn and others, the strongest liquid nitric acid, sp. gr. 1·520, is a monohydrate; that of the sp. gr. 1·500, a sesquihydrate; that of 1·486, a binhydrate; and that of 1·244, a quadrihydrate; or containing respectively, 1, 1½, 2, and 4 atoms of water. (See *below*.)

Nitric Acid, Anhy'drous. N_2O_5. *Syn.* NITRIC ANHYDRIDE. This interesting substance was first obtained in a separate form by M. Deville, in 1849.

Prep. (M. Deville.) Nitrate of silver is dried by exposure to a current of dry carbonic acid at a temperature of 356° Fahr., and the tube containing it is then immersed in a water bath heated to 203° Fahr.; pure dry chlorine gas is next passed through the apparatus, and, as soon as the reaction commences, the temperature is reduced to 154° or even 136°, but not lower; the production of crystals in the receiver, which must be cooled by a powerful freezing mixture, soon commences; lastly, the liquid portion of the product is removed by a current of dry carbonic-acid gas.

Prop., &c. Colourless prismatic crystals, which melt at 86° Fahr., boil at about 115°, and at 122° begin to suffer decomposition; added to water, much heat is generated; it rapidly attacks organic bodies, even caoutchouc; sometimes it explodes spontaneously. The process for its preparation is tedious and difficult.

Nitric Acid, Dilute. ACIDUM NITRICUM DILUTUM (B. P., Ph. L. E. & D.), L. *Prep.* 1. (Ph. L.) Nitric acid (sp. gr. 1·42), 3 fl. oz.; distilled water, 17 fl. oz.; mix. Sp. gr. 1·082. "1 fl. oz. is saturated by 154 grs. of the crystals of carbonate of soda." It contains about 12% of pure anhydrous nitric acid.

2. (Ph. E.) Nitric acid (1·500), 1 fl. oz.; distilled water, 9 fl. oz. Or, commercial nitric acid (1·390), 1 fl. oz. 5½ drs.; water, 9½ fl. oz. Sp. gr. 1·077. It contains 11·16% of pure dry nitric acid.

3. (Ph. D.) Nitric acid (1·500), 4 fl. oz.; water, 29 fl. oz. Contains about 9·7% of pure acid. The above are used for convenience in dispensing.—*Dose.* 15 drops to ½ fl. dr., or more. The above must not be confounded with the acidum nitricum dilutum, Ph. D. 1826, which had the sp. gr. 1·280, nor with the following:—

4. (Henry's.) Sp. gr. 1·143; equal in saturating power to hydrochloric acid sp. gr. 1·074, and sulphuric acid 1·135. *Used* in assaying.

5. (B. P.) Nitric acid, 6; distilled water sufficient to make the mixture when cooled to 60° Fahr., measure 31. Contains 15 per cent. of anhydrous nitric acid. *Test.* Sp. gr. 1·101. Six fluid drachms (361·3 grains) by weight require for neutralisation 1000 grain measures of the volumetric solution of soda, and, therefore, contain exactly one equivalent in grains of anhydrous acid, namely, 54 grs. *Use.* Tonic, astringent, lithonlytic.—*Dose.* 10 to 30 minims.

Nitric Acid, Fu'ming. *Syn.* NITROUS ACID‡; ACIDUM NITRICUM FUMANS, L. The red fuming nitrous or nitric acid of commerce is simply nitric acid loaded with nitric peroxide (which *see*). That of the Ph. Bor. is distilled from nitre, 2 parts; oil of vitriol, 1 part.

NI'TRIC ANHY'DRIDE. See NITRIC ACID, ANHYDROUS.

NI'TRIC OX'IDE. See NITROGEN, OXIDES OF.

NI'TRITE. A salt of nitrous acid; *e.g.* KNO_2, nitrite of potassium.

NITRO-BEN'ZOL. $C_6H_5NO_2$. *Prep.* By treating benzol with strong fuming nitric acid, with heat; after the violence of the reaction is over, the liquid is diluted with water, and the heavy oily fluid which separates is collected, washed, and dried.

Prop., &c. Yellowish; very sweet; smells of bitter almonds; insoluble in water; little affected by reagents; boils at 415° Fahr.; sp. gr. 1·209. Heated with an alcoholic solution of caustic potassa, and the mixture submitted to distillation, it yields a red, oily liquid, from which large red crystals of azobenzol separate. These are nearly insoluble in water, freely soluble in alcohol and ether, melt at 149° Fahr., and boil at 559·4° Fahr. BINITROBENZOL is made by dissolving benzol in a mixture of equal volumes of the strongest nitric and sulphuric acids, and boiling the liquid for a few minutes; the crystals dinitrobenzol) which form as it cools are insoluble in water, but are freely soluble in alcohol.

NI'TROGEN. N. *Syn.* AZOTE; NITROGENIUM, AZOTUM, L. A gaseous elementary substance, discovered by Rutherford, in 1722, and found to be a constituent of the atmosphere by Lavoisier, 1755. It is found both in the organic and inorganic kingdoms of nature; it forms about $\frac{4}{5}$, or 78$\frac{0}{0}$ of the bulk of the atmosphere, enters largely into the composition of most animal substances, and is a constituent of gluten, the alkaloids, and other vegetable principles.

Prep. 1. A small piece of phosphorus is placed in a capsule floating on the surface of the water of the pneumatic trough, and after setting it on fire a gas or bell-jar is inverted over it; as soon as the combustion is over, and the fumes of phosphoric anhydride have subsided, the residual gas is washed by agitation with recently boiled distilled water, or with a solution of pure potassa. It may be dried by either letting it stand over fused chloride of calcium, or, what is better, by passing it through concentrated oil of vitriol.

2. A porcelain tube is filled with copper turnings, or, preferably, with spongy copper (obtained by reducing the oxide with hydrogen), and is then heated to redness, a stream of dry atmospheric air being at the same time directed through it. By repeating the process with the same air, and finally passing it over fragments of pumice moistened with strong solution of potassa to absorb carbonic anhydride, the product is rendered quite pure.

3. Chlorine gas is passed into a solution of pure ammonia, care being taken to employ a considerable excess of the latter; the evolved gas, after being dried, is pure nitrogen. There is some danger of producing the explosive compound, chloride of nitrogen, with this process.

4. (Corenwinder.) From solution of nitrate of potassium, 1 volume; concentrated solution of chloride of ammonium, 3 vols.; gently heated together in a flask, and the evolved gas passed through sulphuric acid. Pure.

5. By boiling a solution of nitrite of ammonium, or, which amounts to the same thing, a mixture of one measure of a solution of nitrite of potassium and three measures of a solution of chloride of ammonium. Both solutions must be concentrated. This is the easiest method of preparing nitrogen and of obtaining the gas in a pure state.

Note.—The nitrite of potassium to be employed in this process is best prepared by passing nitrous anhydride, evolved from starch and nitric acid, into a solution of potassa (sp. gr. 1·38) till it imparts an acid reaction to test-paper, and then neutralising by the addition of potassa.

6. From lean flesh digested in nitric acid, at a gentle heat.

Prop., &c. Pure nitrogen is a colourless, odourless, tasteless gas, neither combustible nor capable of supporting combustion or respiration. It is neutral to test-paper, does not affect lime water, and is only slightly absorbed by pure water. Its sp. gr. is ·9713. It is recognised by its purely negative qualities.

Nitrogen, Chlo''ride of. NCl_3. *Syn.* NITROGEN TRICHLORIDE, TERCHLORIDE OF NITROGEN. This compound was discovered by Dulong in 1811, but its nature was first accurately determined by Sir H. Davy.

Prep. (Liebig.) Dissolve chloride of ammonium, 1 oz., in hot water, 12 or 14 oz., and as soon as the temperature has fallen to 90° Fahr., invert a wide-mouthed glass bottle full of chlorine over it. The gas is gradually absorbed, the solution acquires a yellowish colour, and in the course of 15 to 20 minutes yellow, oil-like globules of chloride of nitrogen form upon the surface of the liquid, and ultimately sink to the bottom. The globules, as they descend, should be received in a small leaden saucer, placed under the mouth of the bottle for the purpose.

Prop., &c. Chloride of nitrogen should consequently be only prepared in very small quantities at a time. Both its discoverer and Sir H. Davy met with severe injuries while experimenting on it. Its sp. gr. is 1·653; it volatilises at 160° Fahr., and between 200° and 212° fulminates violently. Contact with combustible bodies at ordinary temperatures immediately causes detonation. ***The explosive power of this compound seems to exceed that of every known substance, not even excepting fulminating silver.*** A minute globule, no larger than a grain of mustard seed, placed on a platina spoon, and touched with a piece of phosphorus stuck on the point of a penknife, immediately explodes, and shivers the blades into fragments, at the same time that the vessel that contains it is broken to pieces. Olive oil, naphtha, and oil of turpentine, have a similar effect. See NITROGEN, IODIDE OF (*below*).

Nitrogen, I'odide of. NI_3. *Syn.* NITROGEN TRI-IODIDE, TERIODIDE OF NITROGEN. A dark brown or black insoluble powder, which is most safely and conveniently prepared by saturating alcohol (sp. gr. ·852) with iodine, adding a large quantity of the strongest pure solution of ammonia, and agitating the mixture; water must now be added, when iodide of nitrogen will be precipitated, and must be carefully washed with cold distilled water. The filter containing the precipitate should be spread out on a sheet of glass and torn into small pieces while the iodide is still moist. The precipitate should be simply exposed to air only.

Prop., *&c.* It detonates violently as soon as it becomes dry, by the slightest pressure or friction, even that of a feather, and often spontaneously; but this explosion is scarcely so powerful as that of the chloride of nitrogen. It also explodes whilst moist, though less readily. It should only be prepared in very small quantities at a time. Recent researches induce the belief that both the above compounds contain hydrogen.

Nitrogen, Ox'ides of. Nitrogen forms 5 distinct compounds with oxygen.

1. **Nitrous ox'ide.** *Syn.* PROTOXIDE OF NITROGEN; LAUGHING GAS; NITROGENII PROTOXYDUM, L. *Prep.* From fused nitrate of ammonium, introduced into a glass retort, or a flask furnished with a bent tube, and then exposed, over a spirit-lamp, or charcoal-chauffer, to a temperature of about 380° Fahr.; the evolved gas may be collected in bladders, gas-bags, a gasometer, or in the pneumatic trough over warm water. The gas may be purified by pouring it through three wash-bottles, one containing water, one a solution of sulphate of iron, and the other a solution of potassa.

Prop., *&c.* Colourless; possesses an agreeable odour, and a sweetish taste; at 32°, under a pressure of 30 atmospheres, it is liquid; this, when exposed under the receiver of a powerful air-pump, changes into a snow-like solid; at —180° Fahr., it is a transparent, colourless, crystalline body; it supports combustion, and is absorbed by cold water. Sp. gr. 1·520. Its most remarkable property is its action on the system when inspired. A few deep inspirations are usually succeeded by a pleasing state of excitement, and a strong propensity to laughter and muscular exertion, which soon subside, without being followed by languor or depression. Its effects, however, vary with different constitutions. From 4 to 12 quarts may be breathed with safety. It produces temporary insensibility to pain, like chloroform or ether; but its use is dangerous when affections of the heart, lungs, or brain are present. This gas is now successfully and extensively employed as an anæsthetic in dental surgery.

Obs. No particular caution is required in preparing the above compound, except the use of too much heat. The temperature should be so arranged as to keep the melted mass in a state of gentle ebullition, and should not be allowed, under any circumstances, to exceed about 500° Fahr. Should white fumes appear within the retort after the evolution of the gas has commenced, the heat should be at once lowered, as, when heated to about 600°, nitrate of ammonia explodes with violence.

Nitrous oxide may also be made in the same way, from crystallised nitrate of ammonia, or by exposing nitric oxide for some days over iron filings moistened with water, but, without great care, the product is not always fit for respiration. When pure, it is colourless, has an agreeable odour, and does not affect solution of nitrate of silver.

2. **Nitric oxide.** NO. *Syn.* DEUTOXIDE OF NITROGEN, NITROUS GAS, BINOXIDE OF NITROGEN; NITROGENII BINOXYDUM, L. *Prep.* By pouring nitric acid, sp. gr. 1·2, on metallic copper, in the form of turnings, clippings, or wire. Effervescence ensues, and nitric oxide is evolved, and may be collected over water or mercury in the pneumatic trough. The residual liquid yields crystals of nitrate of copper on evaporation.

Prop., *&c.* A colourless, tasteless, inodorous, irrespirable, and incombustible gas. In contact with free oxygen, it produces dense orange or red vapours of nitric peroxide (NO_2), which are freely absorbed by water. Nitric oxide is absorbed by a solution of ferrous sulphate, which it turns of a deep brown or nearly black colour, which is removed by boiling. Sp. gr. 1·039.

Nitrous Anhydride. N_2O_3. *Syn.* NITROGEN TRIOXIDE, ANHYDROUS NITROUS ACID. The easiest method of obtaining this compound consists in heating 1 part of powdered starch with 8 parts of nitric acid of sp. gr. 1·25, and passing the evolved gases, first through a drying tube two feet long containing fused chloride of calcium, and then into a dry and empty U-tube cooled to 20° Fahr. by surrounding it with a mixture of pounded ice and crystallized chloride of calcium. Nitrous anhydride thus produced is a blue liquid which emits red fumes, and which on admixture with water at ordinary temperatures is decomposed, producing nitric acid and nitric oxide. If nitrous anhydride be mixed with water at temperatures below 0° Fahr. the two combine, and a blue solution is formed which (probably) contains nitrous acid (HNO_2). See NITROUS ACID.

Nitrogen Pentoxide. N_2O_5. *Syn.* NITRIC PENTOXIDE, NITRIC ANHYDRIDE, ANHYDROUS NITRIC ACID. See NITRIC ACID (ANHYDROUS).

Nitrogen Peroxide. NO_2. *Syn.* NITRIC PEROXIDE, PEROXIDE OF NITROGEN, NITROGEN TETROXIDE, HYPONITRIC ANHYDRIDE. This compound forms the chief constituent of the red fumes which develope on mixing nitric oxide with air or oxygen. It is most readily prepared by heating thoroughly dried nitrate of lead in a retort, and conducting the evolved gases into a U tube surrounded with a freezing mixture of ice and salt for the purpose of condensing the nitric peroxide. If the U tube be perfectly dry, and the cold intense, the nitric peroxide obtained assumes the form of transparent crystals, but the presence of the slightest trace of moisture prevents their formation and produces instead a colourless liquid which, as the temperature rises, acquires a yellow and ultimately a red colour. Nitric peroxide dissolves in nitric acid and turns it of a yellow or red hue. The so-called '*nitrous acid*' or '*fuming nitric acid*' of commerce owes its deep red colour to the presence of this compound. At very low temperatures water converts nitric peroxide into nitric and nitrous acids; at ordinary temperatures it transforms it into nitric acid, nitrous acid, and nitric oxide.

NITRO-HYDROCHLO'RIC ACID. *Syn.* NITRO-MURIATIC ACID; AQUA REGIA, ACIDUM NITRO-HYDROCHLORICUM (B. P.) A. NITRO-MURIATICUM, L.; EAU RÉGALE, Fr. *Prep.* 1. (B. P.) Nitric acid, 3; hydrochloric acid, 4; water, 25. Mix the acids twenty-four hours before adding the water, (This precaution is necessary to allow of the development of the chlorine, and the chloronitrous and chloronitric gases which result from the mutual decomposition of the two acids, and upon which the therapeutic activity of the agent depends). Colourless. Keep the mixture in a cool and dark place.

2. (Ph. D. 1826.) Nitric acid, 1 part; hydrochloric acid, 2 parts; (both 'by measure;) mix in a refrigerated bottle, and keep the mixture in a cold and dark place. *Used* to dissolve gold and platinum; and in medicine, in liver complaints, syphilis, the exanthemata, &c., either internally, in doses of 5 to 15 drops in water, or externally, as a foot- or knee-bath. It is also occasionally employed as a caustic.

3. (AQUA REGIA WITH SAL AMMONIAC.) Nitric acid (sp. gr. 1·2), 16 fl. oz.; sal ammoniac, 4 oz.; dissolve. Occasionally used by dyers; does not keep well.

4. (DYER'S AQUAFORTIS.) Colourless nitric acid (sp. gr. 1·17), 10 lbs.; hydrochloric acid (sp. gr. 1·19), 1 lb.; mix. *Used* by dyers.

NITRO-PRUS'SIDES. A series of salts discovered by Dr. Playfair, and obtained by the action of nitric acid on the ferrocyanides and ferridcyanides. The most important of these salts is the nitroprusside of sodium (Na_2 (NO) $FeCy_5 . 2Aq.$). *Prep.* Dissolve 2 parts of powdered ferrocyanide of sodium in 5 parts of common nitric acid previously diluted with its own volume of water. When the evolution of gas has ceased, digest the solution on a water bath until it no longer yields a blue but a slate-coloured precipitate with ferrous sulphate. Cool the liquid, filter, neutralise the filtrate with carbonate of sodium, and again filter. This filtrate, on evaporation, yields crystals consisting of a mixture of nitro-prusside of sodium and nitrate of potassium; the former, which may be recognised by their rhombic shape and their fine ruling colour, should be picked out and preserved. *Use.* As a test for soluble sulphides, with which nitro-prusside of sodium strikes a beautiful violet tint. According to Playfair this is the most delicate test for alkaline sulphides.

NI'TROUS ACID. HNO_2. See NITROUS ANHYDRIDE under NITROGEN, OXIDES OF.

NI'TROUS OXIDE. See NITROGEN, OXIDES OF.

NODE. *Syn.* NODUS, L. A hard tumour proceeding from a bone, and caused by the swelling of its external membrane. The bones of the leg, forehead, and forearm, are those most commonly attacked. Nodes are generally accompanied with considerable pain, and often with caries and loss of vitality.

NOLI ME TANGERE. See LUPUS.

NOMENCLATURE (Chemical). The following information will doubtless prove useful to many of our readers, as serving to explain terms which are necessarily of frequent occurrence in this work:—

ACIDS.—*a.* When a substance produces only one acid compound, the name of this acid is formed by adding the termination -IC to that of the radical, or to the leading or characteristic portion of it; as sulphuric acid, an acid of sulphur. This is Latinized by changing -IC into ICUM; as, *acidum sulphur*ICUM.—*b.* When a body forms two acid compounds containing oxygen, the name of the one containing the smaller proportion of that substance ends in -OUS; as, *nitr*-OUS acid, which contains 1 atom of nitrogen and 2 of oxygen; *nitr*IC acid, containing 1 atom of nitrogen and 3 of oxygen. In this case the Latin name ends in -OSUM; as, acidum *nitr*OSUM.—*c.* When a substance forms more than two acids with oxygen, the Greek preposition HYPO- (below or under) is prefixed to the name of the acid in -OUS or -IC next above it; as, HYPO*chlorous acid.*—*d.* When a new acid compound of a substance is discovered, containing more oxygen than another acid of the same substance already known, the name of which ends in -IC, the prefix PER- or HYPER- is added; as, PER*iodic acid.* This may be illustrated by the oxygen acids of chlorine:—

Hypochlorous	acid	(*acidum*	*hypochlorosum*)	H Cl O
Chlorous	,,	(,,	*chlorosum*) .	H Cl O_2
Chloric	,,	(,,	*chloricum*) .	H Cl O_3
Perchloric *or* Hyperchloric	,,	(,,	*perchloricum*)	H Cl O_4

OXIDES. The names of these have, in general, reference to the number of atoms of oxygen which they contain. When a metal forms only one basic compound with oxygen, this compound is simply called the oxide of such base; but as most substances form more than one compound with oxygen, certain prefixes are introduced to express the proportions. In such cases it is generally found that one out of the number has a strongly marked basic character, and contains 1 atom of each of its constituents. This is called the oxide, protoxide, or monoxide, and forms the standard to which those both above it and below it are preferred. Thus, supposing M to be the metal we may have:—

Suboxide or dioxide (*suboxydum, dioxydum*	M_2O
Oxide, protoxide, or monoxide (*oxydum protoxydum*)	$M O$
Sesquioxide (*sesquioxydum*)	M_2O_3
Binoxide, dioxide, or deutoxide (*binoxydum*) *deutoxydum*)	$M O_2$
Teroxide or trioxide (*teroxydum, tritoxydum*	$M O_3$
Peroxide (*peroxydum*)	That containing the *largest* proportion of oxygen.

SALTS.—*a.* Acids having names ending in -IC give rise to salts whose names end in ATE; thus *nitr*IC *acid* yields *nitr*ATES, e. g. *nitrate of silver*. -ATE is Latinized by -AS, e. g. *nitrate of silver* becomes *argenti nitr*AS.

b. Acids possessing names ending in -OUS form salts having names ending in -ITE; thus *sulphur*OUS *acid* produces *sulph*ITES, e. g. *sulphite of sodium*. -ITE is Latinized by -IS; *e. g. sulphite of sodium* becomes *sulph*IS.

c. The preceding names are presumed to refer to neutral compounds. In *acid* salts the prefixes noticed above are added to express the preponderance of the acid radical over the metal. $KHSO_4$ is called *acid sulphate of potassium*, BI*sulphate of potassium*, or BI*sulphate of potash*, the neutral sulphate being K_2SO_4.

d. In *basic* salts, or those in which the metal is in excess of the acid radical, the prefixes -SUB and -DI are employed; *e. g.* the formula of *neutral* acetate of lead is $Pb\bar{A}_2$. This salt, when boiled with oxide of lead (a base), furnishes $[Pb\bar{A}_2PbO]$ and $[Pb\bar{A}_22PbO]$. They are both, therefore, *basic* acetates; and to distinguish one from the other the former is called DI*acetate* and the latter TRI*acetate* of lead; *-di* referring to the presence of two atoms of lead and *-tri* to three.

Formerly the salts of the metals of the alkalies and alkaline-earths received names which indicated the existence in them of the oxides of such metals. Thus the terms carbonate of soda, nitrate of potash, carbonate of lime, sulphate of magnesia, names by which these fluids are still designated by some chemists, are now substituted by the more systematic and less speculative names of carbonate of sodium, nitrate of potassium, carbonate of calcium, and sulphate of magnesium. Another, and in the opinion of the editor, a still better system of nomenclature is that in which the metallic or basic radical is mentioned first; *e. g.* calcium sulphate instead of sulphate of calcium, ammonium chloride for chloride of ammonium. When the *same* radicals form more than one series of salts, each series is distinguished by appending the terminations -IC and -OUS to that part of the name which refers to the basic radical; *e. g. mercur*OUS *chloride* ($HgCl$), *mercur*IC *chloride* ($HgCl_2$); *ferr*OUS *sulphate* ($FeSO_4$), *ferr*IC *sulphate* ($Fe_2(SO_4)_3$).

NON-METALLIC BODIES, &c. The names of the compounds formed by the union of the non-metallic elements, and certain other bodies, with the metals and with each other, either terminate in -IDE, Latinized by -IDUM, or in -URET, Latinized by -URETUM; as, *arsen*IDE or *arseni*URET (*arsen*IDUM, *arseni*URETUM), *brom*IDE, *carb*IDE or *carb*URET, *chlor*IDE, *cyan*IDE, *fluor*IDE, *hydr*IDE, *iod*IDE, *sulph*IDE or *sulph*URET, &c. The first of these terminations now prevails among English scientific chemists. The prefixes already noticed are also employed here.

METALS. The names of the metals (those of them, at least, that have been given during the present century) end in -IUM or (less frequently) in -UM; as *potass*IUM, *sod*IUM, *platin*UM. The Latin names of several of the non-metallic elementary bodies also end in -IUM; as, *iodin*IUM, *nitrogen*IUM, &c.

ALKALOIDS. The names of the organic bases which resemble the alkalies in their properties end either in -IA, -NA, or -INE; as, *morph*IA, *quin*A, *strychn*INE. These terminations are now limited, as much as possible, to substances exhibiting basic properties, but were formerly very loosely applied.

Many chemists reject the first two terminations, and apply -INE to every substance of this class; as, *morph*INE, *quin*INE, *anil*INE, &c.

OTHER ORGANIC SUBSTANCES. The names of organic radicles generally terminate in -YL; as, *eth*YL, *meth*YL, *benzo*YL, &c.; they mostly contain carbon, hydrogen, and oxygen. Compounds corresponding to the electro-negative elements have the termination -OGEN, as *cyan*OGEN, *amid*OGEN. Neutral compounds of carbon and hydrogen, mostly liquid, have the termination -OL, or -OLE; as, *benz*OL, *pyr*OLE. Other neutral substances, generally solid, have the termination -IN; as, *paraff*IN, *naphthal*IN., Compounds resembling ammonia, and generally considered as 'substitution compounds' of that body, terminate in -AMINE; as, *ethyl*AMINE, *propyl*AMINE.

The Latin genitive or possessive of the above compounds in—

-as	is	-atis
-is	„	-itis
-icum	„	-ici
-osum	„	-osi
-idum	„	-idi
-otum	„	-oti
-ium	„	-ii
-um	„	-i
-ia -a -na	„	-æ

Ex. Acetas (acetate), acetatis of acetate arsenis, arsenitis; citricum, citrici; arseniosum, arseniosi; iodidum, iodidi; sulphuretum, sulphureti; sodium, sodii; platinum, platini; morphia, morphiæ; quina, quinæ; narcotina, narcotinæ. The genitives of common names vary with the termination. Most of those ending in -a make -æ, and most of those in -us and -um make -i; but there are many exceptions, among which cornu (a horn) and spiritus (spirit) which are unaltered in the genitive singular, may be mentioned as examples.

NORFOLK FLUID. *Prep.* Take of linseed oil, 3 pints; black resin, ½ lb.; yellow wax, 12 oz.; melt, and add, of neat's-foot oil, 1 quart; oil of turpentine, 1 pint. *Used* to preserve and soften leather.

NOR'TUM. An unexamined metal, the oxide of which, according to Svanberg, exists in certain varieties of ZIRCON.

NOS'TRUMS. See PATENT MEDICINES, &c.

NOVAR'GENT. *Prep.* From recently precipitated chloride of silver by dissolving it in a solution of either hyposulphite of sodium or of cyanide of potassium. *Used* chiefly to restore old plated goods. The liquid is rubbed over the metal to be coated with a little prepared chalk, and the part is afterwards polished off with a piece of soft leather. A powder recently sold under the same name is formed by mixing the preceding article with chalk, and drying the mass. It is made into a paste with a little water, spirit of wine, or gin, before applying it.

NOVAUR'UM. From a solution of neutral trichloride of gold, as the last.

NOYAU. *Syn.* CRÊME DE NOYAU. This is a pleasant nutty-tasted liqueur; but from the large proportion of prussic acid which it contains, a small quantity only should be taken at a time.

Prep. 1. Bitter almonds (bruised), 3 oz.; spirit (22 u. p.), 1 quart; sugar, 1 lb.; (dissolved in) water, ¾ pint; macerate for 10 days, frequently shaking the vessel; then allow it to repose for a few days, and decant the clear portion.

2. As the last, but substituting apricot or peach kernels (with the shells, bruised), for the almonds.

3. To either of the above, add of coriander seed and ginger, of each, bruised, 1 dr.; mace and cinnamon, of each, ½ dr.

4. (Wholesale.) To plain cordial, at 54 to 60 u. p., containing 3 lbs. of sugar per gallon, add, gradually, essence of bitter almonds, q. s. to flavour.

5. (CRÊME DE NOYAU DE MARTINIQUE.) Loaf sugar, 24 lbs.; water, 2½ galls.; dissolve, add, of proof spirit, 5 galls.; orange-flower water, 3 pints; bitter almonds (bruised), 1 lb.; essence of lemons, 2 drs.; as above. See LIQUEURS.

NUR'SING. Milk is the natural food of the mammalia during the earlier period of their existence. It contains all that is necessary for the nourishment of their bodies, and on it they thrive and grow. Its secretion only actively commences at the time when it is required for the sustenance of the offspring, and it either materially lessens in quantity, or wholly disappears, as soon as the necessity of its existence has passed away, and the little being who depended on it has acquired sufficient age and strength to exist on cruder aliment. The nursing mother, when in a state of perfect health, and properly supplied with a sufficiency, without excess, of nutritious food, elaborates this secretion in the fittest condition to ensure the health and vigour of her offspring. Her bosom is the fountain whence flows the beauty and stamina of the future adult, and whilst giving strength and life to another, she increases and prolongs her own.

The milk of woman varies with the food, health, age, &c., of the nurse. That produced from a mixed animal and vegetable diet, neither acesces nor coagulates spontaneously, like cows' milk; and when gently evaporated in an open vessel, "the last drop continues thin, sweet, and bland." Acids and rennet, however, coagulate it readily, and so does the gastric juice of the infant, as shown by the condition in which it is often ejected by the latter. The milk of a woman who lives wholly on vegetable food acesces and coagulates with equal readiness and in a precisely similar manner to cows' milk. The quality of the milk also varies with the progress of the digestion. Within the first hour or two after a meal it is thin and serous, and then gradually improves in richness and flavour, until at about the fourth or fifth hour it possesses these qualities in the highest degree. This, then, is the period at which the infant should be applied to the breast, which, according to the present habits of society, would be during the hour immediately preceding each meal, except the breakfast. After about the fifth or sixth hour the milk gradually loses its peculiar colour and odour, until towards the tenth or twelfth hour after eating food it becomes yellowish, bitter, and often nauseous; and in this condition is frequently refused by the infant. This points out the impropriety of a nurse fasting longer than 4 to 5 hours, except during the night, when the period may be extended to 7 or 8 hours, but never longer. The time after accouchement is another matter that influences the character of human milk in respect of its wholesomeness for the infant. The milk secreted soon after delivery is very thin and serous, but in the course of a few days it becomes thicker, richer, and more nutritious; and a gradual change in the same direction proceeds during the usual period of suckling. When the mother suckles her own infant, or the "age of the milk," as the nurses say, corresponds to that of the child, all goes on well; but when the former much exceeds the latter, the reverse is the case. Thus, it is found that an infant is incapable of completely digesting the milk of a nurse whose own child is much older than itself; and that an infant of a few weeks old will often starve on the milk intended by nature for one several times its age. ' It is, therefore, necessary, in selecting a wet-nurse, to be certain that her condition, in this respect, closely corresponds to that of the mother of the infant, or that it does not differ, on this point, more than 3 or 4 weeks. In respect of the use of high-flavoured or improper food and beverages, medicine, &c., it appears that all these substances immediately affect the milk, and impart to it more or less of their peculiar flavour and properties; and, except with remedies administered under medical advice, in nearly all cases prove injurious to the infant. The diet of a nurse should be nutritious and succulent, and its healthy digestion should be promoted by exercise and pure air. Strong liquors, more especially spirits, act like slow poisons on the infant, and their habitual use by a nurse should, therefore, be considered as a positive disqualification for the duties of her office. The care of the mother or wet-nurse should be particularly directed to the maintenance of her own health and equanimity, by which both the health and good temper of the infant will be, as far as possible, ensured. A grieving, irritable or angry mother, forces her bad qualities on her offspring, in the shape of fits, convulsions, or hopeless marasmus. See INFANCY, MILK, &c.

NUT'MEG. *Syn.* MYRISTICÆ NUCLEUS, NUCISTA, NUX MOSCHATA, N. MYRISTICA, N. AROMATICA, MYRISTICA (B. P., Ph. L.), L. "The shelled seed of *Myristica officinalis* (Linn.; *M. moschata*—Thunberg), or nutmeg-tree." It is chiefly used as a spice and condiment, but it is also esteemed as an aromatic in flatulency and diarrhœa.—*Dose.* Half a teaspoonful, or more, grated. The distilled and expressed oils (OLEUM MYRISTICÆ) are also officinal.

NUTRI''TION. The phenomena of life are accompanied by the constant and unceasing waste of the materials of which the animal body is composed. Every act of volition, every exertion of muscular power, every functional action of the organism, whether perceptible or imperceptible and involuntary, every play of chemical affinity and decomposition, even thought itself, occasions the disorganization and destruction, as living matter, of a portion of ourselves. But the process of respiration, and the various important changes with which it is connected, tends, more than all the other vital functions, to waste the substance of the body, the temperature of which it is its special office to support. This loss, this change, which commences with life and terminates only with death, is compensated for by the constant renewal of the whole frame by the deposition and assimilation, or organization, of matter from the blood, which thus becomes gradually thinner and impoverished, unless, in its turn, it receives a corresponding supply of its vital elements. This it does from the food, which, by the functions of digestion, is converted into 'chyle,' and, after being taken up by the 'lacteals,' passes into the blood, of which it then becomes a part, and after being animalised and rendered similar to the being it is designed to nourish, by the peculiar action of the vital affinities, it attaches itself to those organs or tissues, the loss of which it is intended to supply. This constitutes nutrition.

The food of animals, or, rather, the nutritious portion of that food on which we live, is wholly organic matter, and is either directly or indirectly produced by the powers of vegetation from the inorganic world. The plant elaborates food for the herbivora, and these, in their turn, serve as food for the flesh-eating animals. In both cases the leading alimentary principles are the same; the difference is in their proportions. Flesh is identical in composition with blood, and with the body of the animal that blood is destined to nourish. It abounds in albumen, casein, and fibrin. The vegetable substances used as food also contain nitrogenised principles of a precisely similar character and chemical constitution to those found in flesh, and which we are, therefore, bound to believe are absolutely the same. The gluten of wheat, when purified from gliadin, presents all the characteristics of pure fibrin. The albumen extracted from vegetable juices, when coagulated by heat, cannot be distinguished from the boiled white of egg in a divided condition. The legumen or vegetable casein of almonds, peas, beans, and many of the oily seeds, bears the most striking resemblance to the casein of milk. These facts clearly show that the leading nitrogenized principles of animal bodies pre-exist in vegetables, and that the substances employed as food must have the same, or nearly the same, chemical composition as the body itself. The striking contrast of animal and vegetable food, as far as this point is concerned, is more apparent than real. The actual difference between the two is to be found in the existence of a large quantity of non-nitrogenized matter (sugar, starch, &c.) in the last, which is not contained in the other—matter which abounds in carbon, and which, by its combustion in the system, serves to support the animal heat at a less sacrifice of the organic fabric. In the flesh-eating animal the waste of the organic tissues is very rapid, and the tax upon the vital energies proportionate; for the temperature of its body is kept up, for the most part, by the burning of the nitrogenised matter of which these tissues are composed.

The process of digestion is that by which the available portions of the food are reduced to a form adapted for absorption by the vessels by which it is introduced into the system. In the flesh-eating animal this process is extremely simple, and consists in the mere comminution of the food by the teeth, and its reduction to the liquid state in the stomach, after which, from the nature of its composition, it is nearly all taken up, and at once conveyed into the blood. In the herbivora, however, the process of digestion is much more complicated, and occupies a longer period. Besides the ordinary principles of flesh, their food contains starch, sugar, gum, &c., mixed with much inert vegetable fibre and other useless substances, from which it must be separated. The first of these supply materials for the waste and growth of the body, the second meet the requirements of respiration, and the last pass unaltered through the alimentary canal.

The nature of the digestive process is not clearly established. The principal objects effected appear to be the conversion of starch, coagulated albumen, fibrin, casein, &c., into a liquid form. It is known that the saliva contains a peculiar principle (ptyalin) resembling diastase, capable of transmuting starch into sugar, and that when a little starch is held in the mouth for a short time this change actually occurs. It is also known that the gastric juice contains a peculiar organic principles named 'pepsin,' and that this substance, in conjunction with dilute hydrochloric acid, which is likewise present in the stomach, possesses the property of dissolving the albuminous principles of food. (*See* Pepsin.) These changes occur whenever these conditions are established out of the body, and hence it is inferred that the process of digestion is effected by similar means. Of this, however, there is no direct evidence.

The use of food, as already noticed, is twofold. It supplies the materials of nutrition to balance the waste of the tissues continually taking place in the body, and it conveys into the system those elements which, by their chemical combinations, produce heat. To effect these purposes in the most beneficial manner, the food should not only be sufficient in quantity, but the proportions of its nitrogenised and carbonaceous principles should bear such relations to each other as to amply meet the demands of the system for each, without the existence, however, of an undue excess of either.

When the muscular movements of a healthy animal are restrained, a genial temperature kept up, and an ample supply of food containing much amylaceous or oily matter given, an accumulation of fat in the system rapidly takes place; this is well seen in the case of stall-fed cattle. On the other hand, when food is deficient, and much exercise is taken, emaciation results. These effects are ascribed to differences in the activity of the respiratory function. In the first instance, the heat-food is supplied faster than it is consumed, and hence accumulates in the form of fat; in the second, the conditions are reversed, and the creature is kept in a state of leanness by its rapid consumption. The fat of an animal appears to be the provision of nature for the maintenance of life during a certain period under circumstances of privation. Hence it is that a lean animal suffers more from cold than a fat one, and is also sooner starved.

"The origin of fat in the animal body has recently been made the subject of much animated discussion; on the one hand, it was contended that satisfactory evidence exists of the conversion of starch and saccharine substances into fat, by separation of carbon and oxygen, the change somewhat resembling that of the vinous fermentation; it was argued, on the other side, that oily or fatty matter is invariably present in the food supplied to the domestic animals, and that this fat is merely absorbed and deposited in the body in a slightly modified state. The question has now been decided in favour of the first of these views, which was enunciated by Professor Liebig, by the very chemist who formerly advocated the second opinion. By a series of very beautiful experiments, MM. Dumas and Milne-Edwards proved that bees exclusively feeding upon sugar were still capable of producing wax, which was pointrd out as a veritable fact."

Professor Liebeg has divided the principles found in food into two classes:—plastic elements of nutrition, or flesh-and-blood-making principles; and elements of respiration, or those which, by their decomposition or combustion in the system, generate heat. They are as follows:—

Elements of Nutrition. (Plastic or Nitrogenous.)	*Elements of Respiration* (Heat-producing.)
Animal flesh	Fat
Blood	Starch
Vegetable albumen	Gum
„ casein	Cane sugar
„ fibrin.	Grape „
	Milk „
	Pectin
	Alcohol.

This division is doubtless in the main warranted by fact, but, no doubt, the nitrogenous elements of food produce heat as well as the non-nitrogenous.

NUX VOMICA. *Syn.* Koochla nut, Poison n., Vomit n.; Nuces Vomicæ, Nux vomica (B. P., Ph. L. E. & D.), L. "The seed of *Strychnos Nux Vomica*, Linn." (Ph. L.), imported from the East Indies (B. P.). This drug is chiefly known as a violent excitant of the cerebro-spinal system. In small doses, frequently repeated, it is tonic, diuretic, and, occasionally, laxative; in slightly larger ones, it is emetic; and, in large doses, it is an energetic and fearful poison.—*Dose.* 1 to 3 grs.; in paralysis, nervous affections, impotence, chronic dysentery, chronic diarrhœa, &c. Its frequent use is said to render the system proof against the poison of serpents. See Strychnia, its active principle.

OAK. The British oak is the *Quercus Robur* of Linnæus, of which there are two varieties, *Q. pedunculata* and *Q. sessiflora*. The wood of the oak is more durable than that of any other tree, and "for at once supporting a weight, resisting a strain, and not splintering by a cannon shot, it is superior to every other kind." It, nevertheless, "warps and twists much in drying; and, in seasoning, shrinks about 1·32nd of its width." Foreign oak is less durable, but more brittle and workable. The bark (OAK BARK; QUERCÛS CORTEX. QUERCUS—B. P., Ph. L. E. & D.) is used as an astringent and febrifuge, in doses of 30 to 120 gr., frequently; an astringent decoction is also made of it, but its chief employment is in tanning leather. The peculiar appearance of old oak or 'wainscoting' is given to the new wood by exposing it, whilst very slightly damp, to the fumes of ammonia.

OAT. *Syn.* AVENA, L. The common cultivated oat is the Avena sativa (Linn.), a graminaceous plant, of which there are several varieties, as the Avena sativa alba, or white oat; A. s. nigra, or black oat; the potato oat, &c. Other species are also cultivated, as Avena nuda (Linn.), pilcorn, or naked oat; A. strigosa, or Spanish oat, &c. The seed (OATS; CARYOPSIDES, SEMINA AVENÆ CRUDA) form the common horse-corn of this country, but in the northern parts of the country it is extensively used as food for man. The husked grain constitutes GROATS, and its meal OATMEAL. The latter does not form a dough with water, as wheaten meal or flour does.

Oats consist of from 24% to 28% of husk, and 74% to 78% of grain. According to M. Payen, they contain of starch 60·59%; azotized matter, 14·39%; saccharine and gummy matter, 9·25%; fatty matter, 5·50%; cellulose, 7·60%; silica and saline matter, 3·25%. The husk contains between 6 and 7% of saline matter. (Prof. Norton.) The ash is 2·18%, and consists of potassa and soda, 26·18%; lime, 5·95%; magnesia, 9·95%; oxide of iron, ·40%; phosphoric acid, 43·84%; sulphuric acid, 10·45%; chlorine, ·26%; silica, 2·67%; alumina, ·06%. (Johnston.)

The yield of oats is from 20 bushels per acre in poor soils, up to 60, 70, and even 80 bushels per acre in rich soils. The weight per bushel varies from 35 to 45 lb., and the product in meal is about one half the weight of the oats.

A large proportion of the oats given to horses passes off undigested. It has hence been proposed to prevent this loss, by either coarsely bruising them in a mill, or by pouring boiling water over them, and allowing them to macerate till cold, when they are to be given to the horses without straining off the water. It is stated on good authority, that oats thus treated will not only fatten quicker, but go twice as far as without preparation. Oat bruisers are now manufactured by most agricultural implement makers.

OAT'MEAL. *Syn.* AVENÆ FARINA, F. EX SEMINIBUS AVENÆ (Ph. D.), L. Of thirty samples of oatmeal examined by the 'Lancet Sanitary Commissioner,' no fewer than sixteen samples, or more than one half, were adulterated. The substance generally used for this purpose is barley meal, which is only half the price of oatmeal. That supplied to the army, navy, the workhouses, &c., is also very commonly adulterated with whiting, plaster of Paris, or ground bones. These frauds are readily detected by the microscope.

OBE''SITY. *Syn.* OBESITAS, POLYSARCIA, L. Unhealthy or troublesome fatness or corpulency. Sometimes the secretion of fat, and its accumulation in the adipose membrane, is almost as rapid as that of water in anasarca; on which account some of the old writers have called obesity a dropsy of fat. Persons in easy circumstances, of indolent habits, who live freely, and who are of a cheerful and contented disposition, are those most liable to obesity. The treatment consists in the very gradual reduction of the diet, until it falls rather below the average quantity required by a healthy adult; the very gradual disuse of fermented liquors, more especially beer; the gradual abridgment of the time devoted to repose, until it does not exceed 5 or 6 hours; the employment of several hours daily in exercise in the open air, at first moderate, but increased day by day in energy, until it becomes laborious; and, lastly, arousing the mind from a state of lethargy to one of active or even harassing employment.

In some few cases the accumulation of fat has been enormous. Bright, of Maldon, weighed 728 lb.; Daniel Lambert, of Leicester, 739 lb.; a girl, 4 years old, noticed in the 'Phil. Trans.,' 1813, weighed 256 lb.

Persons affected with obesity are generally short-lived.

O'CHRES. These are native earthy compounds of clay, coloured with oxide of iron, with frequently a little chalk, or magnesia. The differences in the colour arise partly from the quantity of iron present, and partly from the state of oxidation in which the iron is found. Several varieties are known in commerce—BROWN OCHRE, FRENCH O., OXFORD O., RED O., ROMAN O., YELLOW O. All these with the exception of the first and fourth, have a yellow colour. ARMENIAN BOLE, INDIAN RED, VENETIAN R., and SPANISH BROWN, are also ochres.

All the ochres are darkened by calcination. The yellow ochres acquire a red or reddish-brown colour by this treatment. The pigment called 'light red' is thus prepared from yellow ochre.

ODONTAL'GIA. See TOOTHACHE.

O'DORAMENTS. *Syn.* ODORAMENTA, L. Substances employed in medicine on account of their odour. They differ from disinfectants, in only disguising, but not destroying, noxious vapours, &c. AMMONIA, STRONG VINEGAR, and PASTILLES, furnish the most familiar examples of this class of substances. See DISINFECTANTS, PERFUMES, &c.

O'DOUR. The emanation of an odoriferous or scent-giving body. See PERFUMES.

ŒNAN'THIC ETHER. See Ether (Œnanthic).

OFFIC'INAL. *Syn.* Officinalis, L. A term applied to substances or medicines ordered in the Pharmacopœia.

OIL. *Syn.* Oleum, L.; Huile, Fr. This name is given to numerous liquid or semi-liquid substances, expressed or drawn from animal or vegetable bodies; to various products of the distillation of bituminous minerals; and to several unctuous mixtures in perfumery and pharmacy. To facilitate reference, we have grouped the principal substances generally called 'oils' into classes, under the following heads:—Oils (Drying); Oils (Empyreumatic); Oils (Fixed); Oils (Medicated); Oils (Mineral); Oils (Mixed); Oils (Perfumed); Oils (Volatile). See these articles, also *below*:—

Oil, Consol'idated. *Syn.* Campticon, Factitious caoutchouc. A substance having most of the properties of India rubber, prepared by oxidising boiled linseed oil, or any other oil that hardens on exposure to the atmosphere. To obtain the solid oil, plates of glass are dipped into linseed oil, the films are then allowed to dry, and the process is repeated again and again until the plates are coated with many layers of perfectly oxidised oil. Instead of plates of glass, extensive surfaces of prepared cloth are employed when the manufacture is carried out on a large scale. The solid oil, having been scraped or peeled off the surfaces, is worked with a small proportion of shell-lac, by means of a mixing machine with hot rollers, until a material singularly like caoutchouc is produced. The consolidated oil can be rolled on to fabrics, so as to form a waterproof cloth, having the finish and flexibility of rubber-cloth. By the action of heat the consolidated oil may be converted into a hard substance, resembling vulcanite and ebonite. Its useful applications appear to be very numerous, but its manufacture has not as yet made much progress.

OIL-GAS. A mixture of several gaseous hydrocarbons, obtained by passing common whale or other cheap animal oil through red-hot tubes, or by allowing it to fall in drops on red-hot stones or bricks arranged in an iron retort, or other suitable apparatus. The gas has great illuminating power, requires no purification, and is quite free from the ammoniacal and sulphur compounds which vitiate coal-gas. The high price of oil prevents the general use of this gas for illuminating purposes.

OILS (Drying). All the fixed oils have an attraction more or less powerful for oxygen, and, by exposure to the air, they either become hard and resinous, or they only thicken slightly, and become sour and rancid. Those which exhibit the first property in a marked degree, as the oils of linseed, poppy, rape, and walnut, are called 'drying oils,' and are used as vehicles for colours in painting. The others are frequently termed 'glutinous' or 'non-drying oils.'

The resinifying or drying property of oils is greatly increased by boiling them, either alone or along with some litharge, sugar of lead, or white vitriol, when the product forms the 'boiled oil' or 'drying oil' (oleum desiccativum) of commerce. The efficacy of the process, according to Liebig, depends on the elimination of substances which impede the oxidation of the oil. The following formulæ are adopted for this purpose:—

1. Linseed oil, 1 gall.; powdered litharge, ¾ lb.; simmer, with frequent stirring, until a pellicle begins to form; remove the scum, and when it has become cold and has settled decant the clear portion. Dark coloured; used by house-painters.

2. Linseed oil and water, of each, 1 quart; white vitriol, in powder, 2 oz.; boil to dryness. Paler than the last.

3. Pale linseed or nut oil, 1 pint; litharge or dry sulphate of lead, in fine powder, 2 oz.; mix, agitate frequently for 10 days, then set the bottle in the sun or a warm place to settle, and decant the clear portion. Very pale.

4. Linseed oil, 100 galls.; calcined white vitriol ('sulphate of zinc'), in fine powder, 7 lbs.; mix in a clean copper boiler, heat the whole to 285° Fahr., and keep it at that temperature, with constant stirring, for at least one hour; then allow it to cool, in 24 hours decant the clear portion, and in 3 or 4 weeks more rack it for use. *Used* for varnishes.

5. (Liebig.) Sugar of lead, 1 lb., is dissolved in rain water, ½ gall.; litharge, in fine powder, 1 lb., is then added, and the mixture is gently simmered until only a whitish sediment remains; levigated litharge, 1 lb., is next diffused through linseed oil, 2½ galls., and the mixture is gradually added to the lead solution, previously diluted with an equal bulk of water; the whole is now stirred together for some hours, with heat, and is, lastly, left to clear itself by exposure in a warm place. The lead solution which subsides from the oil may be used again for the same purpose, by dissolving in it another lb. of litharge, as before.

6. (Wilks). Into linseed oil, 236 galls., pour oil of vitriol, 6 or 7 lbs., and stir the two together for 3 hours; then add a mixture of fuller's earth, 6 lbs., and hot lime, 14 lbs., and again stir for 3 hours; next put the whole into a copper, with an equal quantity of water, and boil for about 3 hours; lastly, withdraw the fire, and when the whole is cold, draw off the water, run the oil into any suitable vessel, and let it stand for a few weeks before using it. *Patent.*

7. ('Allg. Polytech. Zeitung.') Binoxide of manganese (in coarse powder, but not dusty), 1 part; nut or linseed oil, 10 parts; mix, and keep the whole gently heated and frequently stirred for 24 to 36 hours, or until the oil begins to turn reddish. Recommended for zinc paint, but is equally adapted for other purposes for which boiled oil is employed.

Obs. There is often a difficulty in obtaining the oils 'bright' after boiling or heating them with the lead solutions; the best way, on the small scale, is either to filter them through coarse woollen filtering paper, or to expose the bottle for some time to the sun or in a warm place. On the large scale, the finer oils of this kind are often filtered through Canton-flannel bags. The litharge and sulphate of lead used in the above processes may be again rendered available for the same purpose, by washing them in hot water, to remove adhering mucilage.

OILS (Empyreumat'ic). *Syn.* OLEA EMPYREUMATICA, L. The 'empyreumatic oils' of the old pharmaceutical writers were oily fluids obtained by the dry distillation of various substances, animal, vegetable, and mineral. But few of them are in use at the present day, though formulæ are given for them in some of the foreign pharmacopœias. Two or three have useful applications in the arts, and it is therefore necessary that we should briefly describe their preparation. When the ingredients are of a liquid or pasty nature, or become so when heated, they are usually mixed with about twice their weight of sand, powdered glass, or other like substance, to divide them, and thus expose them more effectually to the action of the fire. Care must also be taken to provide a well-cooled receiver, which must be furnished with a tube to carry off the non-condensable gases liberated at the same time as the oil. The products of the first distillation are generally purified by rectification, either alone or along with water. In general, they require to be preserved from the light and air.

The following are the principal substances belonging to this class:—

Oil of Al'oes. *Syn.* ALOETIC OIL; OLEUM ALOETICUM, L. 1. From Socotrine or hepatic aloes distilled along with sand.

2. (Batavian—Cadet de Gassicourt.) Olive oil, 1 lb.; hepatic aloes and myrrh, of each, in powder, 2 oz.; olibanum, ½ oz.; distil in a sand bath, from a stoneware retort. *Used* as an external vermifuge for children; a portion is rubbed 2 or 3 times a day over the umbilical regions.

Oil of Am'ber. *Syn.* OLEUM SUCCINI, L. From coarse pieces of amber, distilled in an iron retort, either alone or reduced to powder and mixed with sand. The oil is separated from the fetid liquor and succinic acid which passes over, and rectified along with about 6 times its volume of water, by a gentle heat. It then forms 'RECTIFIED OIL OF AMBER' (OLEUM SUCCINI—Ph. L. 1836, O. S. RECTIFICATUM—Ph. D. 1826, O. S. PURISSIMUM—Ph. E. 1841). *Prod.* 20%.

Prop., &c. It has a pale yellow colour, a strong, ungrateful odour, and a hot, acrid taste; heat and air blacken and thicken it; it boils at 186° Fahr. Sp. gr. ·758 at 75° Fahr. It is antispasmodic, rubefacient, and stimulant.—*Dose.* 5 to 12 drops, made into an emulsion with mucilage; in hysteria, epilepsy, and convulsive affections. Externally, as a friction, either alone or combined with laudanum or sweet oil, in rheumatism, tic douloureux, hooping-cough, &c. See MUSK (Factitious).

Oil, An'imal. 1. (Empyreumatic or Fetid; OIL OF HARTSHORN, DIPPEL'S O.; OLEUM ANIMALE EMPYREUMATICUM, O. CORNU CERVI, O. DIPPELII, L.) Chiefly obtained as a secondary product in the manufacture of bone-black. Fetid and dark coloured. *Used* chiefly to make lampblack.

2. (Ethereal; RECTIFIED OIL OF HARTSHORN; OLEUM ANIMALE ÆTHERIUM, O. CORNU CERVI RECTIFICATUM, LOCO OLEI ANIMALIS DIPPELII, L.)—*a.* A finer kind of animal oil, made by slowly distilling oil of hartshorn, and collecting only the first portion that comes over. Pale and limpid. Exposure to light discolours it.

b. (Ph. Bor.) Fetid animal oil distilled in a sand bath, and the product rectified with four times its volume of water. White, limpid, fragrant. Light discolours it.

Prop. The refined product is said to be antispasmodic, anodyne, and diaphoretic.—*Dose.* 5 to 30 drops, in water; in large doses, it acts as an irritant poison.

Oil of Birch. *Syn.* OLEUM BETULÆ, L. From the inner bark of the birch, by heating it in an earthen pot with a hole in the bottom, to allow the oil to flow through into another jar sunk in the ground and luted to it. Thick, balsamic, fragrant. *Used* chiefly to dress Russia leather.

Oil of Box-wood. *Syn.* OLEUM BUXI, O. B. EMPYREUMATICUM (Ph. L. 1746), L. From box-wood sawdust. Reputed resolvent; anodyne, antispasmodic, and diaphoretic.—*Dose.* 5 to 20 drops; in convulsions, epilepsy, gonorrhœa, &c. Externally, in toothache, &c.

Oil of Bricks. *Syn.* OLEUM LATERITIUM (Ph. L. 1746), L. From olive oil, mixed with brickdust, and distilled; or, from hot bricks steeped in olive oil, then broken to pieces, and distilled.

Oil of Bricks (Factitious). *Syn.* OLEUM LATERITIUM FACTITIUM, L. From linseed oil, 1 lb.; oil of turpentine, ½ lb.; oil of bones or of hartshorn and Barbadoes tar, of each, 1 oz.; simply stirred well together. This is generally substituted for the preceding in the shops.

Oil of Cade. *Syn.* OLEUM CADINUM, L.; HUILE DE CADE, Fr. From the *Juniperus oxycedrus* or Languedoc juniper. *Used* as oil of tar, which is commonly sold for it.

Oil of Coal. *Syn.* COAL OIL. From the gas-works. See NAPHTHA.

Oil of Gua'iacum. *Syn.* OLEUM GUAIACI, O. G. EMPYREUMATICUM, L. From guaiacum shavings or raspings. Reputed balsamic, pectoral, and resolvent.

Oil of Harts'horn. Bone oil and rectified bone oil are commonly sold for it, but are inferior to it. See ANIMAL OIL (*above*).

Oil, Paper. *Syn.* RAG OIL, PYROTHONIDE;

OLEUM CHARTÆ, L. On the small scale, by burning paper on a cold tin plate, and collecting the oil; on the large scale, by the destructive distillation of paper or linen rags. In baldness, toothache, ear-ache, &c.

Oil, Par'affin. See MINERAL OILS.

Oil, Petro''leum. See MINERAL OILS, PETROLEUM.

Oil, Rag. See PAPER OIL (*above*).

Oil, Rock. See NAPHTHA, MINERAL OILS, PETROLEUM.

Oil, Shale. See MINERAL OILS.

Oil of Soot. *Syn.* OLEUM FULIGINIS (Ph. L. 1746), L. From wood-soot. Fetid; reputed antispasmodic and nervine.

Oil of Tar. *Syn.* SPIRIT OF T.; OLEUM PINI, O. P. RUBRUM, O. TÆDÆ, O. PICIS LIQUIDÆ, L. By simple distillation from wood-tar. Reddish and strong scented. By one or more rectifications it becomes colourless and limpid. It soon gets thick. *Used* in ringworm and several other skin diseases, made into an ointment with lard. It is poisonous if swallowed in large doses.

Oil of Tobac'co (Empyreumatic). *Syn.* OLEUM TABACI EMPYREUMATICUM (Ph. U. S.), L. From tobacco, in coarse powder, gradually heated in a green-glass retort to dull redness, and kept at that temperature as long as any oil passes over; the oily portion is then separated from the water in the receiver, and kept for use. Highly narcotic and poisonous.

Oil of Wax. *Syn.* OLEUM CERÆ, L. From bees' wax and sand distilled together; the product is rectified once or oftener. Reputed diuretic.—*Dose.* 3 to 6 drops.

OILS (Fixed). *Syn.* FAT OILS, UNCTUOUS O.; OLEA FIXA, O. EXPRESSA, L.; HUILES GRASSES, Fr. The fixed oils are compounds of carbon, hydrogen, and oxygen (oxyhydro-carbons), obtained from the organic kingdom, and characterised by their insipidity, unctuosity, insolubility in water, and being lighter than that fluid. Olive oil, which is obtained from the vegetable kingdom, and spermaceti oil, which is obtained from the animal kingdom, may be taken as types of the rest.

The fixed oils are chiefly found in the fruit and seeds of plants, and in thin membranous cells, forming what is called the adipose tissue, in the bodies of animals. According to their consistence, they may be classed into 'OILS,' 'BUTTERS,' and 'TALLOWS.'

Prop., &c. Among the best-known properties of the fixed oils are—the permanent stain they give to paper, which they render translucid; their non-volatility at the ordinary temperature of the atmosphere, or at that of boiling water, or, indeed, at any temperature insufficient for their decomposition; their constantly floating on the surface of water when added to it; and, lastly, their inability to mix with that fluid. Some of them, as palm oil and cocoa-nut oil, are solid at ordinary temperatures; but the majority are fluid, unless they have been considerably cooled, when they separate into two portions—the one solid, consisting chiefly of stearin, or some analogous substance, and the other liquid, consisting chiefly of olein or elain. Nearly all of them, when exposed to the air, absorb oxygen rapidly, and either gradually harden or become rancid and nauseous. From the first are selected the 'drying oils' used by painters; the last are used as food, in cookery, and for machinery, lamps, &c. The whole of these oils, when heated to their boiling-points (500° to 600° Fahr.), suffer decomposition, yielding various hydrocarbons; and when suddenly exposed to a red heat, they furnish a gaseous product (oil-gas), which was formerly employed for illumination. It is owing to this property of oil and liquid fats that candles and lamps give their light. The wick is a gas-producing apparatus in miniature. With the caustic alkalies and water, the fixed oils unite to form soap. When some of these oils are absorbed by porous bodies, and thus expose a vastly increased surface to the air, they absorb oxygen with such rapidity as to generate a considerable degree of heat. Paper, tow, cotton, wool, straw, shavings, &c., slightly embued with oil, and left in a heap, freely exposed to the air or sun, often spontaneously inflame. In this way many extensive fires have arisen. The above is more particularly the case with linseed, rape, nut, and olive oil. The first, made into a paste with manganese, rapidly becomes hot, and ultimately inflames spontaneously.

The specific gravities of the fixed oils range between ·865 and ·970, water being 1·000.

Prep. The fixed oils, except where otherwise directed, are obtained from the bruised or ground fruit or seed, by means of powerful pressure, in screw or hydraulic presses, and are then either allowed to clarify themselves by subsidence or are filtered. Both methods are frequently applied to the same oil. In some cases the impurities are removed by ebullition with water, and subsequent separation of the pure oil. Heat is frequently employed to increase the liquidity of the oil, and thus lessen the difficulty of its expulsion from the mass. With this object the bruised mass, placed in bags, is commonly exposed to the heat of steam, and then pressed between heated plates of metal. This is always necessary with the 'butyraceous oils.'

Another method is by boiling the bruised seed in water, and skimming off the oil as it rises to the surface. This is the plan adopted for castor oil in the West Indies.

In a few cases, for medicinal purposes, the bruised mass is mixed with ½ its weight, or an equal weight, of alcohol or ether, and after 24 hours' digestion the whole is submitted to pressure, and the alcohol or ether removed by distillation at a gentle heat. The first menstruum is commonly employed for croton oil on the Continent; the second, for that of ergot of rye.

Purif. Several methods are adopted for refining or purifying the fixed oils, among which are the following:—

1. The oil is violently agitated along with 1½ to 2% of concentrated sulphuric acid; when it assumes a greenish colour, and, after about a fortnight's repose, deposits much colouring matter, becomes paler, and burns with greater brilliancy, particularly if well washed with steam or hot water, and clarified by subsequent repose or by filtration. This answers well for most of the recently expressed vegetable oils. It also greatly improves most of the fish oils.

2. A modification of the last method is to well mix the acid with the oil, then to blow steam through the mixture for some time, and afterwards to otherwise proceed as before.

3. FISH OIL (WHALE, SEAL, &c.) is purified by—

a. Violently agitating it with boiling water or steam, by placing it in a deep vessel with a perforated bottom, through which high pressure steam is forced for some time; it is afterwards clarified by repose, and filtered through coarse charcoal.

b. The oil is violently agitated with a boiling-hot and strong solution of oak bark, to remove albumen and gelatine, and next with high-pressure steam and hot water; it is, lastly, dried and filtered.

c. The oil, gently heated, is stirred for some time with about 1% of good chloride of lime, previously made into a milk by trituration with water; about 1½% of oil of vitriol, diluted with 20 times its weight of water, is then added, and the agitation renewed and maintained for at least 2 hours; it is, lastly, well washed with steam or hot water.

d. Mr. Davidson treats the oil, first with a strong solution of tan, next with water and chloride of lime, then with dilute sulphuric acid, and, lastly, with hot water.

e. Mr. Dunn's method, which is very effective, and admirable on account of its simplicity, is to heat the oil by steam to from 180° to 200° Fahr., and then to force a current of air of corresponding temperature through it, under a flue or chimney, until it is sufficiently bleached and deodorised; it is, lastly, either at once filtered or is previously washed with steam or hot water.

f. Another method, formerly very generally adopted and still in use, is to violently agitate the oil for some time with very strong brine, or with a mixed solution of blue vitriol and common salt, and then either to allow it to clarify by repose or to filter it through freshly burnt charcoal.

4. ALMOND, CASTOR, LINSEED, NUT, OLIVE, RAPE, and some other vegetable oils, are readily bleached by either of the following processes:—

a. Exposure in glass bottles to the sun's rays, on the leads or roofs of houses, or in any other suitable position, open to the south-east and south. This is the method employed by druggists and oilmen to whiten their castor and linseed oils. 14 to 21 days' exposure to the sun in clear weather during summer is usually sufficient for castor oil when contained in 2 to 4-quart pale green glass bottles (preferably the former), and covered with white gallipots inverted over them. The oil is filtered before exposing it to the light, as, if only in a slight degree opaque, it does not bleach well. Almond and olive oil are, when thus treated, apt to acquire a slight sulphurous smell; but this may be removed by filtration through a little animal charcoal, or, still better, by washing the oil with hot water.

b. Another method employed to decolour these oils is to heat them in a wooden, tinned, or well-glazed earthen vessel along with some dry 'filtering powder' (1 to 2 lbs. per gal.), with agitation for some time, and, lastly, to filter them in the usual manner through an oil-bag. In this way the West-end perfumers prepare their 'WHITE ALMOND OIL' (OLEUM AMYGDALÆ ALBUM), and their 'WHITE OLIVE OIL' (OLEUM OLIVÆ ALBUM). Formerly, freshly burnt animal charcoal was used for this purpose, and is still so employed by some houses.

5. Mr. Bancroft refines OILS FOR MACHINERY AND LUBRICATING PURPOSES generally, by agitating them with a lye of caustic soda of the sp. gr. 1·2. A sufficient quantity is known to have been added when, after repose, a portion begins to settle down clear at the bottom. About 4% to 8% is commonly required for lard oil and olive oil. After 24 hours' repose, the clear supernatant oil is decanted from the soapy sediment, and filtered.

6. Not only the oils above referred to, but all other oils and fats may be rendered perfectly colourless by the use of a little chromic acid; or, what is the same, by a mixture of a solution of bichromate of potassa and sufficient sulphuric, hydrochloric, or nitric acid, to seize on all the alkali, and thus liberate the chromic acid.

7. PALM OIL and COCOA-NUT OIL are generally refined and bleached by either chromic acid or chlorine, or by heat:—

a. The 'butyraceous oil' is liquefied by heat in a wooden vessel, and 7% to 9% of good chloride of lime, previously made into a smooth cream with water, is added, and the whole assiduously stirred until the ingredients appear united; the mixture is then allowed to cool, and is next cut up into small lumps, which are exposed to a free current of air for 2, 3, or even 4 weeks; these are melted in a wooden vessel heated by high-pressure steam circulating through leaden pipes, or in a cast-iron boiler lined with lead, and an equal weight of oil of vitriol (diluted with about 20 times its weight of water) is poured in, and the whole gently boiled until the oil is decoloured and runs clear; the fire is then moderated, and the whole allowed to settle; lastly, the fire is removed, and the oil is left to cool very slowly.

b. The process with chromic acid has been already noticed, but is more fully explained *below.*

c. The oil, heated to the temperature of about 250° Fahr., is exposed to the action of high-pressure steam, which is continuously 'blown' through it for 10 or 12 hours, or even longer. The process is greatly facilitated by the introduction of some chromic acid.

8. Mr. Watt's methods of purifying fats and oils are very effective, more especially for those intended for illumination. They are as follows:—

a. (For FISH OILS.) Each ton is boiled for ½ an hour with caustic soda, ½ lb., previously made into a weak lye with water; or steam is blown through the mixture for a like period; oil of vitriol, ½ lb., diluted with 6 times its weight of water, is next added, the whole again boiled for 15 minutes, and allowed to settle for an hour or longer, when the clear oil is run off from the water and sediment into the bleaching tubs; here solution of bichromate of potash, 4 lbs., in oil of vitriol, 2 lbs., previously diluted with water, q. s., together with a little nitric acid and some oxalic acid, are added, and after thorough admixture of the whole, by blowing steam through it, strong nitric acid, 1 lb., diluted with water, 1 quart, is poured in, and the boiling continued for ½ an hour longer; a small quantity of naphtha or rectified spirit of turpentine is then mixed in, and the oil is, finally, well washed with hot water, and left to settle.

b. (For PALM OIL.) The oil is melted by the heat of steam, and, after it has settled and cooled down to about 130° Fahr., is carefully decanted from the water and sediment into the steaming tubs; here a mixture of a saturated solution of bichromate of potash, 25 lbs., and oil of vitriol, 8 or 9 lbs., is added, and after thorough admixture, hydrochloric acid, 50 lbs., is poured in; the whole is then constantly stirred until it acquires a uniform greenish colour, or is sufficiently decoloured, a little more of the bleaching materials being added if the latter is not the case, after which it is allowed to repose for half an hour to settle; it is next run into a wooden vat, where it is washed, &c., as before.

c. (For VEGETABLE OILS.) These are treated with a solution of chromic acid, or with a solution of bichromate of potassa, or some mineral acid, as noticed at (6). For COLZA, LINSEED, MUSTARD, NUT, and RAPE OIL, a little hydrochloric acid is added; but for ALMOND, CASTOR, OLIVE OIL, and POPPY OIL, no such addition (at least in excess) is required.

9. **RANCID OILS and FATS** are recovered by boiling them for about 15 minutes with a little water and calcined magnesia; or, by filtering them through freshly burnt charcoal.

In reference to the above processes, it may be useful to remark, that chlorine, the common bleacher and deodoriser of other substances, cannot be well employed directly in the purification of oils, as certain chemical reactions occur when these substances are brought together, which increase the colour instead of removing it, and are often otherwise injurious. The same remarks apply to the use of the 'chlorides,' which frequently fails in unskilful hands, and is, indeed, of questionable utility, except, perhaps, in the case of palm oil. Even charcoal exerts little of its usual energy on the oils, and whilst it removes or lessens their offensive odour, sometimes increases their colour. The addition of 1% or 2% of very pure and recently rectified naphtha or oil of turpentine (camphine) to lamp oil is a real improvement, since it increases its combustibility and its illuminative power.

OILS FOR MEDICAL PURPOSES, as CASTOR OIL, COD-LIVER OIL, &c., must not be subjected to any process beyond mere clarification by subsidence, filtration through Canton flannel or porous paper, or, at the utmost, washing with warm water, as otherwise their active and valuable properties, if not wholly removed, will be considerably lessened. See FILTRATION.

Purity. The fixed oils vary greatly in their value, and hence the constant inducement which leads the unprincipled dealer to adulterate the more expensive ones with those of a similar character, but of an inferior kind of grade. Various methods are adopted to detect these frauds, among which the following are the most valuable of those capable of general application. Others referring to individual oils will be found under the respective heads.

1. (From the odour.) The method of applying this test is to heat a few drops of the oil under examination in a small porcelain, platinum, or silver spoon or capsule (a watch-glass answers well), and to carefully compare the odour evolved with that arising from a known pure sample of the same kind and quality of the oil similarly treated. The odour of the two, when each is pure, is precisely alike, and immediately suggests the plant or animal from which it has been obtained. The presence of LINSEED, NUT, RAPE, SEAL, TRAIN, or WHALE OIL, is thus readily detected, and the imperfections of the sample, even if pure, rendered much more perceptible.

2. (From the density.)—*a.* According to M. Penot, every oil supposed to come from the same plant, or the same animal, has its own particular density, which, at the same temperature, never deviates more than a few thousandths. To apply this test, the relative density or specific gravity of the sample must be determined. This may be done by means of a thousand-grain bottle or an ordinary 'areo-

METER;' or, more conveniently, by an 'ELAÏOMETER' or 'OLEOMETER,' constructed and graduated for the purpose. 'Fischer's ELAÏOMETER' or 'OIL-BALANCE' is much employed on the Continent for this purpose, and is a very useful instrument. On the large scale, the weight of an accurately measured imperial gallon of the oil may be taken.

b. M. Laurot, an eminent Parisian chemist, a short time since observed that the variations of the density of an oil from adulteration are rendered much more apparent when it is examined in a heated state. To render this discovery practically available, he plunges an 'elaïometer,' graduated for the given temperature, into a small tin cylinder nearly filled with the oil, and then places this in a vessel containing boiling water; as soon as the whole has acquired a uniform temperature, he observes the point on the scale of the instrument at which it floats. This point for—

Colza oil is	0°
Fish oil	83°
Poppy oil	124°
Hemp-seed oil	136°
Linseed oil	210°

c. By employing a specific gravity bottle or small glass globe, fitted with a stopper in which is hermetically fixed a capillary tube of about 8 or 9 inches in length, we may apply the above principle of M. Lauret with the greatest accuracy. This little apparatus is filled with the oil, and then immersed in boiling water for a sufficient length of time for it to acquire that temperature; it is then removed and weighed. The smallest adulteration is in this way immediately detected.

When the density of the given sample has been taken, and the name of the oil used to adulterate it is known, the quantity of the latter present may be approximately determined from the specific gravities by the common method of alligation.[1]

3. (Sulphuric-acid test.)—*a.* Heidenreich was the first person who gave a useful and general application to the reactions which occur when oil of vitriol is mixed with the fatty oils. As soon as these substances are placed together, very intense chemical action commences, the temperature of the mixture rises, and the mass becomes coloured. These changes are sufficiently varied in the case of the different oils to furnish us with the means of identifying many of them, and of determining their purity. The method of M. Heidenreich is to lay a plate of white glass over a sheet of white paper; on the glass he places 10 or 15 drops of oil, and then adds to it a small drop of concentrated sulphuric acid ('oil of vitriol'). The appearances which follow differ with the character of the fatty oil examined, and whether the acid is allowed to act on the oil undisturbed (without stirring) or the two are stirred together with a glass rod. In many cases, as with tallow oil, a peculiar odour as well as a change of colour is developed, and a further means of detection supplied. M. Heidenreich has minutely described these reactions, which, for the most part, closely resemble those given in the table, page 808. It is necessary, however, in order to ensure great accuracy, to compare the effects of the reagent on the sample with those which it produces on pure oil of the same kind and character under precisely similar circumstances.

b. M. Penot, who has followed up the researches of M. Heidenreich with considerable success, recommends the employment of 20 drops of oil, instead of only 10 or 15; and the use of a small capsule of white porcelain, instead of a plate of glass. He also employs a saturated solution of bichromate of potash in sulphuric acid, which he uses in the same proportion as before; but in this case the oil and the reagent are always stirred together.

The observations of M. Penot have been repeated in many cases by Mr. Cooley, and the results, with additions, and rearranged, are given in the table, p. 808.

"By perusing this table," writes M. Penot, "it will be observed that the same oil does not, under all circumstances, yield precisely similar results with the same reagent. This depends on the place of growth, the age, and the manner of pressing. If, however, any oil be examined comparatively with a perfectly pure one, the proof of adulteration may be rendered, if not certain, at least probable, by noting the difference. Thus I obtained, by adding 1 part of either whale-train, or linseed oil, or oleic acid, or 10 parts of rapeseed oil, the following results:—

NAME OF OIL.	REAGENTS.		
	Sulphuric Acid.		Solution of Bichromate of Potash.
	Not stirred.	*Stirred.*	*Stirred.*
Rape oil with whale-train oil	More red ground than with rape oil	Brownish-olive coloured	Small reddish lumps on a gray ground.
Rape oil with linseed oil	No perceptible difference from the rape oil	Olive coloured	Small and more numerous red lumps on a very dark-green ground.
Rape oil with olein or oleic acid	No perceptible difference from the rape oil	Greenish brown.	Small brownish lumps on an olive-coloured ground.

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[1] See MIXTURES, Arithmetic of.

"The adulteration being ascertained as far as is possible, the oil is then tested by endeavouring to discover the adulterating oil, either by reagents or by its odour when gently heated, as before described. This having been found out, small quantities of the suspected oil are added to a perfectly pure oil of the kind under examination. Every mixture is then tested by the reagents, until precisely similar results are obtained as those yielded by the oil under examination. Thus, the proportions of the two mixed oils will be discovered by approximation." (M. Penot.) A simpler method of finding the proportions of the so mixed oils is referred to above.

4. (From increase of temperature.) M. Maumené proposed the increase of temperature arising from the admixture of monohydrated sulphuric acid (oil of vitriol, sp. gr. 1·845) with the fatty oils as a test of their purity, but a sufficient number of observations have not yet been made to furnish data for a general application of this method. According to MM. Faisst and Knauss, who have re-examined the subject, the following are the results when 15 grammes of oil are mixed with 5 grammes of the acid:—

	Rise of Temperature.
Almond oil	72·5°
Olive "	68·0°
Poppy "	127·0°
Rape or colza oil	100·0°
Linseed oil (*with Nordhausen* or *fuming acid only*)	133·0°

The above method is less liable to error when a larger quantity of the substances are thrown together.

5. The presence of FISH OIL in the vegetable oils may be readily detected by passing a stream of chlorine through them; the pure vegetable oils are not materially altered, but a mixture of the two turns dark brown or black.

⁂ The following are the principal fixed oils met with in commerce, or which are objects of interest or utility:—

Oil of Al'monds. *Syn.* OLEUM AMYGDALÆ (B. P., Ph. L.), O. AMYGDALARUM (Ph. D.), O. AMYGDALI COMMUNIS (Ph. E.), L. "The oil expressed from the kernels." (Ph. L.) "Bruise the fresh almonds in a stone mortar, then put them into a hempen sack, and express the oil, without heat." (Ph. E.) The oil of almonds B. P. and of commerce is obtained from either the bitter or sweet almond, but chiefly from the first, on account of their less value, and the marc being employed in the manufacture of essential oil.

Prop., &c. Oil of almonds is black, demulcent, emollient, and nutritious; possesses a purely oleaginous taste, and is one of the most agreeable of the fixed oils; when taken in quantity, it is mildly laxative; it is little affected by cold, and congeals with difficulty; is soluble in 25 parts of cold and 6 parts of boiling alcohol; ether dissolves it freely. Sp. gr. ·915 to ·918. *Av. prod.* Sweet almonds, 46⁰⁄₀; bitter a., 41⁰⁄₀.

Pur. It is extensively adulterated with poppy, nut, and teel oil, and not unfrequently with refined rape or colza oil. (See *above.*)

Oil of Bay. 1. (EXPRESSED O. OF B.; OLEUM LAURI, O. LAURINUM, L.) By expression from either fresh or dried bayberries, as castor oil. Limpid; insipid.

2. (By decoction; BUTTER OF B.; OLEUM LAURI NOBILIS, O. L. VERUM, L.) From the berries, by boiling them in water, and skimming off the oil. Green, buttery; chiefly imported from Italy. *Used* by the vulgar in bruises, sprains, rheumatism, deafness, &c. *Prod.* 20⁰⁄₀.

Oil of Beech. *Syn.* OLEUM FAGI, L. From the nuts of *Fagus sylvatica* (Linn.) or beech mast. Clear; keeps well; when washed with hot water, it is used for salads, and burnt in lamps. Sp. gr. ·9225. *Prod.* 16⁰⁄₀.

Oil of Belladon'na. *Syn.* OLEUM BELLADONNÆ SEMINUM, O. B. BACCÆ, L. From the seeds or berries of *Atropa belladonna* or deadly nightshade. Yellow; insipid. *Used* for lamps in Swabia and Wurtemberg, and as an application to bruises. The marc is poisonous. It freezes at 34° Fahr. Sp. gr. ·9250.

Oil of Ben. *Syn.* OIL OF BEHEN; OLEUM BALATINUM. From the seeds of *Moringa pterygosperma* (ben nuts). Scentless, colourless; keeps long without growing rank; by standing, it separates into two parts, one of which freezes with difficulty, and is hence much used in perfumery.

Oil of Benne Seed. See OIL OF GINGELLY (*below*).

Oil of Brazil-nuts. *Syn.* OLEUM BERTHOLLETIÆ. From the kernels of the fruit of *Bertholletia excelsa*, or Brazil-nuts. An oil of a bright amber colour, congealing at 24° Fahr. Sp. gr. ·917. It has been used as a substitute for olive oil in plasters and ointments.

Oil of Caca'o. *Syn.* BUTTER OF C.; OLEUM CACAO CONCRETUM, BUTYRUM CACAO, L. From the seeds of *Theobroma Cacao*, or chocolate nuts, gently heated over the fire, and then decorticated, and pressed between hot iron plates. Sp. gr. ·892.

Oil, Cas'tor. *Syn.* RICINI OLEUM (B. P.), OLEUM CASTOREI, O. RICINI (Ph. L. E. & D.), L. "The oil prepared by heat, or by pressure, from the seed" of "*Ricinus communis*, Linn." (Ph. L.), the *Palma Christi*, or Mexican oil-bush.

The best castor oil (COLD-DRAWN CASTOR OIL; OLEUM RICINI SINE IGNE) is prepared by pressing the shelled and crushed fruit (seed) in hemp bags, in an hydraulic press, and heating the oil thus obtained along with water in well-tinned vessels, until the water boils and the albumen and gum separate as a scum; this is carefully removed, and the oil, as soon as it has

TABLE *giving the reactions of various* OILS *with* SULPHURIC ACID *and with a saturated solution of* BICHROMATE OF POTASSA *in sulphuric acid.* Re-arranged from M. PENOT'S table, with additions, by Mr. COOLEY.

⁂ *The result indicated is obtained in each case by the action of* one drop *of the* REAGENT *on* twenty drops *of* OIL.

NAME OF OIL.	REAGENTS.		
	Sulphuric Acid.		Saturated Solution of Bichromate of Potassa in Sulphuric Acid.
	Not stirred.	*Stirred.*	*Stirred.*
Almond oil . . .	Greenfinch yellow, with orange spots	Dirty green	Yellowish, small lumps.
Castor oil . . .	Yellow, with slight spots	Little reaction	Slightly green.
Cod-liver oil (*fine sample of pale oil*)	Deep purple in the centre, rapidly turning brown, whilst violet or purple clouds or streaks spread out towards the circumference, the colour of which remains unaltered for some minutes after the central portion has turned nearly black	Deep purple, passing into purple brown, reddish brown, and gradually deepening to an intense brown, approaching black	Reddish-brown clots, changing to a clear bright green.
Hemp-seed oil . . .	Small brown lumps or clots on a yellow ground	Greenish brown	Small yellow lumps or clots on a green ground.
Linseed oil (*from the Upper Rhine*)	Dark reddish brown	Brown small lumps on a gray ground	Brown small lumps on an almost colourless ground.
„ (*from Paris*)	Reddish brown, less dark coloured	Brown clots on a green ground	Brown small lumps on a green ground.
„ (*English*) .	Chestnut brown	Brown clots on a greenish-gray ground	Brown lumps on a greenish-gray ground.
Liver-train oil . . .	Dark red	Dark red	Dark red.
Madia-sativa oil . .	Slightly reddish brown underneath a thin grayish film	Olive green	Light brown small lumps on an olive-coloured ground.
Black-mustard oil . .	Bluish green	Olive green	Olive brown.
Neat's-foot oil . .	Yellow slight spots	Dirty brown	Brown spots on a brownish ground.
Nut oil (*recent*) . .	Yellowish brown.	Clotted, dark brown	Small brown lumps or clots.
„ (*one year old*) .	Yellow	Dirty brown, less dark coloured	Small brown lumps.
„ (*still older*) . .	Orange yellow	Dirty brown	Small brownish lumps.
Olein, oleic acid, lard, or tallow oil . . .	Reddish spots, with reddish circles	Reddish brown	Bright chestnut colour.
Olive oil	Yellow	Dirty brown	Olive brown.
„ (*another sample*)	Orange yellow	Brownish gray	Brown.
„ (*from fermented olives*) . .	Orange yellow	Brownish gray	Brown.
Poppy oil (*recent cold drawn*) .	Yellow spots	Olive brown	Small yellow lumps on a white ground.
„ (*recent,* expressed with slight heat) .	Greenish-yellow spots	Olive brown, turning more on the green	Small yellow lumps on a greenish-gray ground.
„ (*one year old, expressed with heat*)	Greenish spots	Olive green	Small yellow lumps on a green ground.
Rape or colza oil (*trade*) .	Yellowish-brown streaks surrounded by a bluish-green ring	Brownish, turning on the olive green	Yellow small lumps on a green ground.
„ (*recent*) .	Green	Bluish green	Yellow small lumps on a green ground.
„ (*one year old*)	Green	Bluish green	Yellow lumps on a brighter green ground.
„ (*one year old, rough hot-pressed*)	Green	Olive green	Small yellow lumps, more numerous, on an olive-green ground.
Whale-train oil . .	Small reddish lumps on a brownish ground	Resembles wine lees	Small, bright, chestnut-coloured lumps on a brown ground.

become cold, is filtered through Canton flannel, and put into canisters. The commoner kinds are prepared by gently heating the crushed seeds, and pressing them whilst hot. Another method, sometimes adopted, is to put the crushed seed into loose bags, to boil these in water, and to skim off the floating oil.

Prop. It is the most viscid of all the fixed oils; when pure, it mixes in all proportions with alcohol and ether, and also dissolves, to a certain extent, in rectified spirit, but a portion of the oil separates on standing. Camphor and benzoic acid increase its solubility in spirit. By long exposure to the air, it becomes rancid, thick, and is ultimately transformed into a transparent yellow mass; light hastens these changes. Exposed to cold, a solid, white, crystalline fat separates from the liquid portion, and when cooled to 0° it congeals into a yellow transparent mass, which does not again liquefy until the temperature rises to about 18° Fahr. Sp. gr. ·9611 to ·9612, at 60°; ·9690, at 55° (Saussure); ·9575, at 77° (Saussure). *Prod.* 38 to 40% (62%—Ure).

Pur. Castor oil is sometimes adulterated with rape oil or with lard oil, a fraud which may be detected by its diminished density; and, when the added oil exceeds 33%, by its insolubility in its own weight of alcohol of ·820. In many cases croton oil is added to increase the purgative quality of the mixture. A compound of this kind is vended in gelatine capsules under the name of 'CONCENTRATED CASTOR OIL,' the use of which is fraught with danger. "I have heard of several cases in which very violent and dangerous effects were produced by these capsules." (Pereira.) The best is imported from the East Indies in tin canisters. The oil obtained from the seeds of *Ricinus viridis* (Willd.), or lamp-oil seeds, is often mixed with or sold for castor oil.

Uses, &c. Castor oil is an exceedingly useful mild purgative, particularly when abdominal irritation should be avoided, as in inflammations of the stomach and bowels, pregnancy, surgical operations, &c.—*Dose.* 2 fl. drs. to 1 fl. oz.

Oil, Co'coa-nut. *Syn.* COCOA-NUT BUTTER; OLEUM COCOIS NUCIFERÆ, L. By expression from the kernels of the cocoa nut, or fruit of the *Cocos nucifera.*

Oil, Cod-liver. *Syn.* MORRHUÆ OLEUM (B. P.), COD-FISH OIL; OLEUM JECORIS ASELLI, O. GADI, O. G. MORRHUÆ, OLEUM MORRHUÆ (Ph. L.), L. "The oil extracted from the fresh liver of the *Gadus morrhua* by a steam heat or water-bath not exceeding 180° Fahr. Yellow." "The oil prepared from the liver of *Gadus morrhua,* Linn." (Ph. L.)

The common cod-liver oil of commerce drains from the livers of the cod-fish when freely exposed to the sun, and just beginning to putrefy. It is dark coloured, strong, and nauseous, and is now chiefly employed in this country by the curriers, for dressing leather. It is the 'OLEUM JECORIS ASELLI FUSCUM' of Continental writers. Formerly, the less fetid varieties of this crude oil, after the impurities were removed, either by subsidence or filtration, constituted the only cod-liver oil used in medicine. As its employment as a remedy increased, its revolting flavour, and its great tendency to permanently disorder the stomach and bowels, was found, however, to be a serious obstacle to its general use. It was observed that the oil, as it exists in the liver of the cod, is bland, and nearly colourless, and has only a slight fishy, but not a disagreeable flavour. The attention of persons interested was therefore immediately directed to the subject, and improved methods of obtaining the oil were suggested, and ere long adopted on the large scale.

The methods of preparing cod-liver oil are noticed in another part of this work, but we think it advisable to add to these a description of the plan adopted by Messrs. Charles Fox and Co., of Newfoundland, Scarborough, and London, the well-known manufacturers and importers of cod-liver oil:—

"The Newfoundland fisheries are entirely carried on in small boats, principally by the hand-line system, and quite close to the shore. The boats go out early in the morning, and return about four o'clock in the afternoon. The fish, on landing, are handed over to a 'fish-room keeper,' whose duty it is to split and open the fish, and to deposit the livers in small tubs, holding 17 or 18 gallons each. These tubs are soon afterwards collected from the different 'fish-rooms,' and conveyed to the manufactory. The livers are here thrown into tubs filled with clean cold water, and, after being well washed and jerked over, are placed on galvanized iron-wire sieves to drain. They are next put into covered steam-jacket-pans, and submitted to a gentle heat for about three quarters of an hour, after which the steam is turned off, cold air again admitted, and the whole allowed to repose for a short time, during which the livers subside, and the oil separates and floats on the top. The oil is then skimmed off into tin vessels, and passed through flannel strainers into tubs, where it is left to subside for about 24 hours. From these the purer upper portion of oil is run into a very deep, galvanized-iron cistern, and again left to clarify itself by defecation for a few days. It is now further refined, by carefully passing it through clean and very stout mole-skin filters, under pressure. The transparent filtered oil is received in a clean, galvanized-iron cistern, containing a pump, from which the casks are filled for exportation. The latter, before being filled, are carefully seasoned and cleaned, to prevent their imparting either flavour or colour to the pure oil."

The superiority of the oil prepared as above consists essentially in every part of the process of extraction being performed whilst the livers are fresh, and in no chemical means being adopted to give the oil a factitious appearance. Its natural pale colour is thus preserved from contamination, and its medicinal virtues maintained intact.

Much of the light-brown oil of commerce is obtained from *Gadus callarius* (the dorse), *G. carbonarius* (the coal-fish), and *G. pollachius* (the pollack).

Pur., &c. "The finest oil," remarks Dr. Pereira, "is that which is most devoid of colour, odour, and flavour. The oil, as contained in the cells of the fresh liver, is nearly colourless, and the brownish colour possessed by ordinary cod-liver oil is due to colouring matters derived from the composition (putrefying) hepatic tissues and fluids, or from the action of the air on the oil (age). Chemical analysis lends no support to the opinion, at one time entertained, that the brown oil was superior, as a therapeutical agent, to the pale oil. Chemistry has not discovered any substance in the brown oil that would confer on it superior activity as a medicine. On the other hand, the disgusting odour and flavour and nauseating qualities of the brown oil preclude its repeated use. Moreover, there is reason to suspect that, if patients could conquer their aversion to it, its free use, like that of other rancid and empyreumatic fats, would disturb the digestive functions, and be attended with injurious effects." ('Elem. Mat. Med.,' &c., 3rd edit., iii, 2239.)

Among the tests of purity, that generally relied on is known as the 'sulphuric-acid test.' See OILS. (Fixed) *Purity*.

DORSE OIL and other FISH OILS, sold as 'LIGHT-BROWN COD-LIVER OIL,' exhibit with this test much lighter reactions, which closely resemble those of LIVER-TRAIN and WHALE-TRAIN OIL.

To detect the presence of combined iodine, upon which, by some, the therapeutic value of cod-liver oil is thought to depend, the sample is saponified by trituration with a little caustic potassa and hot water, the resulting soap cautiously incinerated, the ashes digested with water, and the whole thrown on a filter. The usual tests for iodine may be then applied to the filtered liquid.

The presence of iodine artificially added is best detected by agitating the oil with a little rectified spirit, and then testing this last for iodine. Or, a little solution of starch and a few drops of sulphuric or nitric acid may be at once added to the oil, when a blue colour will be developed if iodine, or an iodide, has been mixed with the sample.

The sp. gr. of the pale oil is ·9230 to ·9238; of the light-brown oil, ·9240 to ·9245; of the dark-brown oil, ·9290 to ·9315. The density is, however, apt to vary a little with the quantity of moisture present.

Uses, &c. Cod-liver oil is a most valuable medicine in a great variety of diseases, more especially in glandular indurations and enlargements, scrofula, phthisis, rheumatism, gout, certain cutaneous diseases, amenorrhœa, chlorosis, caries, rickets, &c. To be of service, however, its use must be continued for several weeks, and the oil must be recent.—*Dose.* 1 to 2 table-spoonfuls, 3 or 4 times daily, or oftener.

Oil, Col'za. From the seeds of *Brassica campestris*, var. *oleifera*, or *colzu de printemps*, a variety of *Brassicq campestris* (Linn.). It may be regarded as a superior sort of rape oil. Burns well in lamps, especially after being refined. Sp. gr. ·9136. *Prod.* 39%. The term 'colza oil' is commonly applied to ordinary refined rape.

Oil, Cot'ton-seed. *Syn.* OLEUM GOSSIPII SEMINUM, L. From the seed of *Gossypium Barbadense.* Drying.

Oil, Cro'ton. *Syn.* CROTONIS OLEUM (B. P.), OLEUM CROTONIS (Ph. E.), O. TIGLII (Ph. L.), L. From the shelled seeds of *Croton tiglium* or Molucca grains. Imported chiefly from the East Indies. It is one of the most powerful cathartics known, and acts when either swallowed or merely placed in the mouth. *Externally*, it is rubefacient and counter-irritant, often causing a crop of painful pustules, like tartar emetic.—*Dose.* 1 to 2 drops, on sugar; in apoplexy, &c. It is poisonous in larger doses. Sp. gr. ·947 to ·953. *Prod.* Unshelled seeds, 22% to 20%; shelled do., 32% to 35%.

Pure croton oil is soluble in an equal volume of alcohol of ·796, but in 2 or 3 days about 96% of the oil separates. In France the marc is exhausted with alcohol, and the oil thus obtained is added to that previously obtained from the same seeds by expression. The East Indian oil (OLEUM CROTONIS EXOTICUM) is usually of a pale yellow; that pressed in England (O. CROTONIS ANGLICANUM) is much darker.

Oil of Cu'cumber. *Syn.* OLEUM CUCURBITÆ, L. From the seeds of *Cucurbita pepo* or squash, and the *C. melopepo* or pumpkin. Pale; used in lamps; and, sometimes, as a soothing application to piles. Sp. gr. ·9231. *Prod.* 24%.

Oil of Eggs. *Syn.* OLEUM OVI, O. O. VITELLI, O. OVORUM, L. From the yolks of eggs, gently heated until they coagulate and the moisture has evaporated, and then pressed or broken up, digested in boiling rectified spirit, the tincture filtered whilst hot, and the spirit distilled off. Bland; emollient. The common plan is to fry the yolks hard; but the oil is then darker coloured and stronger. The P. Cod. orders them to be exhausted with ether, by displacement. Formerly commonly used to "kill" quicksilver, and still held in great esteem in some parts of England for sore nipples and excoriations. *Prod.* 10 to 12 eggs yield 1 oz. See MIXED OILS.

Oil of Gar'den Cress. *Syn.* OLEUM LEPIDII SATIVI, L. From the seed. Drying. Sp. gr. ·9240. *Prod.* 54%.

Oil of Garden Spurge. *Syn.* OLEUM LA-

THYRIS, O. EUPHORBIÆ L., L. From the seeds of *Euphorbia lathyris* or garden spurge. Cathartic. *Dose.* 3 to 8 drops. Sp. gr. ·9281. *Prod.* 30% to 41%. Croton oil mixed with 6 times its weight of nut or rape oil is usually sold for it.

Oil of Gingel'ly. *Syn.* OIL OF SESAMUM, BENNE OIL, TEEL O., TEL O.; OLEUM SESAMI, L. From the seeds of *Sesamum orientale* (Willd.), or gingelly. Pale; bland. *Used* in salads, paints, &c.; also to addlterate oil of almonds. *Prod.* 46%.

Oil, Gourd. See CUCUMBER OIL.

Oil of Ground Nuts. From the nuts of *Arachis hypogæa.* Glutinous.

Oil of Hemp. *Syn.* OLEUM CANNABIS, L. From the seed of *Cannabis sativa* (Linn.), or common hemp. Mawkish. Sometimes used for frying, but chiefly for paints, soaps, &c. Freely soluble in boiling alcohol; does not thicken until cooled to 5° Fahr. Sp. gr. ·9276. *Prod.* 18% to 24%.

Oil of Jatro'pha. *Syn.* OIL OF WILD CASTOR SEEDS; OLEUM JATROPHÆ, L. From the seeds of *Jatropha purgans.* Somewhat resembles CROTON OIL. *Used* for lamps in the East Indies.

Oil, Kun'dah. *Syn.* TALLICOONAH O.; OLEUM TOULOUCOUNÆ, L. From the fruit of *Carapa Touloucouna.* Rancid, nauseous, vermifuge, rubefacient, emetic, and purgative. Chiefly used in lamps.

Oil, Lard. *Syn.* TALLOW O., CRUDE OLEIN, C. OLEIC ACID; OLEUM ADIPIS, L. By separating the olein of lard from the stearin by means of boiling alcohol. Only applicable where spirit is cheap. The product is, however, excellent. The crude oleic acid, or lard oil of commerce, is chiefly obtained as a secondary product in the manufacture of stearin. It is purified by agitation with sulphuric acid, and subsequently by steaming it, or washing it with hot water. Burns well in lamps, if the wick-tube is kept cool. Sp. gr. ·9003.

Oil, Linseed. *Syn.* OLEUM LINI (B. P., Ph. L. E. & D.), L. 1. (COLD-DRAWN LINSEED OIL; OLEUM LINI SINE IGNE.) From the seed of *Linum usitatissimum* (Linn.), or common flax, bruised or crushed, and then ground and expressed without heat. Pale, insipid, viscous; does not keep so well as the next. *Prod.* 17% to 20%.

2. As the last, but employing a steam heat of about 200° Fahr. Amber coloured; less viscous than the last; congeals at 2°; soluble in 5 parts of boiling and 40 parts of cold alcohol. Both are drying and cathartic.—*Dose.* 1 to 2 oz.; in piles, &c. Chiefly used in paints, varnishes, &c. Sp. gr. ·9347. *Prod.* 22% to 27%.

3. (BOILED LINSEED OIL.) See OILS (Drying).

Oil of Mace (Expressed). See OIL OF NUTMEG (Expressed).

Oil of Mustard. *Syn.* OLEUM SINAPIS, L. 1. (OIL OF WHITE MUSTARD.) From *Sinapis alba*, or white mustard, but chiefly from *Sinapis arvensis*, *S. chinensis*, *S. dichotorna*, *S. glauca*, *S. ramosa*, and *S. tori.* Sweet. *Used* for the table. Sp. gr. ·9142 (·2160—Ure). *Prod.* 36%.

2. (OIL OF BLACK MUSTARD; OLEUM SINAPIS NIGRI, L.) From the 'hulls' of black-mustard seed. Viscid, stimulant. *Used* in rheumatism. Sp. gr. ·9168 to ·9170. See OILS (Volatile).

3. (OIL OF WHITE MUSTARD; OLEUM RAPHANI, L.) From the seed of *Raphanus Raphanistrum* (Linn.), or jointed charlock or wild mustard. *Prod.* 30%.

Oil, Neat's-Foot. *Syn.* NERVE OIL, TROTTER O.; OLEUM BUBULUM, O. NERVINUM, AXUNGIA PEDUM TAURI, L. From neat's-fee and tripe, by boiling them in water, and skimming off the oil. Does not thicken by age. *Used* to soften leather, to clean fire-arms, and for other purposes.

Oil, Nut. *Syn.* HAZEL-NUT O.; OLEUM NUCIS, O. CORYLI, L. From the kernels of *Corylus Avellana* (Linn.), or hazel-nut tree. Pale, mild tasted, drying; superior to linseed oil for paints and varnishes. It is commonly sold for oil of almonds and oil of ben, and is extensively employed to adulterate both. Walnut oil is also frequently sold for nut oil. Sp. gr. ·9260. *Prod.* 60% (Ure).

Oil of Nut'meg (Expressed). *Syn.* EXPRESSED OIL OF MACE, BUTTER OF M.; OLEUM MYRISTICÆ (CONCRETUM) (Ph. L.), MYRISTICÆ ADEPS (Ph. E.), M. BUTYRUM, O. MYRISTICÆ EXPRESSUM (B. P.), O. MOSCHATÆ, O. NUCISTÆ, L. "The concrete oil expressed from the seed of *Myristica officinalis*," Linn. (Ph. L.), or common nutmeg. The nutmegs are beaten to a paste, enclosed in a bag, exposed to the vapour of hot water, and then pressed between heated iron plates. Orange coloured, fragrant, spicy; butyraceous, or solid. It is a mixture of the fixed and volatile oils of the nutmeg. When discoloured and hardened by age, it is called 'BANDA SOAP' (OL. MACIS IN MASSIS). When pure, it is soluble in 4 parts of boiling alcohol and in 2 parts of ether. It has been used in rheumatism and palsy, but is now chiefly employed for its odour and aromatic qualities. From the East Indies. *Prod.* 17% to 20%.

Oil, Ol'ive. *Syn.* SALAD OIL, SWEET O.; OLIVÆ OLEUM (B. P.), OLEUM OLIVARUM, O. OLIVÆ (Ph. L. E. & D.), L. The "oil expressed from the fruit" of "*Olea europæa*, Linn." (Ph. L.), or common olive. Five different methods are employed to obtain the oil from the fruit:—

1. (VIRGIN OIL; O. O. VIRGINEUM, L.); HUILE VIERGE, Fr.) From olives, carefully garbled, either spontaneously or only by slight pressure, in the cold. That yielded by the pericarp of the fruit is the finest.

2. (Ordinary 'FINE OIL.') This is obtained by either pressing the olives, previously crushed and mixed with boiling water, or by pressing,

at a gentle heat, the olives from which the virgin oil has been obtained. The above processes furnish the finer salad oils of commerce. The cake which is left is called 'GRIGNON.'

3. (SECOND QUALITY.) By allowing the bruised fruit to ferment before pressing it. Yellow; darker than the preceding; but mild and sweet tasted. Much used for the table.

4. ('GORGON.') By fermenting and boiling the pressed cake or marc in water, and skimming off the oil. Inferior.

5. (OIL OF THE INFERNAL REGIONS; OLEUM OMPHACINUM) is a very inferior quality of oil, which is skimmed off the surface of the water in the reservoirs into which the waste water which has been used in the above operations is received, and allowed to settle. The last two are chiefly used for lamps, and in soap-making, &c.

Of the principal varieties of olive oil known in commerce, and distinguished by the place of their production, '**PROVENCE OIL**' is the most esteemed; '**FLORENCE OIL**' and '**LUCCA OIL**' are also of very fine quality; '**GENOA OIL**' comes next, and then '**GALLIPOLI OIL**,' which forms the mass of what is used in England; '**SICILY OIL**,' which has a slightly resinous flavour, is very inferior; and '**SPANISH OIL**' is the worst imported.

Prop., *&c.* Olive oil is a nearly inodorous, pale greenish-yellow, unctuous fluid, with a purely oleaginous taste, peculiarly grateful to the palate of those who relish oil. It does not suffer active decomposition at a heat not exceeding 600° Fahr.; and when cooled to 36° it congeals into a granular solid mass. It is very slightly soluble in alcohol, but its solubility is increased by admixture with castor oil. It is soluble in 1¼ part of ether. When pure, it has little tendency to become rancid. Sp. gr. ·9170 to ·9173; .9192, at 53¼° (Saussure); ·9176, at 59° (Heidenreich); and ·9109, at 77° Fahr. (Saussure). *Prod.* 32%, of which 21% is furnished by the pericarp, and the remainder, which is inferior, by the seed and woody matter of the fruit.

Pur. Olive oil, with the exception of that of almonds, being the most costly of the ordinary fixed oils of commerce, is, consequently, the one most subject to adulteration. Nut, poppy, rape, and lard oil, are those most commonly used for this purpose. Refined tallow olein, including that obtained from the 'knackers' yards' of Paris, is said to have been used in the same way. The addition of any other oil to olive oil renders it far less agreeable to the palate, and, by increasing its tendency to rancidity, much more likely to offend and derange the stomach and bowels of those who consume it. Parties who indulge themselves in the use of this luxury would, therefore, do well to ascertain that what they purchase is pure. When pure, and also fresh, olive oil is most wholesome as an article of food or as a condiment.

The detection of the sophistication of salad oil is a matter of no great difficulty. The palate of the connoisseur will readily perceive the slightest variation in the quality of his favourite condiment. Other methods, however, of a more accurate and certain description, and of more general application, are adopted. Amongst these, in addition to those mentioned above, are the following:—

a. When pure olive oil is shaken in a phial, only half filled, the 'bead' or bubbles rapidly disappear; but if the sample has been mixed with poppy or other oil, the bubbles continue longer before they burst.

b. Olive oil congeals at 36° Fahr., and is completely solidified when a small bottle containing it is surrounded by ice, or a freezing mixture; but when mixed with poppy oil, it remains partly liquid, even when the latter forms only 1-4th of the mass; if more than 1-3rd of poppy oil is present, it does not solidify at all, unless cooled much below the freezing point of water.

c. (Ph. E.) When olive oil is "carefully mixed with $\frac{1}{12}$th part of its volume of a solution of 4 oz. of mercury in 8 fl. oz. 6 drs. of nitric acid (sp. gr. 1·500), it becomes in 3 or 4 hours like a firm fat, without any separation of liquid oil."

d. M. Pontet recommends the mercurial solution to be made by dissolving 6 parts of mercury in 7½ parts of nitric acid (sp. gr. 1·35), without heat; of this solution he adds 1 part to every 48 parts of the oil, and well shakes the mixture every 30 minutes, until it begins to solidify. This it does after about 7 hours in summer and 4 or 5 hours in winter, and when the oil is pure it will have formed, in 24 hours, a mass so hard that some little force must be employed to thrust a glass rod into it. The other edible oils do not furnish a hard mass with nitrate of mercury. The solidity of the mass is exactly in proportion to the quantity of foreign oil present. When the sophistication is equal to 1-8th of the whole, a distinct liquid layer separates; when the mixture contains ¼ its volume of an inferior oil, one half only of the mixture becomes solid, and the other half continues liquid. A temperature of about 90° Fahr. is the best to cause the oil and coagulum to separate then perfectly from each other. When the oil has been adulterated with animal oil, the mixture solidifies in about five hours; but in this case the coagulum consists of the animal oil, whilst the olive oil floats on the surface, and may be decanted for further examination. This coagulum, on being heated, exhales the well-known odour of rancid fat or melted tallow.

Uses, *&c.* The dietetical uses of olive oil are well known. In Spain and Italy it is commonly employed as a substitute for butter. It is highly nutritious, but is digested with difficulty by some persons, and hence should be avoided by the dyspeptic. Like almond oil, it is occasionally employed as a laxative and vermifuge, and is, perhaps, one of the mildest known. In pharmacy it is extensively employed in the preparation of cerates, liniments, ointments, and plasters.—*Dose*. For an adult, ½ to 1 wine-glassful as a mild aperient; for an infant, ½ to 1 teaspoonful, mixed up with an equal quantity of honey, syrup of roses, or syrup of violets. The white fibrous sediment which forms in the recently expressed oil is the 'AMURCA' of Pliny, and was formerly highly esteemed in medicine.

Oil, Olive, Droppings. *Syn.* SWEET-OIL D. The 'foots' or 'deposits,' and the 'drippings' of the casks, cisterns, and utensils. *Used* for machinery, making soap, &c.

Oil, Olive (Oxygenated). *Syn.* OLEUM OLIVÆ OXYGENATUM (Ph. Batav), L. Olive oil, 16 oz., is placed in a receiver surrounded with ice or very cold water, and chlorine is slowly transmitted through it for several days, or until it becomes thick and viscid, after which it is well washed with warm water.

Oil, Palm. *Syn.* PALM BUTTER; OLEUM PALMÆ, L. From the fruit of *Elais Guineensis*, and *E. melanococca*, the Guinea oil palms. Orange or red coloured; butyraceous or solid; smells of violets; unchanged by alkalies; bleached by sunlight, age, exposure, chlorine, chromic acid, and oil of vitriol; melts at 117½° Fahr. Sp. gr. ·968. Demulcent. *Used* to colour and scent ointments, pommades, &c.; but chiefly to make soap and candles. From Africa.

Oil, Pi''ney. *Syn.* PINEY TALLOW, P. DAMMAR, P. RESIN. From *Vateria Indica* (Linn.), or pænoe tree. Resinous flavoured, fragrant; made into candles. Sp. gr. ·926.

Oil, Pop'py. *Syn.* OLEUM PAPAVERIS, L.; OLIETE, HUILE BLANCHE, Fr. From the seeds of *Papaver somniferum* (Linn.), or white poppy. Sweet; pale; dries and keeps well. *Used* for salads, paints, and soaps; also (extensively) to adulterate almond oil, for the inferior qualities of which it is frequently sold. It does not freeze until cooled to 0° Fahr. Sp. gr. ·9243 to ·9245. *Prod.* 48% to 54%.

Oil, Rape. *Syn.* COLZA OIL, BROWN O.; OLEUM RAPÆ, L. From the seed of *Brassica Napus* (Linn.; cole or rape), and from *Brassica campestris* (Linn.; wild navew or rape). Glutinous; buttery at 25° Fahr. Dries slowly; makes soft soaps and good ointments, but bad plasters; smokes much in burning, unless well refined. Sp. gr. ·9135 to ·9136. *Prod.* 32%.

OIL, REFINED or PALE RAPE (OLEUM RAPÆ REFINUM, OL. R. ALBUM) is prepared from crude rape oil, by agitating it with about 2% of oil of vitriol, previously diluted with about twice its weight of water, and, after 10 or 12 days' repose, decanting the clear oil, and filtering it through Canton flannel or felt. The quality is improved by washing it with hot water or steam, before filtration. *Used* for lamps, blacking, and machinery; also extensively employed to adulterate both almond and olive oil. It forms the common 'SWEET OIL' of the oilmen and druggists. Sp. gr. ·9136 to ·9140.

Oil, Seal. *Syn.* OLEUM PHOCÆ, L. From the hood seal, and harp seal, and other species of *Phocidæ*. PALE SEAL OIL is that which drains from the blubber before putrefaction commences, and forms about 60% of the whole quantity of oil obtained. It is very clear, free from smell, and, when recently prepared, not unpleasant in its taste. REFINED SEAL OIL is the last, washed and filtered. Ranks close after sperm oil. BROWN or DARK SEAL OIL is that which subsequently drains from the putrid mass. It is very strong-scented and nauseous, and smokes in burning. Both are used for lamps and dressing leather. A full-grown seal yields 8 to 12 galls. of oil; a small one, 4 to 5 galls.

Oil of Ses'amum. *Syn.* OIL OF GINGELLY (*above*).

Oil, Shark-liver. The lightest of the fixed oils. Sp. gr. ·865 to ·867.

Oil, Skate. *Syn.* OLEUM RAIÆ, L. From the livers of *Raia batis* (Linn.), or common skate, as cod-liver oil; also from *Raia rhinobatus*, or white skate, and *Raia clavata*, or thornback. Often sold and mixed with cod-liver oil.

Oil, Spermace'ti. *Syn.* SPERM OIL; OLEUM CETACEI, L. From the 'head matter' of *Physeter macrocephalus*, or spermaceti whale; a species once common in all the principal seas, but now chiefly confined to the Southern Ocean. It is very limpid, smells little, and burns well; and has long been reputed the best oil for lamps and machinery, as it does not thicken by age or friction. It is frequently adulterated with refined seal oil. Sp. gr. ·875.

Oil, Sun'flower. *Syn.* OLEUM HELIANTHI, L. From the seeds of *Helianthus annuus* and *H. perennis*. Clear, pale yellow, tasteless; thickens at 60° Fahr. *Used* for salads and lamps. Sp. gr. ·9261. *Prod.* 15%.

Oil, Teel. See GINGELLY OIL (*above*).

Oil, Tobac'co-seed. *Syn.* OLEUM TABACI (EXPRESSUM), L. From the seeds of *Nicotiana Tabacum* (Linn.), or true tobacco plant. Pale; dries well; equal to nut oil. Its production has recently been carried on with considerable success in some parts of Russia. Sp. gr. ·9232.

Oil of Touloucou'na. See KUNDAH OIL (*above*).

Oil, Train. See WHALE OIL (*below*).

Oil, Wal'nut. *Syn.* OLEUM JUGLANDIS, O. NUCIS J., L. From the kernels of the nuts of *Juglans regia* (Linn.), or common walnut tree. Soon gets rank; dries well. *Used* in paints, and occasionally in plasters. When 'cold drawn' and washed, it is sometimes eaten with salad. Sp. gr. ·9260 to ·9262. *Prod.* 48% to 52%.

Oil of Wax. *Syn.* BUTTER OF WAX; OLEUM CERÆ, L. From bees' wax, by quick distillation in a close vessel. Butyraceous. By rectification along with quicklime it yields a liquid oil.

Oil, Whale. *Syn.* TRAIN OIL, WHALE-TRAIN O.; OLEUM BALÆNÆ, O. CETI, L. From the blubber of the *Balæna mysticetus* (Linn.), or the common or Greenland whale, by heat. Coarse; stinking. SOUTHERN WHALE OIL is the best. *Used* for lamps, machinery, &c. Sp. gr. ·9231. *Prod.* per fish, about 1½ ton for each foot of bone.

Oil of Wheat. *Syn.* OLEUM TRITICI, L. From bruised Colne wheat, with heat. In chilblains, ringworm, and several other skin diseases.

Oil of Wine-stones. *Syn.* GRAPE-STONE OIL; OLEUM VITIS VINIFERÆ LAPIDUM, L. From the seeds of grapes, separated from the marc. Pale yellow, bland, emollient. *Used* for salads and lamps. Sp. gr. ·9202. *Prod.* 14⅔ to 18⅔.

*** The numbers given above, under 'products,' unless when otherwise stated, refer to the respective fruits, kernels, nuts, seeds, &c., deprived of their husks, pods, shells, and every other portion destitute of oil.

OILS (Medicated). *Syn.* OLEA COCTA, O. INFUSA, O. MEDICATA, L. These are prepared by infusion or decoction. The bruised ingredients are either simply digested in 2 to 4 times their weight of olive oil for some days, or they are gently boiled in it until they become dry and crisp, great care being taken that the heat towards the end of the process is not greater than that of boiling water. As soon as the process is complete, the oil is allowed to drain from the ingredients, which are then (if necessary) submitted to the action of the press. The product is commonly run through flannel or a hair sieve whilst still warm, after which it is allowed to repose for a week or ten days, when the clear portion is decanted from the dregs. The green or recent plants are usually employed for this purpose, but, in many cases, the dried plants, reduced to powder, and digested for 6 or 8 hours in the oil, at the heat of hot water, with frequent agitation, yield a much more valuable product. They are nearly all employed as external applications only.

*** The following are the most important preparations of this class:—

Oil of Adder's Tongue. *Syn.* OLEUM OPHIOGLOSSI, L. From the herb, as OIL OF BELLADONNA. A popular vulnerary.

Oil of Belladon'na. *Syn.* OLEUM BELLADONNÆ (P. Cod.), L. *Prep.* From the fresh leaves, bruised, 1 part; olive oil, 4 parts; digested together at a gentle heat until the moisture is evaporated; the oil is then strained off, with pressure, and filtered.

Oil of Cantha'rides. *Syn.* OLEUM CANTHARIDIS, O. CANTHARIDIBUS, L. *Prep.* (P. Cod. 1839.) From Spanish flies (powdered), 1 part; olive oil, 8 parts; as OIL OF BELLADONNA. Stimulant and rubefacient. *Used* as a dressing to indolent sores, blisters, &c.; and in dropsy, rheumatism, gout, &c. OIL OF THE OIL-BEETLE (*Meloe proscarabæus*—Linn.) is prepared in a similar manner.

Oil of Cap'sicum. *Syn.* OLEUM CAPSICI, L. *Prep.* (Dr. Turnbull.) From powdered capsicum or Cayenne pepper, 4 oz., olive oil, 1 pint; digested together for 6 hours, with heat, and strained. Stimulant; rubefacient in colic, cholera, &c.

Oil of Cham'omile. *Syn.* OLEUM ANTHEMIDIS, OL. CHAMÆMELI, L. From the dried flowers (rubbed to pieces), 1 part, olive oil, 8 parts; digested together, with heat, for 6 hours. Stimulant, emollient, and vermifuge.

Oil of Col'ocynth. *Syn.* OLEUM COLOCYNTHIDIS, L. From the pulp, as OIL OF CHAMOMILE. Diuretic. In dropsy, neuralgia, rheumatism, worms, &c.

Oil of Elder-flowers. *Syn.* WHITE OIL OF ELDER; OLEUM SAMBUCI ALBUM, O. SAMBUCINUM (P. Cod.), L. *Prep.* From the flowers, as OIL OF CHAMOMILE. Emollient and discussive.

Oil of Elder-leaves. *Syn.* GREEN OIL, GREEN OIL OF ELDER, OIL OF SWALLOWS; OLEUM VIRIDE, O. SAMBUCI VIRIDE, L. *Prep.* 1. Green elder leaves, 1 lb.; olive oil, 1 quart; boil gently until the leaves are crisp, press out the oil, and again heat it till it turns green.

2. As before, but by maceration, at a heat under 212° Fahr. More odorous than the last.

3. Elder leaves, 1 cwt.; linseed oil, 3 cwt.; as No. 1.

Obs. The last form is the one usually employed on the large scale. It is generally coloured with verdigris, ½ lb. to the cwt., just before putting it into the casks, and whilst still warm; as, without great skill and a very large quantity of leaves, the deep-green colour so much admired by the ignorant cannot be given to it. The oil is got from the leaves by allowing them to drain in the pan or boiler (with a cock at the bottom), kept well heated. Emollient; in great repute among the vulgar as a liniment, in a variety of affections.

Oil of Fen'ugreek. *Syn.* OLEUM FŒNI-GRÆCI, L. *Prep.* (P. Cod.) From the seeds, as OIL OF CANTHARIDES or of CHAMOMILE. Emollient and resolvent.

Oil of Fox'glove. *Syn.* OLEUM DIGITALIS, L. *Prep.* (P. Cod.) From the fresh leaves, as OIL OF BELLADONNA. *Used* as an application to chronic ulcers and indurations, painful swellings, &c. As usually met with, it is nearly inert.

Oil of Garden Night'shade. *Syn.* OLEUM SOLANI, L. *Prep.* (P. Cod.) From the leaves, as OIL OF BELLADONNA. Anodyne and discussive.

Oil of Gar'lic. *Syn.* OLEUM ALLII INFUSUM, L. From garlic, as OIL OF BELLADONNA. *Used* as a liniment in deafness, diarrhœa, infantile convulsions, palsy, rheumatism, &c.

Oil, Green. *Syn.* OLEUM VIRIDI, L. From bay leaves, origanum, rue, sea wormwood, and elder leaves, of each, 2½ oz.; olive oil, 1 quart; as OIL OF ELDER. Detergent, stimulant, and resolvent. Green oil of elder is now usually sold for it.

Oil of Hem'lock. *Syn.* OLEUM CONII, L. *Prep.* (P. Cod.) As OIL OF BELLADONNA. Anodyne and emollient; in painful ulcers, glandular tumours, &c.

Oil of Hen'bane. *Syn.* OLEUM HYOSCYAMI, L. *Prep.* (P. Cod.) As OIL OF BELLADONNA. *Used* as the last, in various painful local affections.

Oil of Ju″niper (by Infusion). *Syn.* OLEUM JUNIPERI INFUSUM, L. From the crushed berries, as OIL OF BELLADONNA. Diuretic and vulnerary; in frictions, &c.

Oil of Lil'ies. *Syn.* OLEUM LILIORUM, L. From white lilies, 1 lb.; olive oil, 3 lbs.; as OIL OF BELLADONNA. Emollient; *used* to soften and ripen tumours, indurations, &c.

Oil of Mel'ilot. *Syn.* OLEUM MELILOTI, L. As the last, avoiding much heat. Emollient and resolvent.

Oil of Mu'cilages. *Syn.* OLEUM MUCILAGINUM, O. CUM MUCILAGINIBUS, L. *Prep.* 1. (Ph. L. 1746.) Marshmallow root, ½ lb.; linseed and fenugreek seed, of each, bruised, 3 oz.; water, 1 quart; boil 1 hour, add of olive oil, 2 quarts, and boil until the water is consumed.

2. Fenugreek seeds, 8 oz.; linseed oil, 1 quart; infuse a week, and strain. Once a highly popular emollient application in various local affections.

Oil of Mu'dar. *Syn.* OLEUM MUDARIS, L. From mudar bark (in coarse powder), 1 dr.; warm olive oil, ½ pint; digest 24 hours and strain. *Used* as an application to cutaneous ulcers, the bites of venomous animals, &c., and as a friction in worms.

Oil of O″pium. *Syn.* ANODYNE OIL, OPIATED O.; OLEUM OPIATUM, L. *Prep.* From opium (in powder), 1 dr.; olive oil, 2½ fl. oz.; digest at a gentle heat, with frequent agitation, for 5 or 6 hours. The powder should be rubbed in a mortar with a few drops of the oil before adding the remainder. As a local anodyne. The above is the only reliable formula for this preparation. Others are extant, but whilst the products of several are much stronger, those from others have only 1-5th or 1-6th the strength.

Oil of Pel'litory. *Syn.* OLEUM PYRETHRI, L. From bruised pellitory root, as OIL OF BELLADONNA. *Used* as the last.

Oil of Black Pep'per (by Infusion). *Syn.* OLEUM PIPERIS INFUSUM, L. From black pepper, in coarse powder, as OIL OF CAPSICUM. Stimulant and rubefacient; in frictions.

Oil of Poison Oak. *Syn.* OLEUM RHOIS TOXICODENDRI, L. From the leaves, as OIL OF BELLADONNA. Externally; in paralysis, &c.

Oil of Rhu'barb. *Syn.* OLEUM RHEI, L. From rhubarb (in powder), 1 part; oil of almonds, 8 parts; digested together in a gentle heat for 4 hours, and strained, with expression. As an application to indolent ulcers, and as a friction over the abdomen in diarrhœa, English cholera, &c., or as a laxative when the stomach will not bear medicine.

Oil of Ro″ses. *Syn.* OLEUM ROSÆ, O. ROSACEUM, O. R. INFUSUM, O. ROSATUM, L. *Prep.* From the fresh petals, pulled to pieces, crushed, and digested for 2 or 3 days in the sun, or a warm situation, in 4 times their weight of olive oil, and then pressed; the process being repeated with fresh roses. Ph. E. 1744 and P. Cod. are nearly similar. ALMOND, BEN, or OLIVE OIL, coloured with ALKANET, and scented with attar of roses, is now almost universally sold for it. *Used* for the hair.

Oil of Rue. *Syn.* OLEUM RUTÆ (INFUSUM), L. *Prep.* (P.Cod.) From fresh rue, bruised, as OIL OF CHAMOMILE. Reputed antispasmodic, emmenagogue, stimulant, and vermifuge. In frictions.

Oil of St. John's Wort. *Syn.* OLEUM HYPERICI (Ph. L. 1746), O. H. SIMPLEX, BALSAMUM H., L. From the flowers, 1 part; olive oil, 6 parts; digested together until the oil is well coloured. Antispasmodic, stimulant, and resolvent. A mixture of equal parts of RAPE OIL and GREEN ELDER OIL is usually sold for it.

Oil of Scam'mony. *Syn.* OLEUM SCAMMONII, O. PURGANS, L. *Prep.* (Van Mons.) From scammony (in powder), 1 dr.; hot oil of almonds, 3 fl. oz.; triturate together until cold, and the next day decant the clear portion. *Dose,* ½ to 1 table-spoonful.

Oil of Stramo″nium. *Syn.* OLEUM STRAMONII, L. *Prep.* (P. Cod.) From the leaves of thorn apple or stramonium, as OIL OF BELLADONNA. Anodyne and discussive; as an aoplication to painful tumours, joints, &c.

Oil of Tobac'co (by Infusion). *Syn.* OLEUM TABACI, O. T. INFUSUM, L. From fresh tobacco leaves (bruised), like OIL OF CHAMOMILE. As an application in ringworm, irritable ulcers, pediculi, &c.; and as a friction in itch, neuralgia, painful indurations, &c. It must be used with extreme caution, as it is poisonous.

Oil of Tooth'wort. *Syn.* OLEUM SQUAMARIÆ, L. From the herb of *Lathræa squamaria* (Linn), as OIL OF ST. JOHN'S WORT. Astringent and vulnerary. This must not be confounded with another preparation sometimes called 'OIL OF TOOTHWORT' (OLEUM PLUMBAGINIS EUROPÆÆ), and which has been occasionally used in itch, as the latter is acrid and apt to cause much irritation.

Oil of Worm'wood. *Syn.* OLEUM ABSINTHII, L. From the fresh herb, as OIL OF LILIES. The P. Cod. and Ph. Wurtem. order only 1 part of the herb to 8 parts of oil. Applied to the abdomen in dyspepsia, diarrhœa, heartburn, worms, &c. It is seldom used in this country.

OILS (Mineral). *Syn.* HYDROCARBON OILS. An important class of liquids, consisting solely of carbon and hydrogen—the elements of ordinary coal-gas, and obtained, by the distillation of coal, lignite, petroleum, and other bituminous substances. For the purposes of illumination, many of these oils are in most respects superior to the fixed or fat oils containing oxygen. They give a whiter and more brilliant light, and are produced at a much lower cost. The lamps in which they are burnt, when properly constructed, are less liable to get out of order than those adapted for the combustion of fat oils, and require less attention when in use. The experiments of Dr. Frankland on the relative value of the ordinary illuminating agents,[1] prove that the mineral oils are cheaper than all other portable illuminating agents in common use, and that they give, while burning, the largest amount of light with the least development of heat, and the smallest production of carbonic acid. With the oils adapted for burning in lamps other oils are produced. Some are very volatile and highly inflammable, and the safety of the burning oils depends on their proper extraction. These volatile liquids, when isolated, are used in the arts as substitutes for spirits of turpentine, as solvents for various substances, and to increase the illuminating power of coal-gas. Others are of a greasy nature, and are too heavy to be conveniently used in lamps. These, however, are well adapted for lubricating fine machinery, and are extensively employed instead of sperm oil by the cotton manufacturers of Lancashire. The distillation of coal, lignite, and petroleum, has of late become a very extensive and highly important branch of industry, and although great loss of life and property has resulted from accidents with unpurified and explosive mineral oils, the demand for the products is daily increasing. When the more volatile ingredients are separated from the burning oils, the latter are perfectly safe. (See *Tests, below.*)

Hist. For many years the manufacture of burning oils by the distillation of bituminous schists has been extensively carried out on the Continent, but the discovery which formed the foundation of the modern manufacture was made only fourteen years ago by our countryman, Mr. James Young. This gentleman took the lease of a spring of petroleum in 1847, and after numerous experiments succeeded in obtaining two useful oils from the crude liquid; the one being adapted for lubricating machinery, and the other for burning in lamps. The almost total cessation of the flow of petroleum terminated the business after two years' working, and led Mr. Young to institute a series of experiments, to try if petroleum could be produced artificially by the destructive distillation of coal. These experiments resulted in the discovery of an oil which Mr. Young named 'Paraffin oil,' as it had many of the chemical properties of the solid body paraffin, discovered twenty years before by Reichenbach in beech-wood tar. Young's patent (dated Oct. 7, 1850) involved the slower distillation of coals, at a lower temperature than had hitherto been employed for the purpose, and this novelty in practice was followed by the novel result of a copious production of liquid hydrocarbons. The gas or cannel coals were found to yield the liquids in largest quantities, that variety known as Boghead coal or Torbane Hill mineral being specially adapted for the patented process. (See PARAFFIN OIL, *below.*) Soon after Young's discovery native petroleum was brought from Rangoon, and purified by distillation, so as to produce oils very similar to the coal products. During the last few years rich sources of petroleum have been discovered in Canada and the North American States, and at the present vast quantities of the native liquid are imported into this country from those sources. An Act of Parliament was passed in 1862, to prevent the storage, without a licence, of more than 40 gallons of petroleum, or any product thereof that gives off inflammable vapours under 100° Fahr. This Act has not had the effect intended, and it is notorious that petroleum and its products are recklessly stored in large quantities where their accidental ignition would produce terrible effects. It is estimated that 20,000,000 gallons of petroleum, most of it in the crude and therefore dangerous condition, were brought to this country in 1863.

Tests, Precautions. As there is little demand as yet for the more volatile and dangerous constituents of petroleum, unprincipled dealers frequently allow them to remain in the oils sold for burning. In consequence of this criminal recklessness many frightful accidents have taken place, To ascertain the character for safety possessed by any oil is, therefore, a very important matter. The Sanitary Commission of the 'Lancet' took as the limit of safety an oil that gave off inflammable vapour when heated to 130° Fahr., and this has been generally accepted by dealers. If an oil gives off inflammable vapours before being heated up to 130°, it is considered unsafe for domestic use.

1. The plan for testing this, recommended in the 'Lancet,' is to heat a portion of the suspected oil in a gallipot placed in boiling water, ascertaining by a thermometer suspended in the oil the temperature at which it will take fire on the surface when a lighted wax vesta is applied to it. This is a troublesome and dangerous process, and has little practical value.

2. A rough and ready method of testing the inflammability of a sample is to pour a little out on a dry flat board, and try whether it can be ignited readily by a lighted paper. If it catches fire like turpentine or brandy, the oil is dangerous.

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[1] See article ILLUMINATION.

3. The following plan, proposed by Mr. Tegetmeier, requires no scientific knowledge, and no apparatus but what is to be found in every house, while it is sufficiently accurate for all practical purposes:—

Take an earthenware dish, holding about half a pint (a breakfast cup will do), fill the cup full from a kettle of boiling water, pour this into an earthenware quart jug, then fill the same cup again with boiling water from the kettle, and pour it also into the quart jug, then fill the cup with cold water, put it into the jug, shake the jug to mix the hot and cold water, then pour the tepid water from the jug into the cup till the cup is half full, then pour about a table-spoonful of the oil to be tested on the tepid water in the cup, take the oil-can with the oil out of the room, then touch the surface of the oil in the cup with a lighted splinter of wood, or a match without sulphur. If the match causes a flash of flame to appear on the surface of the oil, the oil is below the standard of safety, and should not be used; if no flame appears, the oil is up to the standard. We may mention that in this trial no time should be lost after pouring the boiling water from the kettle, as the water may get too cold, but the whole may be gone through in from two to three minutes. It is well to have a saucer at hand, and if the oil should be a bad oil, and ignite with the match, place the saucer on the mouth of the cup, and the flame is extinguished. This trial should be done by daylight, and at a distance from a fire, and the directions must be followed exactly in the order as given above.

4. Provided that the oils to be examined have been produced by careful fractional distillation, their relative volatility, as indicated by their specific gravity, shows to a great extent the facility with which they ignite. The lightest oils are more volatile and more easily inflamed than those which are heavier. Oils much under ·800 inflame directly a lighted match is thrown into them, whereas oils at about ·815 to ·823 (if unmixed products) cannot be set on fire in this manner. The specific gravity test cannot, however, be depended on to determine the inflaming point of any commercial oil. A heavy oil, badly rectified, may contain a proportion of very volatile vapour, and have a low inflaming-point; whereas a much lighter oil may be perfectly safe, from its having the more volatile portions carefully removed. See PETROLEUM.

To prevent accidents with paraffin or petroleum lamps, the following precautions ought to be observed:—

The lamps should be filled and trimmed by daylight.

They should never be overfilled; the oil should not be allowed to come into contact with the metal work of the burner.

Any portion of oil spilled on the outside of the lamp should be carefully wiped away.

When not in use, the wick should be turned down into the wick-holder.

⁂ The principal products noticed below rank high among the numerous varieties of mineral oil now in the market, but there are doubtless many others equally good and safe. Their properties are described in accordance with the results obtained by Mr. W. B. Tegetmeier, who has devoted much time to the examination of the mineral oils:—

Oil, Al'bertite. From 'Albertite,' a lustrous black mineral found in New Brunswick. A sample was shown in the Colonial Department of the International Exhibition of 1862, but the oil has not yet appeared in the English market.

Prop. Odour very slight; illuminating power high; boiling-point 338° Fahr., or 126° above that of water.

Oil, American. See PETROLEUM OIL (*below*).

Oil, Apyroec'tic. *Syn.* NON-EXPLOSIVE OIL. A burning oil introduced by F. Tall, of Hull, and prepared, we believe, from American petroleum.

Prop. Slightly coloured; perfectly limpid; odour slight, but not perceivable during combustion. The most remarkable property of this oil is that, in spite of its limpidity, the point at which it gives off inflammable vapour is 180° Fahr., or 80° above the requirements of the Petroleum Act.

Oil, Bel'montine. From Rangoon tar, or Burmese petroleum, by distillation; superheated steam being employed as the heating agent.

Prop. Colourless; odour not unpleasant; sp. gr. ·847; but although so heavy, the oil is altogether free from viscosity, and will rise rapidly in a comparatively long wick; inflaming-point 134° Fahr.; burns with an exceedingly white light, and possesses a very high illuminating power.

Obs. The distillation of the Rangoon tar is carried on by Price's Patent Candle Company, under a patent. Besides the above lamp oil, several beautiful and useful products are obtained:—At first there comes over a very volatile liquid, termed SHERWOODOLE, used as a detergent for removing grease from fabrics, cleaning gloves, &c.; then comes the BELMONTINE OIL, already noticed; then two lubricating oils, the one light and the other heavy; and, last of all, when the temperature is considerably elevated, the beautiful white, translucent solid, known as BELMONTINE, distils over. This last is a kind of paraffin, and is used for making ornamental candles.

Oil, Caz'eline. An excellent burning oil, probably prepared from American petroleum, introduced by Cassell, Smith, and Co., of London.

Prop. Bright, limpid, with scarcely a trace of colour; odour very slight, and quite free from any objectionable character; sp. gr. ·805; lowest point of ignition 144° Fahr.; burns with a pure white light, free from smoke and smell.

Oil, Col'zarine. A heavy hydrocarbon oil, adapted for burning in lamps constructed from the old 'Moderators' and 'Carcels,' formerly so much used for the fat oils.

Prop. Limpid; quite inodorous; of a pale amber colour; sp. gr. about ·838; temperature at which the vapour can be permanently ignited, 250° Fahr. Tested in the altered moderator, it gives an intense white light, without smoke or smell. Compared with vegetable colza oil, its illuminating power is in the proportion of 3 to 2.

Obs. This oil is manufactured by Cassell, Smith, and Co., under Martin's patent for the modification of mineral oils, to fit them for burning in lamps where 'colza' and other vegetable and animal oils have been usually consumed. Similar oils are prepared by other firms.

Oil, Machinery. *Syn.* LUBRICATING OIL, SHAFTING O., SPINDLE O. The heavier hydrocarbon oils obtained in distilling coal, shale, and petroleum, have almost superseded the fat oils for lubricating purposes. They have no chemical action on the ordinary metals, and are not affected by cold. The lightest of these comparatively heavy oils are used for spindles of other kinds of rapid machinery; the heaviest for the bearing parts of heavy machinery; and those of an intermediate character for such things as printing-presses, agricultural steam-engines, &c. The firm of Whitmore and Craddock is favourably known for the manufacture and purification of these machinery oils. See BURNING OIL (above), and PARAFFIN OIL (below).

Oil, Paraffin. *Syn.* PARAFFINE OIL. This name was given by Mr. Young to the oil produced by the distillation of [illegible] coal, Boghead coal, &c., at a temperature considerably lower than that employed in the manufacture of illuminating gas. This product is [illegible] most important of the mineral oils, [illegible] account of its manufacture will be [illegible] [illegible]. The following [illegible] process adopted at the great paraffin works at Bathgate, [illegible]:—

[illegible] Young's patent. [illegible] broken into small fragments [illegible] perpendicular tubes [illegible] [illegible] [illegible] water, which [illegible] there may be [illegible] by special valves. The coal in each tube is gradually heated as it descends [illegible] that part which passes through the furnace, and when it reaches the bottom of the tube it has parted with its volatile constituents, and is raked away, as fresh coal from above descends as it is removed. Thus, the action of these perpendicular retorts is continuous, and the distillation goes on uninterruptedly both day and night. The vapours produced are conducted by iron tubes to the main condensers, which consist of a series of syphon pipes freely exposed to the air. The quantity of incondensible gas formed is inconsiderable; and it is this result, so different from that obtained in the ordinary gas-works, that marks the great value of Young's process. The crude oil, a dark-coloured, thick liquid, is then distilled to dryness in large iron cylindrical stills, and is thus freed from the excess of carbon which is left behind as coke. The oil, after distillation, is further purified by being acted upon by strong sulphuric acid (oil of vitriol), which chars the principal impurities, and causes them to subside in the form of a dense black, heavy acid tar. To separate the remaining impurities, and that portion of the sulphuric acid which remains in the oil, it is next subjected to the action of caustic soda. As thus purified, the paraffin oil contains four distinct commercial products. To effect their separation, the process of fractional distillation is first employed. The first elevation of temperature drives over the lighter and more volatile portions, which, when purified by a subsequent distillation, yields the fluid known as 'paraffin naphtha.' This product is used as a substitute for 'turps' as a solvent for India rubber, and for burning in those naphtha lamps so much employed by costermongers, and workmen in railway tunnels and similar situations. On the perfect separation of this naphtha the safety of the burning oil depends. This burning oil, the 'paraffin oil' of commerce, comes over at a much higher temperature than the naphtha. It is a perfectly safe lamp oil, and has a greater illuminating value than any other oil in the market. Its properties are noticed below. The third product in point of volatility is a comparatively heavy liquid (machinery oil), largely used for lubricating purposes in the [illegible] factories. From this oil and others [illegible] over at a very high temperature, the fourth commercial product is separated by [illegible]. This last product is the beautiful translucent solid, paraffin, [illegible] as a candle material. (See [illegible].)

[illegible] The paraffin oil of commerce is of [illegible] is bright, perfectly [illegible] and remarkably limpid. Its [illegible] ·82 [illegible] Its point of temporary ignition [illegible] permanent ignition [illegible] Its odour is very [illegible] is slow, as may [illegible] the absence of the lighter [illegible] as indicated by its high sp. gr. and [illegible] At the same time, its limpidity [illegible] the absence of the heavier oils, and

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[illegible] account of the processes carried on at the Bathgate works see Mr. [illegible] paper in [illegible] accounts for it rising through a long wick with freedom, and burning without charring the cotton.

Oil, Petro'leum. *Syn.* KEROSENE OIL, REFINED PETROLEUM. Many of the burning oils now in the market are derived from American petroleum. The native petroleums vary greatly in properties, and numerous methods of refining are employed by the manufacturers. Some make use of both acids and alkalies, others employ alkalies alone, and steam is applied at various degrees of heat. Some of the oils produced are of excellent quality, but others are inferior, and do not ascend the wick in sufficient quantity to afford a constant light. None of the native petroleums contain carbolic acid and other impurities which exist in the oils distilled from coals and shales; hence their purification is simple and comparatively cheap. See PETROLEUM, and *above*.

Oil, Shale. Products analogous to those derived from cannel or Boghead coal are obtained by the destructive distillation of bituminous shales and schists, and lignites or brown coals. On the Continent shale oils have for some time been manufactured on a large scale.

OILS (Mixed). *Syn.* COMPOUND OILS; OLEA COMPOSITA, OLEA MIXTA, L. Under these names are commonly included various mixtures of oils and other substances that possess an unctuous appearance. When not otherwise stated, they are prepared by simply agitating the ingredients together, and, after a sufficient time, decanting the clear portion, which, in some cases, is then filtered. A few of them only possess any importance. Some of them are highly esteemed as remedies among the vulgar, and the use of others is confined to veterinary medicine.

The following include the principal mixed oils of the shops, to which the names of a few other compounds, which are frequently called '*oils*' by the ignorant, are added, for the purpose of facilitating a reference to them:—

Acou'stic Oil. *Syn.* EAR OIL; OLEUM ACOUSTICUM, O. TEREBINTHINÆ ACOUSTICUM, L. *Prep.* From oil of turpentine, 1 part; oil of almonds, 6 parts; mix. In atonic deafness, accompanied with induration of the wax. 1 or 2 drops are poured into the ear, or on a piece of cotton wool, which is then gently placed in it.

Black Oil. *Syn.* OLEUM NIGRUM, L. *Prep.* 1. Oil of turpentine, 1 pint; rape oil, 3 pints; oil of vitriol, ¼ lb.; agitate well together with care; then add of Barbadoes tar, 3 oz.; again agitate well, and in 10 days decant the clear portion. Linseed oil is preferred for the above by many persons.

2. (Percivall.) Sweet oil, 1 pint; oil of turpentine, 2 oz.; mix, add gradually of oil of vitriol, 1¼ oz., again mix, and leave the bottle open until the next day. Detersive, stimulant. *Used* by farriers for mange, &c.

British Oil. *Syn.* COMMON OIL OF PETRE; OLEUM BRITANNICUM, O. PETRÆ VULGARE, L. *Prep.* From oil of turpentine, 1 quart; Barbadoes tar, 1 lb.; oils of rosemary and origanum, of each, 1 oz. Stimulant. Formerly reputed to possess the most astonishing virtues.

Camphora'ted Oil. Liniment of camphor.

Car'ron Oil. Liniment of lime.

Chabert's Oil. *Syn.* CHABERT'S EMPYREUMATIC OIL; OLEUM CHABERTI, O. CONTRA TÆNIAM CHABERTI, L. Oil of turpentine, 3 parts; Dippel's animal oil, 1 part; mix, and distil 3 parts. It must be preserved from the air and light. *Used* in tapeworm.—*Dose.* 1 to 2 teaspoonfuls, in water, night and morning, until 5 or 6 fl. oz., or more, have been taken; a cathartic being given every third day.

Fur'niture Oil. *Syn.* MAHOGANY OIL, OIL STAIN. *Prep.* 1. From refined linseed oil, 1 pint; alkanet root, ¼ oz.; digested together in a warm place until the former is sufficiently coloured, when it is poured off and strained.

2. Pale boiled oil, 1 pint; bees' wax, ¼ lb.; melted together, and coloured as before. Gives a superior polish, which becomes very tough by age.

3. Linseed or boiled oil, 1 pint; Venice turpentine (pure), 6 oz.; as before. The above are used for mahogany and other dark-coloured woods.

4. (Pale.)—*a.* As the preceding, omitting the alkanet.

b. From nut oil, ¾ pint; bees' wax (finest), 3 oz.; melted together.

c. To the last, add of copal varnish, 3 or 4 oz.

The last three are employed for pale woods. They are all applied by means of a rag, and are 'polished off' with a 'woollen rubber' or 'furniture brush.' A little strong vinegar, or a few drops of hydrochloric acid, are sometimes added. See POLISH.

Hair Oil. See OIL (Perfumed).

Oil and Hartshorn. Liniment of ammonia.

I'ron Oil. *Syn.* OLEUM FERRI, O. MARTIS, L. The old name for the liquid formed when perchloride of iron is allowed to deliquesce by free exposure to the air. It is excessively caustic and corrosive.

Lime Oil. See CALCIUM (Chloride).

Macas'sar Oil. See OILS (Perfumed).

Mar'row Oil. *Prep.* From clarified beef-marrow, 1 part; oil of almonds, 3 parts; melted together, and strained through muslin. It is usually scented with ambergris, cassia, or mace, and slightly tinged with palm oil or annotta. *Used* for the hair.

Marshall's Oils. *Prep.* From linseed oil and rape oil, of each, 1 lb.; green oil and oil of turpentine, of each, ½ lb.; oil of origanum, ½ fl. oz.; oil of vitriol, ¼ oz.; well shaken together.

Mixed Oils. *Syn.* OLEUM MIXTUM COMMUNE, L. *Prep.* From linseed oil and green oil, of each, 1 lb.; oil of turpentine, ½ lb.; Barbadoes tar and balsam of sulphur, of each, 2 oz.; oils of spike and origanum, of each, 1 oz. Stimulant and rubefacient. *Used* by farriers for sprains, &c. See STAMFORD'S OILS (*below*).

Newmarket Oils. *Prep.* From oils of linseed, turpentine, and St. John's wort, of each, 3 lbs.; oil of vitriol, 1½ oz.; well shaken together, and the clear portion decanted in a few days. A favourite remedy for sprains in horses.

Nine Oils. *Syn.* OLD MIXED OILS; OLEUM EX OMNIBUS, L. *Prep.* From train oil, 1 gall.; oil of turpentine, 1 quart; oil of amber and oil of bricks, of each, 5 oz.; oil of spike and oil of origanum, of each, 2 oz.; Barbadoes tar, 2½ lbs.; oil of vitrol, 2 oz.; camphorated spirit, ½ pint, mixed together as the last. A favourite remedy with provincial farriers.

Oil of Petre. See BRITISH OIL (*above*).

Phos'phorated Oil. *Syn.* OLEUM PHOSPHORATUM, L. *Prep.* 1. (Ph. Bor.) Phosphorus (dried and sliced small), 6 grs.; oil of almonds, 1 oz; mix, place the phial in hot water, agitate for some time, and, when cold, decant the clear oil from the undissolved phosphorus.

2. (Magendie.) Phosphorus (sliced), ½ dr.; almond oil, 1 oz.; macerate in the dark, with frequent agitation, for 14 days, then, after repose, decant the clear portion, and aromatise it with a little essence of bergamotte.

Obs. A fl. oz. of oil dissolves rather less than 5 grs. of pure phosphorus. The large excess ordered in the second formula must be merely for the purpose of increasing the extent of surface acted on. It is, however, with the other precautions given, quite unnecessary. The products of both formulæ have the same strength.—*Dose.* 5 to 10 or 12 drops, in milk, barley water, or gruel, or made into an emulsion; in chronic rheumatism, gout, &c., and as a powerful, diffusible stimulant in various diseases with debility and general prostration of the vital powers, &c. Externally, as a friction. It is chiefly to the presence of phosphorus that cod-liver owes its wonderful remedial power in these affections.

Quit'ter Oil. *Prep.* 1. Red precipitate, 2 drs.; aquafortis, 1 oz; dissolve, add of olive oil, oil of turpentine, and rectified spirit, of each, 2 oz.; and agitate well and frequently for 3 or 4 hours.

2. Ointment of nitrate of mercury (Ph. L.), 1 part; nut oil, 3 parts; melt together, and stir until the mixture is cold. *Used* by farriers for quitters, &c.

Radley's Oils. From Barbadoes tar, ½ lb.; linseed oil and oil of turpentine, of each, ½ pint; gently warmed, and shaken together.

Shav'ing Oil. See ESSENCE OF SOAP.

Sheldrake's Oil. *Prep.* From pale boiled nut oil and copal varnish, equal parts, melted together by the heat of hot water, and, when perfectly mixed, placed aside in a bottle for a week to settle, after which the clear portion is decanted. *Used* by artists to grind their colours in, to brighten them.

Oil of Spike. 1. (FARRIER'S.) From oil of turpentine, 1 quart; Barbadoes tar, 1½ oz.; alkanet root, ½ oz.; digested together for a week. *Used* as a stimulating liniment by farriers.

2. (PAINTER'S.)—*a.* From rectified oil of turpentine, 3 pints; oil of lavender, 1 pint; mix.

b. Oil of turpentine (warm), 5 parts; lavender oil bottoms (genuine), 3 parts; agitate well together, and in a fortnight decant the clear away. *Used* by artists and enamellers.

Stamford's Oils. *Syn.* LORD STAMFORD'S MIXED OILS. *Prep.* Dissolve camphor, 1 oz., in rectified spirit of wine, ¼ pint; add, oil of origanum, 2 oz.; oil of turpentine, ½ pint; green elder oil, 2 lbs.; and agitate until mixed. The rectified spirit is now generally omitted, the camphor being dissolved in the green oil by aid of heat before adding the other ingredients. Stimulant. *Used* by farriers.

Sul'phurated Oil. *Syn.* BALSAM OF SULPHUR; OLEUM SULPHURATUM, BALSAMUM SULPHURIS, L. *Prep.* 1. (Ph. L. 1746.) Flowers of sulphur, 1 part; olive oil, 4 parts; boil together in a vessel lightly covered, until they assume the consistence of a thick balsam.

2. (Ph. L. 1824.) Olive oil, 16 fl. oz.; heat it in a sand bath, and gradually add of washed sulphur, 2 oz.; stirring until they combine.

Prop., &c. Balsam of sulphur is a dark, reddish-brown, viscid fluid, having an extremely disagreeable and penetrating odour, and a strong, nauseous taste. The local action of balsam of sulphur is that of an acrid and irritant; its remote effects, those of a stimulant, expectorant, and diaphoretic. Externally, it is occasionally used as an application to foul ulcers; and was formerly commonly employed internally, in chronic pulmonary affections, in doses of 20 to 50 drops. It is now seldom given internally, except in veterinary practice.

Three Oils. *Syn.* OLEUM DE TRIBUS (Van Mons), L. Oils of brick, lavender, and turpentine, equal parts. As a stimulant liniment.

Oil of Vit'riol. Sulphuric acid.

Ward's Oils. *Syn.* WARD'S WHITE OILS. From powdered camphor, rape oil, oil of turpentine, rectified spirit, and liquor of potassa, equal parts, agitated together for some time, and again before use. Beef brine was formerly used instead of liquor of potassa.

Watchmaker's Oil. Prepared by placing a clean strip or coil of lead in a small white-glass bottle filled with pure almond or olive oil, and exposing it to the sun's rays at a window for some time, till a curdy matter ceases to be deposited, and the oil has become quite limpid and colourless. *Used* for fine work; does not become thick by age.

Wedell's Oil. *Syn.* BEZOAR OIL; OLEUM BEZOARDICUM, L. From nut oil, ½ pint; camphor, ½ oz.; dissolve by a gentle heat, and when cold, add of essence of bergamot, 1 dr., and let it stand over a little alkanet root, until sufficiently coloured.

White Oils. *Syn.* WHITE EGG-OILS. *Prep.* 1. Yolks of eggs, 4 in number; oil of turpentine, ¼ pint; mix, add of liquor of ammonia, 3 fl. oz.; oil of origanum, ½ oz.; soaper's lye, ¼ pint; water, ¾ pint; agitate well, and strain through a coarse hair sieve.

2. Rape oil, ¾ pint; liquor of ammonia and oil of turpentine, of each, 3 oz.; agitate until they form a milk.

3. (Redwood.) Whites and yolks of 2 eggs; oil of turpentine, 1½ oz.; triturate together, add of Goulard's extract, ½ oz., mix, next add of distilled vinegar, 1½ pint, and, lastly, of rectified spirit, 1½ fl. oz. Stimulant and detergent. *Used* by farriers.

Worm Oil (Canine). *Syn.* OLEUM VERMIFUGUM CANINUM. *Prep.* From oil of turpentine and castor oil, equal parts; tinged yellow with a little palm oil or annotta.—*Dose.* For a middle-sized dog, ½ oz., repeated in 2 or 3 hours if it does not operate.

OILS (in Perfumery). *Syn.* SCENTED OILS; OLEA FIXA ODORATA, L. The oils which usually form the basis of these articles are those of almonds, ben, or olives; but others are occasionally used. The methods adopted for their preparation vary with the nature of the substances whose fragrance it is intended to convey to the oil. The Continental perfumers employ three different processes for this purpose, which they technically distinguish by terms indicative of their nature. These are as under:—

1. A sufficient quantity of the essential oil of the plant, or of the concentrated essence of the substance, if it does not furnish an oil, is added to the fixed oil which it is desired to perfume, until the latter becomes agreeably fragrant; the whole is then allowed to repose for a few days, and, if any sediment falls (which should not be the case when the ingredients are pure), the clear portion is decanted into another bottle. When alcoholic essences are thus employed, the fixed oil should be gently warmed, and the admixture made in a strong bottle, so as to permit of it being corked and well agitated with safety; and in this case the agitation should be prolonged until the whole has become quite cold. In this way, all the ordinary aromatised and perfumed oils of the English druggists and perfumers, as those of bergamotte, cassia, cloves, lavender, lemon, mille-fleurs, neroli, nutmeg, oranges, roses, &c., are made; but those of a few of the more delicate flowers, and of certain other substances, can only be prepared of the first quality by one or other of the processes described below.

In general, 1 to 1½ dr. of the pure essential oils, or 3 to 4 fl. drs. of the alcoholic essences, are found sufficient to render 1 pint of oil agreeably fragrant. ½ dr. of pure attar of roses is, however, enough for this purpose, owing to the very powerful character of its perfume; but even a less quantity than this is commonly employed, on account of its costliness, the deficiency being made up by a mixture of the oils of rhodium, rosemary, and bergamotte. Most of the oils of this class are intended for hair cosmetics.

2. (By INFUSION.) Dry substances, after being reduced to powder, or sliced very small —flowers or petals, after being carefully selected, and picked from the stems and other scentless portions—and soft or unctuous matters, as ambergris, civet, or musk, after being rubbed to a paste with a little oil, either with or without the addition of about twice their weight of clean sand or powdered glass, to facilitate the reduction, are digested in the fixed oil for about 1 hour, at a gentle heat obtained by means of a water bath, continual stirring being employed all the time; the mixture is then removed from the heat, covered up, and left to settle until the next day, when the clear portion is decanted into clean bottles. When flowers are employed, the free oil is drained off, and the remainder obtained by the action of a press. The process is then repeated with fresh flowers, 5 or 6 times, or even oftener, until the oil is sufficiently perfumed. For ambergris, musk, or civet, the digestion is generally continued for 15 to 20 days, during which time the vessel is either freely exposed to the sunshine, or kept in an equally warm situation.

The first quality of the oils of ambergris, balsam of Peru, benzoin, cassia, cinnamon, civet, orange-flowers, orris, roses, styrax, and vanilla, are made by infusion.

3. (By THE FLOWERS.)—*a.* Upon an iron frame a piece of white, spongy, cotton cloth is stretched, and then moistened with almond or olive oil, usually the latter; on the cloth is placed a thin layer of the fresh-plucked flowers; another frame is similarly treated, and in this way a pile of them is made. In 24 or 30 hours the flowers are replaced by fresh ones, and this is repeated every day or every other day, until 7 or 8 different lots of flowers have been consumed, or the oil is sufficiently loaded with their odour. The oil is then obtained from the cotton cloth by powerful pressure, and is placed aside in bottles to settle, ready to be decanted into others for sale. Sometimes thin layers of cotton wool, slightly moistened with oil, are employed instead of cotton cloth.

The oils of honeysuckle, jasmin, or jessamine, jonquil, may-blossom, myrtle-blossom, narcissus, tuberose, violet, and, in general, of all the more delicate flowers, are prepared in the above manner.

b. The native perfumers of India prepare their scented oils of bela, chumbul, jasmin, &c., in the following manner:—A layer of the scented flowers, about 4 inches thick and 2 feet square, is formed on the ground; over this is placed a layer of moistened tel or sesamum seeds, 2 inches thick, and on this another 4-inch layer of flowers. Over the whole a sheet is thrown, which is kept pressed down by weights attached round the edges. The flowers are replaced with fresh ones after the lapse of 24 hours, and the process is repeated a third and even a fourth time, when a very highly scented oil is desired. The swollen sesamum seeds, rendered fragrant by contact with the flowers, are then submitted to the action of the press, by which their bland oil is obtained strongly impregnated with the aroma of the flowers. The expressed oil is then set aside in dubbers (bottles made of untanned hides) to settle. We have employed poppy seed in this country, in a similar manner, with great success.

c. The flowers are crushed in a mortar or mill, with one half their weight of blanched sweet almonds, and the next day the mass is gently heated and submitted to the action of a powerful press; the liquid thus obtained is allowed to repose for a week, when the upper portion of oil is decanted and filtered. This plan is occasionally adopted in this country for the oils of roses, and of a few other flowers. (See *below.*)

The solution of a few grains of benzoic acid, or of gum benzoin (preferably the first), in any of the above oils, will materially retard the accession of rancidity, if it does not prevent it altogether.

The oils of the last two classes (2 and 3) are chiefly used to impart their respective odours to the simple oils, pommades, &c.; and in the manufacture of scented spirits or esprits. The following formulæ are given as examples of both classes of preparations:—

Oil of Am′bergris. From ambergris, 2 drs.; oil, 1 pint; by infusion.

Oil of Ben′zoin. From gum benzoin, 7 drs.; oil, 1 pint; by infusion.

Oils for the Hair. *Syn.* HUILES ANTIQUES, Fr. These are numerous. All those scented with the simple perfumes are prepared in the way explained under class 1 (*above*). The selection depends entirely upon the judgment of the operator or the fancy of the purchaser. In general, a mixture of two or three perfumes is preferred in these countries to the pure fragrance of any single flower, and a grossness of taste is exhibited in these matters which surprises our Continental neighbours, and the inhabitants of Italy more particularly. Some of these oils are coloured. A red tinge is given to them by allowing the oil to stand for a few hours over a little alkanet root (2 drs. to the pint) before scenting it. The application of a gentle heat facilitates the process. Yellow and orange are given by a little annotta or palm oil; and green, by steeping a little green parsley or lavender in them for a few days; or by dissolving 2 or 3 drs. of gum guaiacum in each pint by the aid of heat, and, when cold, decanting the clear portion. Huile antique au jasmin, Huile antique à la fleurs d'oranges, Huile antique à la rose, Huile antique à la tuberose, huile antique à la violette, &c., are simple oils flavoured with the respective perfumes or their preparations.—Huile antique rouge à la rose is the ordinary oil of roses coloured with alkanet root.—Huile antique verte is simple oil coloured green, as above, and scented.—Huile antique aux mille-fleurs is so scented with several perfumes that none predominate. A mixture of bergamotte, lemons, lavender, neroli, pimento, and ambergris or musk, is commonly employed for the purpose.

Macas′sar Oil. *Syn.* HUILE DE MACASSAR. *Prep.* 1. (Rowland's.) Oil of ben or almonds (reddened by alkanet root), 1 pint; oils of rosemary and origanum (white), of each, 1 dr.; oil of nutmeg and attar of roses, of each, 15 drops; neroli, 6 drops; essence of musk, 3 or 4 drops.

2. (De Naquet.) Oil of ben, 1 quart; nut oil, 1 pint; rectified spirit, ¼ pint; essence of bergamotte, 3½ drs.; tincture of musk and esprit de Portugal, of each, 2 drs.; otto of roses, ½ dr.; alkanet root, q. s. to colour.

Mar′row Oil (Perfumed). 1. Simple marrow oil, scented at will.

2. (FLUIDE DE JAVA.) Marrow oil, coloured with a little palm oil, and scented.

3. (HUILE COMOGENE.) Marrow oil, 4 oz.; spirit of rosemary, 1½ oz.; oil of nutmeg, 12 drops.

4. (HUILE PHILOCOME D'AUBRIL.) Cold-drawn nut oil and marrow oil, equal parts; scent, at will, q. s.

5. (HUILE DE PHÉNIX.) Clarified beef marrow, lard, pale nut oil, and expressed oil of mace, of each, 4 oz.; melt together by the heat of hot water, strain through linen into a warm stone mortar, add, of oils of cloves, lavender, mint, rosemary, sage, and thyme, of each, ½ dr.; rectified spirit, 1 oz., in which has been dissolved by a gentle heat balsam of tolu, 4 drs.; camphor, 1 dr.; triturate until the whole is cold, and then put it into bottles. All the above are used to make the hair grow, and to prevent it falling off.

Oil of Musk. From grain musk, 1 dr.; ambergris, ½ dr.; oil of lavender, 20 drops; oil, 1 pint, by infusion. A second quality is made by working the same ingredients, after the oil is poured from them, with ¾ pint of fresh oil. This also applies to OIL OF AMBERGRIS and HUILE ROYALE.

Oil of Musk and Am′bergris. *Syn.* HUILE ROYALE. From ambergris, 2 drs.; grain musk, ½ dr.; oils of cassia, lavender, neroli, and nutmeg, of each, 10 drops; oil, 1 pint; by infusion. (See *above.*)

Oil of Sty′rax. From liquid styrax (pure), 5 drs.; oil of nutmeg, 10 drops; ambergris, 6 grs.; oil, 1 pint; by infusion.

Oil of Vanil′la. *Syn.* HUILE À LA VANILLE. From purest olive or almond oil, 1½ pint; vanilla (finest, in powder), 2 oz.; oil of bergamotte, 1 dr.; attar of roses (finest), 15 drops; by infusion.

OILS (Volatile). *Syn.* OLEA DESTILLATA, OLEA DISTILLATA, OLEA ESSENTIALIA, OLEA VOLATILIA, L.; HUILES VOLATILES, Fr. The volatile oils are an extensive and important class of bodies, derived from the vegetable kingdom, and found in almost every part of the majority of the plants which produce them, except the cotyledons of the seeds, in which, in general, the fixed oils are exclusively stored up. Their presence confers upon flowers, leaves, fruit, seeds, roots, bark, and woods, their peculiar and characteristic odours; but among these they are not equally distributed in the same individual, and are often altogether absent from some of them. To them we are indebted for our most delightful perfumes, and our choicest spices and aromatics. Some of them are found to possess valuable medicinal properties, and others are invested with the highest possible interest on account of their peculiar chemical constitution, and the reactions which occur when they are brought into contact with other bodies.

The volatile oils are often called 'essences,' and the same loose and unmeaning term is also commonly applied to their alcoholic solutions.

Prop. The volatile or essential oils are usually more limpid and less unctuous than the fixed oils; but some of them are butyraceous or crystalline. Nearly all of them consist of two or more oils, differing in their sp. gr. and boiling-points, one of which is generally liquid, the other, in some cases, crystalline. All of them, when perfectly pure, are colourless, though before rectification nearly the whole of them have a pale yellow tint, and some of them are brown, blue, or green. Their odour is that of the plants which yield them, and is usually powerful; their taste is pungent and burning. They mix in all proportions with the fixed oils, dissolve freely in both alcohol and ether, and are sparingly soluble in water, forming 'perfumed' or 'medicated waters.' Their boiling-point usually ranges between 310° and 325° Fahr., and is always considerably higher than that of water. They resist saponification, and (excepting oil of cloves) do not combine with the salifiable bases. Their density fluctuates a little on either side of water. The lightest oil is that of citrons (sp. gr. ·847), and the heaviest that of sassafras (sp. gr. 1·096.) When cooled sufficiently, they all solidify. The common temperature of the atmosphere is sufficient for this with some of them, as the oils of roses and aniseed; whilst others require to be cooled below the freezing-point of water, before they assume the solid form. In this state they appear to consist of a crystalline or semi-crystalline substance (stearopten, stearessence), and a fluid portion (eleopten, oleiessence). The two may be separated by pressing the concrete oil between the folds of bibulous paper, in the cold. By exposure to the air, the volatile oils rapidly absorb oxygen, and become partially converted into resin. This is the cause of the deposit that usually forms in them (especially in the expressed oil of orange) when kept in an ill-corked vessel. The solid crystalline matter which separates from them when kept in closed vessels is stearoptene.

Class. Chemically considered, the essential oils may be divided into three great classes:—

1. Oils composed of carbon and hydrogen only (binary volatile oils, carbo-hydrogens, hydro-carbons, terebenes, camphenes), of which oil of turpentine may be regarded as the type. These are characterised by being, as a class, less soluble in rectified spirit and in water than the other essential oils. The oils of bergamot, capivi, cubebs, elemi, hops, juniper, lemons, orange peel, pepper, the grass oil of India, the laurel oil of Guiana, and some others, belong to this class.

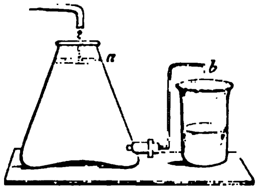
2. Oils containing carbon, hydrogen, and oxygen (oxygenated oils), including most of those used in medicine and perfumery. These, as a class, are more soluble in rectified spirit and in water than those containing carbon and hydrogen only. To this class belong the oils of almonds, aniseed, cassia, cedar-wood, cinnamon, cumin, jasmin, lavender, meadow-sweet (*Spiræa ulmaria*), orange flowers, penny-royal, peppermint, spearmint, rosemary, rose-petals, valerian, winter green (*Gaultheria procumbens*), and others too numerous to mention. A few of these oxygenated oils contain nitrogen.

3. Oils containing sulphur (sulphuretted oils). These are characterised by their extreme pungency, suffocating odour, vesicating power, property of blacking silver, and being decomposed by contact with most other metallic bodies. The oils of assafœtida, black mustard seed, garlic, horseradish, and onions, are of this kind. Some sulphuretted oils contain nitrogen.

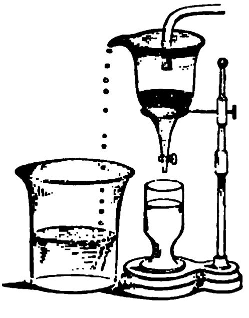
Prep. The volatile oils are generally procured by distilling the odoriferous substances along with water; but in a few instances they are obtained by expression, and still more rarely by the action of alcohol.

According to the common method of proceeding, substances which part freely with their oil are put into the still along with about an equal weight of water, and are at once submitted to distillation. Those substances which give out their oil with difficulty are first soaked for 24 hours, or longer, in about twice their weight of water, to each gallon of which 1 lb. of common salt has been added, in order to raise its boiling-point. The distillation is conducted as quickly as possible, and, when one half the water has come over, it is returned into the still, and this cohobation is repeated, when necessary, until the distilled water ceases to be mixed with oil. The heat of steam or a salt-water bath should be preferably employed. When a naked fire is used, the still should be deep and narrow, by which means the bottom will be better protected by the gradually decreasing quantity of water towards the end of the process, and empyreuma prevented. When the distilled water is to be repeatedly cohobated on the ingredients, a convenient and economical plan is to so arrange the apparatus that, after the water has separated from the oil in the receiver, it shall flow back again into the still. An ordinary worm-tub, or other like condensing apparatus, may be employed; but in the case of those oils which readily solidify, the temperature of the water in the condenser must not fall below about 55° Fahr.

The mixed vapours which pass over condense and fall as a milky looking liquid into the receiver. This separates after a time into two portions, one of which is a solution of a part of the newly eliminated oil in water, and the other is the oil itself. The latter either occupies the upper or the lower portion of the receiver, according as its specific gravity is less or greater than that of distilled water. The separation of the oil and water is effected by allowing the mixed liquids to drop into a 'Florentine receiver' (see *engr.*) when the oil is the lighter of the two, by which means the latter accumulates at *a*, and the water flows over by the spout *b*.



The same receiver may be employed for oils heavier than water, by reversing the arrangement; but a glass 'separator' (see *engr.*) is, in general, found more convenient. In this case the oil accumulates at the bottom of the vessel, and may be drawn off by the stop-cock provided for the purpose.



The essential oils of lemons and oranges of commerce, and of some other fruits, are chiefly obtained by submitting the yellow rind to powerful pressure; but in this way they are not so white, nor do they keep so well, as when distilled, although in the case of the fruits referred to the oils are more fragrant than when prepared by any other method.

The London College excluded the usual directions for the preparation of the essential oils from their Pharmacopœia of 1851, on the ground that these substances are seldom prepared by the druggist or apothecary, or at all on the small scale.

"The fruit of anise, caraway, and juniper, the flowers of chamomile, lavender, and elder, the berries of allspice, the tops of rosemary, and the entire recent plants of the other herbs, are to be employed." "Put any one of these into an alembic, then pour in as much water as will cover it, and distil the oil into a large vessel, kept cool." (Ph. L. 1836.)

The Edinburgh College directs—"As much water only is to be employed as will prevent empyreuma during the distillation. The distillation may be immediately commenced after a proper maceration, and the oil afterwards separated from the water," in the manner already noticed.

"It is also necessary to observe, in preparing these oils, as well as the distilled waters, that the quality of the substances, their texture, the season of the year, and similar circumstances, must occasion so many differences, that it is scarcely possible to give any certain and general rules which shall strictly apply to every example. Many things, therefore, must be regulated by the judgment of the operator."

The Dublin College directs the vegetable substances to be macerated in the still with about 5 times their weight of water, for 24 hours, when one half of the water is to be drawn over. The oil having been separated from this in the usual manner, it is to be returned to the still, and the same quantity drawn over, as before, from which the oil must again be separated.

Chevallier gives the following rules for the distillation of essential oils:—

1. Operate upon as large quantities as possible, in order to obtain a greater product, and one of finer quality.
2. Conduct the distillation rapidly.
3. Divide the substances minutely, in order to facilitate the extrication of the oil.
4. Employ only sufficient water to prevent the matter operated on from burning, and the product from being contaminated with empyreuma.
5. For substances whose oil is heavier than water, saturate or nearly saturate the water in the still with common salt, to raise the boiling-point, and thus to enable the vapour to carry over more oil.
6. Employ, when possible, water which has been already distilled from off the same substances, and has thus become saturated with oil.

7. For oils naturally fluid, keep the water in the refrigeratory cool; but for those oils which easily become solid, preserve it at 80° to 90° Fahr. (?)

To the above may be added:—

8. Collect the oil as soon as possible after it separates from the water with which it passes over, and in its subsequent treatment keep it, as much as possible, from free contact with the air.

Dr. Ure remarks, "The narrower and taller the alembic is, within certain limits, the greater will be the proportion of oil, relative to that of the aromatic water, from like proportions of aqueous and vegetable matter employed." "Some place the plants in baskets, and suspend these immediately over the bottom of the still, under the water, or above its surface in the steam; but the best mode, in my opinion, is to stuff an upright cylinder full of the plants and to drive down through them steam of any desired force, its tension and its temperature being further regulated by the size of the outlet-orifice leading to the condenser. The cylinder should be made of strong copper, tinned inside, and encased in the worst conducting species of wood, such as soft deal or sycamore."

The newly distilled oils may be separated from adhering water, which frequently renders them partially opaque or 'cloudy,' by repose in a temperature between 60° and 70° Fahr., and subsequent decantation; but to render them quite dry (anhydrous), it is necessary to let them stand over some fragments of fused chloride of calcium. This is not, however, required with the commercial oils.

The rectification of the volatile oils is commonly performed without water, by the careful application of a heat just sufficient to make them flow over pretty rapidly, so that they may be kept heated for as short a time as possible. One half, or at most two thirds only, is drawn off, that left in the retort being usually mixed with raw oil intended to be sold in that state. This method often leads to much loss and disappointment, and we have known more than one rather dangerous explosion result from its use. A better plan is to rectify the oil from strong brine, and then to separate any adhering water, either by repose or chloride of calcium.

Pres. Volatile oils should be preserved in well-closed and nearly full bottles, in the shade, and should be opened as seldom as possible. By age they darken, lose much of their odour, increase in density, and become thick and clammy. It is then necessary to distil them, by which the undecomposed portion is separated from the resin. Agitation along with animal charcoal will restore their clearness and original colour, but nothing more.

Pur., Tests. The essential or volatile oils of commerce are very frequently adulterated with the fatty oils, resins, spermaceti, or alcohol, or with other essential oils of a cheaper kind or lower grade. The presence of the first three of these may be readily detected by placing a drop of the suspected oil on a piece of white paper, and exposing it for a short time to heat. If the oil is pure, it will entirely evaporate; but if adulterated with one of these substances, a greasy or translucent stain will be left on the paper. These substances also remain undissolved when the oil is agitated with thrice its volume of rectified spirit.

The presence of alcohol may be detected by agitating the oil with a few small pieces of dried chloride of calcium. These remain unaltered in a pure essential oil, but dissolve in one containing alcohol, and the resulting solution separates, forming a distinct stratum at the bottom of the vessel. When only a very little alcohol is present, the pieces merely change their form, and exhibit the action of the solvent on their angles or edges, which become more or less obtuse or rounded.

Another test for alcohol in the essential oils is the milkiness occasioned by agitating them with a little water, as well as the loss of volume of the oil when it separates after repose for a short time.

A more delicate test of alcohol in the essential oils than either of the preceding is potassium, as employed by M. Beral:—12 drops of the oil are placed on a perfectly dry watch-glass, and a piece of potassium, about the size of an ordinary pin's head, set in the middle of it. If the small fragment of metal retains its integrity for 12 or 15 minutes, no alcohol is present; but if it disappears after the lapse of 5 minutes, the oil contains at least 4% of alcohol; and if it disappears in less than 1 minute, it contains not less than 25% of alcohol.

This species of adulteration is very common, as it is a general practice of the druggists to add a little of the strongest rectified spirit to their oils, to render them transparent, especially in cold weather. Oil of cassia is nearly always treated in this way.

The admixture of an inferior essential oil with one more costly may be best detected by pouring a drop or two on a piece of porous paper or cloth, and shaking it in the air, when, if occasionally smelled, the difference of the odour at the beginning and the end of the evaporation will show the adulteration, especially if the added substance is turpentine. The presence of the latter may also be detected by agitating the oil with rectified spirit, when it will remain undissolved.

The purity of essential oils may likewise, in many cases, be determined by taking their sp. gr.; or, with still greater accuracy and convenience, by measuring their index of refraction, as suggested by Dr. Wollaston. A single drop of oil is sufficient for the application of the last method.

The adulteration of a heavy oil with a light one, or the reverse, may be detected by agitating the suspected oil with water, when, in most cases, the two will separate and form distinct strata.

Uses, &c. The volatile oils are chiefly used by perfumers and rectifiers, and in medicine. Some of the cheaper kinds are largely employed as vehicles for colours, and in the manufacture of varnishes. The dose of the aromatic and carminative oils is from 1 to 10 drops, on sugar, or dissolved in a little weak spirit. This does not apply to oil of bitter almonds, the dose of which is ¼ to ½ a drop.

⁂ The following list includes short notices of nearly all the volatile oils which have been examined, as well as of some other substances of a similar character, which commonly pass under the name.

Oil of Allia'ria. From the roots of *Alliaria officinalis*, or sauce-alone. Identical with the oil of black mustard.

Oil of All'spice. See OIL OF PIMENTO.

Oil of Al'monds. See OIL OF BITTER ALMONDS.

Oil of American Arbor Vitæ. *Syn.* HUILE CEDRE BLANC, Fr. From the fresh tops of *Thuja occidentalis*, or American arbor-vitæ tree. Yellow; fragrant; stimulant. *Used* in frictions for rheumatism. *Prod.* 1¼ to 2% (nearly).

Oil of Angel'ica. From the dried root of *Angelica Archangelica*. *Prod.* ·25% (fully).

Oil of An'iseed. *Syn.* OLEUM ANISI (Ph. L. E. & D.), O. ESSENTIALE ANISI, L. From the fruit (seeds) of *Pimpinella anisum*, or anise. Nearly colourless. It is very frequently adulterated with one or other of the cheaper oils, in which case spermaceti or camphor is added to it, to make it 'candy.'

Prop., &c. When pure, it congeals into a solid crystalline mass on being cooled to 50° Fahr., and does not melt again until heated to about 63°. Treated with iodine, it quickly congeals into a solid hard mass, with a perceptible increase of temperature, and the development of orange-coloured and gray fumes. Sulphuric acid, with heat, turns it of a rich purple-red colour, and the compound soon afterwards becomes inspissated and hard (resinified). In alcohol of ·806 it is soluble in all proportions, but rectified spirit (·838) dissolves only 42% of this oil. Sp. gr. (recent) ·9768; (one year old) ·9853 to ·9855; (old) ·9856 to ·9900. The foreign oil is generally the heaviest.

Oil of aniseed is carminative and pectoral; and both itself and preparations have long been in favour with the masses in coughs, colds, &c. In preparing it, care must be taken that the temperature of the water in the receiver and refrigerator does not fall lower than about 68° Fahr. *Prod.* (From the dried fruit of commerce) av. 2% (nearly). See OIL OF STAR-ANISE.

Oil, Ap'ple. See AMYL (Valerianate of), and ESSENCE OF APPLE.

Oil of Ar'nica. *Syn.* OLEUM ARNICÆ, O. A. RADICUM, L. From the roots of *Arnica montana*. Yellowish-brown. Sp. gr. ·940. *Prod.* 16 lbs. yielded 1 oz. of oil. The oil from the flowers of arnica is blue.

Oil of Asarabac'ca. *Syn.* OLEUM ASARI, O. ASARI LIQUIDUM, L. From the roots of *Asarum Europæum*. Yellow; glutinous. Two butyraceous oils pass over at the same time.

Oil of Assafœt'ida. *Syn.* OLEUM ASAFŒTIDA, L. From the gum resin. Contains sulphur. Very fetid and volatile.

Oil of Balm. *Syn.* OLEUM MELISSÆ, L. From the herb (*Melissa officinalis*). Pale yellow; fragrant. Sp. gr. ·970 to ·975. *Prod.* 100 lbs. of the fresh flowering herb yielded ¼ oz. of oil (M. Raybaud). A mixture of oil of lemons and rosemary is commonly sold for it.

Oil of Balsam of Peru. See CINNAMEINE.

Oil of Ber'gamot. *Syn.* BERGAMOT, ESSENCE OF B.; OLEUM BERGAMII, O. BERGAMOTÆ, L. By expression from the yellow portion of the rind of the fruit of *Citrus Bergamia*, or bergamot orange. Pale greenish-yellow; highly fragrant. It is obtained purer by distillation, but its perfume is then slightly less delicate. Sp. gr. ·875 to ·885. *Prod.* The rind of 100 bergamot oranges yielded by distillation nearly 3 oz. of oil. (M. Raybaud.)

Oil of bergamot is frequently adulterated with rectified spirit, or with the oils of lemons, oranges, or turpentine. The presence of these substances may be detected in the manner explained under OILS (Volatile), *Purity and Tests* (*antè*), as well as by the altered density of the oil. Pure bergamot oil is much more soluble in rectified spirit than either of the others, and is further distinguished from them by its free solubility in solution of potassa, forming a clear solution.

Oil of Bit'ter Almonds. *Syn.* ESSENCE OF B. A.; OLEUM AMYGDALÆ AMARÆ, O. A. ESSENTIALE, L. From the ground cake of bitter almonds from which the fixed oil has been expressed. The common plan is to soak the cake (crumbled to fragments) for about 24 hours in twice its weight of water, to which ⅓rd or ¼th of its weight of common salt has been added, and then to submit the whole to distillation, allowing the first half of the water that passes over to deposit its oil, and to run back again into the still. Pale golden-yellow; colourless when rectified; tastes and smells strongly nutty, like peach-kernels. It consists of 85% to 90% of hydride of benzoyl and 8% to 12% of hydrocyanic acid, with a variable quantity of benzoic acid and benzoin. The density varies a little with the age of the oil, and the temperature and rapidity with which it has been distilled. Sp. gr. (recent) 1·0525; (trade crude oil) 1·079 (G. Wippel); (old) 1·081 (1·0836—Pereira). "Essential oil of almonds, free from adulteration, should have a sp. gr. at most of 1·052." (Ure.) According to Prof. Redwood, the density may vary from 1·0524 to 1·0822. The light oil contains the most hydride of benzoyl, and the heavy oil the most benzoin. *Prod.* From less than ·2 to ·5%.

Pur. This oil is generally adulterated with cheaper oils, and in nearly every case with alcohol. When it is pure—Mixed with oil of vitriol, it strikes a clear crimson-red colour, without visible decomposition.—Mixed with an alcoholic solution of potassa, crystals are eliminated.—Iodine dissolves only partially and slowly in it, without further visible results.—Chromate of potassa does not affect it.—Nitric acid (sp. gr. 1·42) causes no immediate reaction, and in the course of 3 or 4 days crystals of benzoic acid begin to appear; but if only 8% or 10% of alcohol or rectified spirit is present, a violent effervescence speedily commences, and nitrous fumes are evolved. By using nitric acid, sp. gr. 1·5, the smallest quantity of alcohol may be detected.

Obs. This oil does not pre-exist in the almond, but is formed by the action of water on a peculiar crystallisable substance, called amygdalin. It is essentially the hydride of benzoyl, but it always contains a portion of hydrocyanic or prussic acid, to which it owes its very poisonous properties. It is occasionally employed as a substitute for hydrocyanic acid in medicine; but its principal consumption is as a flavouring ingredient and a perfume by cooks, confectioners, liquoristes, and perfumers. For this purpose it is dissolved in rectified spirits. (See ESSENCE.) *Dose.* ¼ to 1 drop.

An oil closely resembling that from bitter almonds is obtained by distillation from the leaves of the peach and cherry-laurel, the bark of the plum-tree, the bruised kernels of cherries, plums, and peaches, the pips of apples, and from several other vegetable substances that possess a nutty odour and flavour.

A NON-POISONOUS OIL OF ALMONDS has been introduced. This is simply the ordinary oil of commerce freed from hydrocyanic acid, and is intended to be substituted for the crude, poisonous oil for domestic purposes. Unfortunately, the purified essence does not keep well, and is often converted after a few months into little else than a solution of benzoic acid, almost devoid of the usual odour and flavour of the bitter almond. "No wonder, then, under such circumstances, that the public preferred the preparations they had been accustomed to, which were not so liable to change." (Redwood.) The following methods have been adopted for this purpose:—

1. (Liebig.) Agitate the crude distilled oil with red oxide of mercury, in slight excess, and, after a few days' contact, rectify the oil from a little fresh oxide of mercury. The product is quite pure, when the process is properly managed. The cyanide of mercury thus formed may be either employed as such, or reconverted into mercury and hydrocyanic acid.

2. (Mackay.) Commercial oil of almonds, 1 lb.; fresh-slaked lime, q. s. to form a milk-like liquid; afterwards add, of solution of potassa, 1¼ lb.; water, 3 pints; agitate occasionally for 48 hours, then distil over the oil, and rectify it from a fresh mixture of lime and potassa.

3. (Redwood.) The oil is mixed with an equal quantity of water, and the mixture is digested in a water bath with red oxide of mercury, and small quantities of fresh-slaked lime and protochloride of iron, with as little access of air as possible; as soon as decomposition of the acid has taken place, the whole is introduced into a copper retort, and submitted to distillation. The product is perfectly free from hydrocyanic acid. The first process is, however, the simplest, cheapest, and best.

The sp. gr. of this non-poisonous oil is 1·051. (G. Whippell.) That of pure, colourless hydride of benzoyl is 1·043; it boils at 356° Fahr.; is soluble in 35 parts of water, and in all proportions in alcohol and ether. Exposed to the air, it greedily absorbs oxygen, and becomes converted into a mass of crystallised benzoic acid. The purified oil of almonds does the same, only less rapidly.

Oil of Almonds (Facti″tious). *Syn.* ESSENCE OF MIRBANE, NITROBENZOL. The preparation of this article on the small scale is explained under NITROBENZOL. It is now extensively prepared as a substitute for the oil of almonds obtained by distillation. The following is Mansfield's process:—The apparatus consists of a large glass worm, the upper end of which is divided into two branches, gradually dilating so as to form two funnel-shaped tubes. Into one of these concentrated nitric acid is poured, and into the other benzol, which need not, for this purpose, be chemically pure. These bodies meet at the point of junction of the two tubes, and the rate of their flow is regulated by any appropriate means. Chemical reaction instantly takes place, and the new compound is cooled by its passage through the worm, which is refrigerated for the purpose. It has then only to be washed with water or a very weak solution of carbonate of soda for the process to be complete. The product has the sp. gr. 1·209, boils at 415° Fahr., has an intensely sweet taste, and an odour closely resembling, but not actually identical with, that of oil of bitter almonds. Unlike genuine oil of almonds or hydride of benzoyl, it is insoluble in water, and does not distil without suffering partial decomposition. It is chiefly used to scent soaps, and to adulterate the genuine oil. The benzol for this purpose is obtained from coal-tar. See BENZOL and NITROBENZOL.

Brand'y Oil. See GRAPE OIL.

Oil of Bu'chu. *Syn.* OLEUM BAROSMÆ, O. DIOSMÆ, L. From the leaves of *Diosma crenata.* Yellow; lighter than water; smells of the leaves.

Oil of Caj'eput. *Syn.* CAJEPUTI OIL, KYAPOOTIE O.; CAJEPUTI OLEUM (B. P.), OLEUM

CAJAPUTI (Ph. L. E. & D.), L. From the dried leaves of the *Melaleuca Cajeputi* (*Melaleuca minor*, B. P.). Colourless, when pure (that of commerce is usually green); odorous; aromatic; taste hot and penetrating. Its odour has been compared to a mixture of those of camphor and cardamoms. It boils at 343° Fahr. Sp. gr. ·925 to ·927. When rectified, about ⅞ths of the quantity passes over colourless, and has the density ·897; the remaining portion is green, and has the density ·920 to ·925. Its green colour is derived from chloride of copper, the presence of which may be recognised by the red precipitate occasioned by agitating the oil with a solution of ferrocyanide of potassium. (Guibourt.) From the East Indies.

Pure oil of cajeput is slightly soluble in water; entirely and freely soluble in alcohol; dissolves iodine; and when dropped on water, rapidly diffuses itself over the surface, and soon completely evaporates. A spurious kind (FACTITIOUS OIL OF CAJEPUT), made of oil of rosemary, flavoured with camphor and the oils of peppermint and cardamoms, and coloured with verdigris, is occasionally met with in the shops.

Oil of cajeput is a powerful antispasmodic and diffusible stimulant. *Dose*. 3 to 6 drops, on sugar; in cholera, colic, epilepsy, hysteria, rheumatism, spasms, toothache, &c.

Oil of Cam′phor. *Syn.* LIQUID CAMPHOR; OLEUM CAMPHORÆ, O. C. VOLATILE, L. Obtained from incisions in the wood of the camphor tree of Borneo and Sumatra (*Dryobalanops aromatica*), in which it exists in cavities in the trunk; also by distillation from the branches of the *Camphora officinarum*, or laurel camphor tree. Colourless, when rectified. Sp. gr. ·910. *Prod.* 60 lbs. of the crude brown oil yields 40 lbs. of pure white oil and 20 lbs. of camphor. It rapidly oxidises in the air. *Used* to scent soap. See CAMPHOR (Liquid).

Oil of Car′away. *Syn.* OLEUM CARUI (B. P., Ph. L. E. & D.), O. C. ESSENTIALE, L. From the fruit of *Carum Carui* (caraway seeds). Nearly colourless; aromatic; carminative. Sp. gr. ·940; (old) ·946 to ·950. *Prod.* Av. 5% (nearly). It is frequently adulterated with oil of cumin. Added to purgative medicines to prevent griping.

Oil of Car′damoms. *Syn.* OLEUM CARDAMOMI, O. C. ESSENTIALE, L. From the seed of *Elettaria Cardamomum*, or true cardamom. Colourless; fragrant; carminative. Sp. gr. ·943. *Prod.* 5% (nearly). The capsules ('lesser cardamoms') yield only about 1% of oil. (M. Raybaud.)

Oil of Cascaril′la. *Syn.* OLEUM CASCARILLÆ, L. From the bark of *Croton eleuteria* (Swartz.), or cascarilla tree. Very fragrant. *Prod.* ·4% to ·75%.

Oil of Cas′sia. *Syn.* OIL OF CHINA CINNAMON; OLEUM CASSIÆ (Ph. E.), L. From cassia buds, or from cassia bark. Golden-yellow; aromatic; fragrant. It is generally adulterated with rectified spirit. Nitric acid converts the pure oil into a crystalline mass. Sp. gr. 1·071 to 1·073; (old) 1·078 to 1·090. *Prod.* From the buds, 1% (barely); from the bark of commerce, ·75%. It is frequently sold for oil of cinnamon.

Oil of Cebadil′la. *Syn.* OIL OF SABADILLA; OLEUM CEBADILLÆ, L. A green butyraceous matter, obtained from *Asagræa officinalis*.

Oil of Ce′dar-wood. From the wood of a species of *Cedrus*. It consists of two hydrocarbons. One, a volatile liquid (cedrene), and the other a solid, crystalline compound, containing oxygen. *Prod.* ·2 to 25%.

Oil of Ce′drat. *Syn.* ESSENCE OF CEDRA; OLEUM CEDRI, O. CITRI FINUM, L. From the exterior yellow rind of the fruit of *Citrus medica* (Risso), or citrons, either by expression or distillation, as oil of bergamot. The first portion of oil that comes over is colourless; the latter portion, greenish. Very fragrant. Sp. gr. ·847. *Prod.* 100 citrons yield nearly 1 fl. oz. of pale, and ½ fl. oz. of green oil. See OIL OF CITRON (*below*).

Oil of Cel′ery Seed. *Syn.* OLEUM APII, L. From the fruit (seed) of *Apium graveolens*. Diuretic; stimulant. *Prod.* ¾ to 1% (nearly).

Oil of Cham′omile. *Syn.* OIL OF ROMAN CHAMOMILE; OLEUM ANTHEMIDIS (Ph. L. E. & D.), O. CHAMÆMELI, O. C. FLORUM, O. ESSENTIALE EX FLORIBUS C., L. From the flowers of *Anthemis nobilis*. In the Ph. L., English oil of chamomile (ANTHEMIDIS OLEUM, ANGLICUM) is ordered. Blue; turns yellow and brown by exposure and age; odour characteristic. Sp. gr., English (from the flowers), ·9083; foreign, ·9289. *Prod.* Fresh flowers, ·1% (barely); recently dried (finest commercial), 5%; av. of 6 dried samples, ·25% (nearly). If much water is employed, even the above small quantities of oil will not be obtained.

Oil of chamomile is reputed antispasmodic, tonic, and stomachic. 1 to 3 drops on a lump of sugar, taken just before retiring to rest, is an excellent preventive of nightmare, and will frequently induce quiet sleep where more active substances have failed. Unfortunately, the oil of the shops is generally either adulterated or old, and commonly both, in which case the oil acts as an irritant. A common plan is to mix it with old oil of lemons, a fraud which may be detected by the lessened density of the oil, and by its diminished solubility in rectified spirit.

Oil of Cher′ry-laurel. *Syn.* OLEUM LAUROCERASI, L. From the leaves of *Cerasus Laurocerasus*, or common laurel. Closely resembles oil of almonds, but is said to be weaker. Like that substance, it is powerfully poisonous. *Prod.* 100 lbs. fresh leaves (undeveloped, June), 10·13 oz.; do. (half-grown, June), 7·2 oz.; do. (full-grown, 8 weeks on tree, July), 4·96 oz.; do. (do., 3 months on tree, Sept.), 7·04 oz.; do. (15 months on tree), 2·24. (Christison.)

Oil of Cher'vil. *Syn.* OLEUM CHÆROPHYLLI, L. From the bruised fresh herb, macerated for 2 or 3 days in salt-and-water, and then distilled.

Oil of Cincho'na. *Syn.* OLEUM CINCHONÆ, L. From cinchona bark. Butyraceous; smells of the bark. 20 lbs. yield only 2 grs. (Trommsdorff.) The odour of bark is imitated by a solution of turmeric in potash, and by chloride of iron.

Oil of Cin'namon. *Syn.* HYDRIDE OF CINNAMYL; OLEUM CINNAMOMI (B. P., Ph. L. E. & D.), O. C. VERI, L. From the bark of *Cinnamomum zeylanicum*, macerated for several days in salt-and-water, and then distilled. Yellowish or red; very aromatic; both odour and taste resemble that of the bark. Sp. gr. 1·035. *Prod.* 11 lbs. yielded 1 oz.; 100 lbs. yielded 1·56 oz. (M. Raybaud.)

Pur. Oil of cinnamon, owing to its high price, and the consequent premium for its adulteration, can scarcely be obtained pure from the shops of this country. Oil of cassia and highly rectified spirit are the substances usually employed for this purpose. The increased sp. gr. resulting from the first, and the diminished sp. gr. from the second, afford ready means of detecting these frauds. The presence of oil of cassia may also be detected by an experienced person by the odour, which differs a little from that of pure oil of cinnamon. Oil of cassia is less limpid than oil of cinnamon, and it stands a greater degree of cold without becoming turbid or congealing. "Wine-yellow, when recent; cherry-red, when old; odour purely cinnamomic; nitric acid converts it nearly into a uniform crystalline mass." (Ph. E.) During this reaction the odour of bitter almonds is perceptible. Both oil of cassia and oil of cinnamon are thus converted into a brown balsam; with oil of cassia, however, a brisk decomposition occurs sooner, and at a slighter heat. It also forms a crystalline compound with ammonia. These reactions, unfortunately, are not characteristic. "The most distinguishing characteristic of the cinnamon oils is, perhaps, their relation to the alcoholic solution of caustic potash. Both dissolve in it readily and clear, with a reddish, yellowish-brown colour; after some time, however, the solution becomes very turbid, and a rather heavy undissolved oil precipitates, when the solution gradually becomes clear again." (Ure.) The palest oil is considered the best.

Obs. Oil of cinnamon is chiefly imported from Ceylen, where it is distilled from bark that is unfit for exportation. The dark coloured oil is usually rectified, when two pale oils are obtained, one lighter, and the other heavier, than water; but 10% of oil is lost by the process. The oil distilled from the root of the tree (O. CINNAMOMI RADICIS) is much weaker than that from the bark. The oil from the leaves (O. C. FOLIORUM), also imported from Ceylon, smells of cloves, but has a less density than oil of cloves.

Oil of cinnamon consists essentially of hydride of cinnamyl, but, unless when very recently prepared, it also contains a variable proportion of cinnamic acid formed by the oxidation of the hydride.

Oil of Cit'ron. *Syn.* ESSENCE OF CITRON; OLEUM CITRI, L. From the lees of citron juice; or, from the peels, as oil of lemons or bergamot. The last generally goes by the name of oil of cedrat. Both are fragrant. (See *above.*)

Oil of Citron-flowers. *Syn.* OLEUM CITRI FLORUM, L. Amber-coloured; highly fragrant. *Prod.* 60 lbs. yield 1 oz.

Oil of Cloves. *Syn.* ESSENCE OF CLOVES; OLEUM CARYOPHYLLORUM, O. CARYOPHYLLI (B. P., Ph. L. E. & D.), O. EUGENIÆ C. (Ph. D. 1826), L. From the unexpanded flowers (cloves) of the *Caryophyllus aromaticus*, or Molucca clove-tree, soaked for some time in salt-and-water, and then submitted to distillation; the distilled water, after having deposited its oil, being returned 3 or 4 times into the still, and again 'worked off' from the same materials. Nearly colourless, when recent, gradually becoming pale yellow, and ultimately light brown, by age; highly aromatic, with the characteristic odour and flavour of cloves. It is the least volatile of all the essential oils. Sp. gr. 1·055 to 1·061 (1·034 to 1·061, B. P.). *Prod.* 16% to 22%.

Pur. Oil of cloves is frequently adulterated with inferior essential oils, especially with those of pimento, pinks, and clove-gillyflowers, and, occasionally, with castor oil.—1. Pure oil of cloves forms a butyraceous coagulum when shaken with pure liquor of ammonia, which crystallises after fusion by a gentle heat.—2. Treated with an alcoholic solution of potassa, it entirely congeals into a crystalline mass, with total loss of its characteristic odour.—3. Shaken with an equal volume of strong caustic soda lye, it forms, on repose, a mass of delicate lamellar crystals.—4. Solution of chromate of potassa converts it into brown flakes, whilst the salt loses its yellow colour.—5. Chlorine turns it first green, and then brown and resinous.—6. Nitric acid turns it red, and a reddish-brown solid mass is formed; with heat, it converts it into oxalic acid.—7. It dissolves freely in sulphuric acid (oil of vitriol), yielding a transparent, deep reddish-brown solution, without any visible decomposition.—8. Mixed, gradually, with about ⅓rd of its weight of oil of vitriol, an acid liquor is formed, together with a resin of a rich purple colour, which, after being washed, is hard and brittle, and forms a red tincture with rectified spirit, which is precipitated of a blood-red colour by water.—9. It dissolves iodine freely, without any marked reaction.—10. It dissolves santaline freely.

Obs. Clove oil contains a heavy oil, sp. gr. 1·079 (caryophyllic acid), and a light oil, sp. gr. ·918 (clove hydrocarbon); by rectification, much of the light oil is lost, and the product becomes denser. (1·361—Bonastre.)

Oil, Cog'nac. See GRAPE OIL (*below*).

Oil of Copai'ba. *Syn.* OIL OF CAPIVI; OLEUM COPAIBÆ (B. P., Ph. L. & E.), L. 1. (Ph. E.) Balsam of capivi, 1 oz.; water, 1½ pints; distil, returning the water into the still, until oil ceases to pass over.

2. (*Wholesale.*) From the crude oil which separates during the manufacture of 'specific solution of copaiba' and 'soluble capivi,' by distillation along with a little salt-and-water.

Pur., *&c.* Colourless, when pure; that of commerce has frequently a greenish tinge, derived from the copper utensils; odour, not disagreeable when recent. Sp. gr. ·876 to ·878. *Prod.* 50% to 55%. When adulterated with oil of turpentine, its solubility in rectified spirit is greatly diminished, and the solution is turbid.—*Dose.* 10 to 15 drops, in sugar; in the usual cases in which copaiba is ordered. 20 to 60 minims, three times a day (B. P.).

Oil of Corian'der. *Syn.* OLEUM CORIANDRI, L. From the fruit (seeds) of *Coriandrum sativum.* Yellowish; aromatic; carminative. *Prod.* (Dried fruit) 5¼ to 6%.

Oil, Corn. The name given by Mulder to a peculiar fatty compound found in the fusel oil of the distilleries of Holland. It has a very powerful odour, resembling that of some of the unbelliferous plants, and is unaffected by caustic potassa. See FUSEL OIL (*page* 550).

Oil of Cu'bebs. *Syn.* OLEUM CUBEBARUM, O. CUBEBÆ (B. P., Ph. E. & D.), L. From the fruit of *Cubeba officinalis*, or cubebs, coarsely ground. Aromatic, hot, and bitter tasted; odour, that of the fruit; faintly green, colourless, when pure. Sp. gr. ·929. *Prod.* 9% to 11%.

Pur., *&c.* When pure, iodine has little action on this oil, and immediately gives it a violet colour, without any very marked reaction; nitric acid turns it opaque, and the mixture changes to a pale red when heated; sulphuric acid turns it of a crimson-red. When adulterated with oil of turpentine, both its viscidity, solubility in rectified spirit, and its density, are lessened; when mixed with castor oil, it leaves a greasy stain on paper.—*Dose.* 10 to 15 drops, in the usual cases in which cubebs in substance is given. 5 to 20 minims (B. P.), suspended in water by mucilage and sugar.

Oil of Cu'min. *Syn.* OLEUM CUMINI, O. CYMINI, L. From the fresh fruit (seed) of *Cuminum Cyminum*, or cumin. Pale yellow; smells and tastes strongly of the seeds. Sp. gr. ·975. *Prod.* 2½ to 3%.

Obs. Oil of cumin is a mixture of two oils differing in volatility, and which may be separated by careful distillation. The more volatile one has been named cymol; the other, cuminol.

Oil of Dill. *Syn.* OLEUM ANETHI (Ph. L. & E.), L. From the bruised fruit (seed) of *Anetheum graveolens.* Pale yellow; odour, that of the fruit; taste, hot and pungent; carminative. Sp. gr. ·881 to ·882. *Prod.* 4% (nearly).

Oil of El'der. *Syn.* ATTAR OF ELDER FLOWERS; OLEUM SAMBUCI, L. From elder flowers (*Sambucus nigra*). Butyraceous; odour not very marked.

Oil of El'emi. *Syn.* OLEUM ELEMI, L. From the resin. Isomeric with oil of turpentine.

Oil of Er'got. *Syn.* ETHEREAL O. OF E.; OLEUM ERGOTÆ, O. E. ÆTHEREUM, O. SECALIS CORNUTI, L. Prepared by evaporating the ethereal tincture at a very gentle heat, and, preferably, allowing the last portion of the ether to escape by spontaneous evaporation. Brownish-yellow; lighter than water; soluble in ether and solution of potassa; only partly soluble in alcohol. It appears to be a mixture of volatile and fixed oil, with some resinous matter. *Dose.* 10 to 20 drops, in hæmorrhages; 10 to 12 drops every 3 or 4 hours, in diarrhœa; 20 to 50 drops, as a parturifacient, &c. *Externally*, in rheumatism, toothache, &c.

Obs. The above is the oil of ergot now employed in medicine. It must not be confounded with other preparations occasionally called by the same name, but which differ from it in character. Among the latter are the following:—

a. A fixed oil obtained by distilling off the spirit from the alcoholic tincture. It has the odour of rancid fish oil, and the distilled spirit has also a putrid odour.

b. A fixed oil, obtained from coarsely powdered ergot by strong pressure between iron plates, at a heat of about 212° Fahr. It is fluid, coloured, smells strongly of the drug, but is nearly destitute of its leading qualities. Both the preceding contain some volatile oil and resinous matter.

c. An empyreumatic oil obtained by distilling ergot *per se.* It is light brown, viscid, acrid, and nauseous.

d. A volatile oil obtained by digesting powdered ergot in solution of potassa at 125° Fahr., diluting the saponaceous mass thus formed with one half to an equal weight of water, neutralising the alkali with dilute sulphuric acid, and then submitting the whole to distillation in a chloride of sodium or oil bath. It is white, adhesive, butyraceous, and tasteless. It appears a product, rather than a simple educt.

e. This is the ethereal oil, first described, in its purest form. It is colourless, translucent, oily, and acrid-tasted, with the odour of ergot; it has a high boiling-point, at which it suffers partial decomposition, but may be volatilised at a lower temperature, like the other oils. By long exposure to heat, it thickens and partly solidifies; light and air darken it; it is lighter than water, very slightly soluble in water, but sufficiently so to impart to it its peculiar odour; it is soluble in pure alcohol, in ether, the volatile and fixed oils, alkaline lyes, liquor of ammonia, creasote, and naphtha. The dilute mineral acids clear it, but do not produce any marked reaction.

Oil, Ethe″real. See OIL OF WINE (*below*).

Oil of Fen′nel. *Syn.* OLEUM FŒNICULI (Ph. L.), O. F. OFFICINALIS (Ph. E. & D.), O. F. DULCIS, L. From the fruit or seed of *Fœniculum dulce*, or sweet fennel (Ph. L.). Colourless; odour that of the plant; tastes hot and sweetish; congeals at 50° Fahr.; carminative and stomachic. It consists of two oils; the one solid and identical with that of oil of aniseed. When treated with nitric acid, it affords benzoin. Sp. gr. ·997. *Prod.* Dried fruit (of commerce), 3% to 3·5%. The flowering herb yields ·35% of a similar oil.

Obs. The oil of fennel of the shops is the product of the fruit of *Fœniculum vulgare*, or common, wild, or bitter fennel. It closely resembles that of sweet fennel, but is scarcely so agreeable either in taste or smell. It is chiefly used to scent soaps.

Oil, Fu′sel. Noticed at *page* 550.

Oil of Gal′banum. *Syn.* OLEUM GALBANI (Ph. Bor.), L. From galbanum, 2 lbs.; water, 16 fl. oz.; distilled together. Yellow; resembles oil of asafœtida, but milder.

Oil of Gar′lic. *Syn.* SULPHIDE OF ALLYL. From the bruised bulbs or 'cloves' of *Allium sativum*, or garlic. It possesses the peculiar odour, taste, and other properties of the bulbs, in a highly exalted degree.

Obs. When a mixture of oil of black mustard and sulphide of potassium is exposed in a sealed glass tube to a temperature above that of 212° Fahr., sulphocyanide of potassium and garlic oil are formed. On the other hand, when the compound of garlic oil and chloride of mercury (formed by adding to an alcoholic solution of the oil a like solution of the chloride) is gently heated with sulpho-cyanide of potassium, mustard oil, with all its characteristic properties, is called into existence.

Oil of Gaulthe″ria. See OIL OF PARTRIDGE BERRY (*below*).

Oil of Gen′tian. *Syn.* OLEUM GENTIANÆ, L. From the root. Butyraceous; smells strongly of gentian. 3 cwt. yield 1 dr. (barely).

Oil of Gera″nium. *Syn.* OIL OF GINGER GRASS, O. OF SPIKENARD. The oil of commerce which passes under this name is imported from the East Indies. It is not obtained from any species of *Geranium* or *Pelargonium*, but probably from a species of *Andropogon*. It is often employed to adulterate otto of roses. See GRASS OIL (*below*).

Oil of Gin′ger. *Syn.* OLEUM ZINGIBERIS, L. From the dried root (rhizome) of *Zingiber officinale*, or ginger of commerce. Bluish-green; possesses a less agreeable odour than that of good ginger, without any pungency. *Prod.* $\frac{1}{16}$ of 1% (M. Raybaud).

Oil of Grain-spirit. *Syn.* GRAIN OIL. Two distinct substances are found in spirit distilled from fermented grain; one of which is butyraceous and highly offensive (corn oil of Mulder— ?), the other liquid (crude fusel oil). The relative proportions of these substances to each other, and to the spirits which they contaminate, vary with the materials and the management of the process. The 'GRAIN OIL' of the London rectifiers consists chiefly of fusel or potato oil, mixed with alcohol and water, and with small and variable proportions of solid ethyl- and amyl-compounds of certain fatty acids (œnanthic and margaric). The latter are said to be similar to the butyraceous matter before referred to, as well as the solid fat of the whiskey distilleries conducted on the old plan. According to Mr. Rowney, the fusel oil of the Scotch distilleries contain capric acid. See CORN OIL (*above*), and FUSEL OIL.

Oil, Grape. *Syn.* BRANDY OIL, COGNAC O. This is essentially the sulphate of amyl. It is prepared by dissolving the fusel oil of marc-brandy in strong rectified spirit, and then adding concentrated sulphuric acid; alcohol and excess of acid is removed by washing the newly formed compound with water. Dissolved in rectified spirit, it forms 'BRANDY ESSENCE,' which is used to impart the Cognac flavour to plain spirit. See SULPHATE OF AMYL and AMYL-ETHER, also OIL OF MARC-BRANDY (*below*).

Oil, Grass. Several of the grasses (*Gramінaceæ*) yield fragrant volatile oils. See OIL OF GERANIUM, GRASS OIL (of Namur), OIL OF LEMON-GRASS, OIL OF SPRING-GRASS, &c.

Oil, Grass (of Namur). *Syn.* INDIA GRASS OIL. From *Andropogon Calamus aromaticus* (Royle), supposed to have been the "sweet cane" and "rich aromatic reed from a far country" of Scripture; formerly supposed to be obtained from *Andropogon Iwarancusa*. Stimulant and highly fragrant. See OIL OF SPIKENARD.

Oil of Hops. *Syn.* OLEUM LUPULI, L. From commercial hops, by distillation along with water. It may also be collected during the brewing of beer. Odorous; acrid; narcotic; soluble in water; becomes resinous by exposure and age. Sp. gr. ·910. Chiefly used to increase the aroma and flavour of old or damaged hops.

Oil of Horse-mint. *Syn.* OLEUM MONARDÆ (Ph. U. S.), L. From the fresh herb of *Monarda punctata*, a plant indigenous in the U. S. of America. Dark amber-coloured; fragrant; pungent; carminative; rubefacient; and vesicant.

Oil of Horse-rad′ish. *Syn.* OLEUM ARMORACIÆ, L. From the fresh roots of *Cochlearia armoracia* (Linn.), or common horse-radish. Pale yellow; heavier than water; acrid; vesicant; identical with that from black mustard. *Prod.* ·5% (nearly).

Oil of Hyssop. *Syn.* OLEUM HYSSOPI, L. From the flowering herb of *Hyssopus officinalis*. Aromatic; stimulant. *Prod.* ·25 to ·33%.

Oil of Jargonelle Pear. See AMYL (Acetate).

Oil of Jas'min. *Syn.* Oil of jessamine; Oleum jasmini, O. j. volatile, L. From the flowers of *Jasminum grandiflorum* and *J. fragrans*, carefully picked, by placing them in alternate layers with cotton wadding imbued with olive oil, in any suitable vessel, and renewing the flowers till the fixed oil becomes strongly odorous, and then distilling the wadding along with a little water. The volatile oils of hyacinths, jonquil, tuberose, violets, and most of the more delicate flowers, are obtained in the same way. *Used* in perfumery. From the East Indies.

Oil of Ju'niper. *Syn.* Juniperi oleum (B. P.), Oleum Juniperi (Ph. L. E. & D.), O. è. baccis j., O. essentiale è. b. j., L. From either the wood, tops, or berries, preferably the last. The berries should be chosen fully grown, but still slightly green, and should be bruised before being placed in the still. In the Ph. L., English oil of juniper (O. juniperi, Anglicum) is ordered. Colourless, or very pale greenish-yellow; odour and taste, sweet and terebinthinate; rather viscid; soluble in rectified spirit; rendered opaque and resinous by exposure and age. It is reputed carminative and diaphoretic, and possesses powerful diuretic properties. Sp. gr. ·911 (English, ·8688; foreign, ·8834—Brande). *Prod.* Green berries, ·25%; ripe do. (one year old), ¾ to 1% (fully).

Pur. It is frequently adulterated with oil of turpentine, a fraud readily discovered by the lessened density, viscidity, and solubility, in rectified spirit, of the oil.

Obs. Oil of juniper consists of two oils—one, white and most volatile, sp. gr. ·8393; the other, dark-coloured and less volatile, sp. gr. ·8784; together with some resin left in the retort.

Oil, Krumholz. *Syn.* Oleum templinum, L. From Hungarian balsam, a terebinthinate exudation from the *Pinus pumilio*, or mountain pine of Southern Europe. Fragrant; golden-yellow; tastes oily, acidulous, and resinous.

Oil of Lau'rel. *Syn.* Oil of sweet bay; Oleum lauri volatile, O. l. essentiale, L. From either the berries or leaves of *Laurus nobilis* (Linn.), or sweet bay-tree. Pale yellow, clear, odorous, aromatic, stimulant, and narcotic. Sp. gr. ·871. *Prod.* From the leaves, ¾ to 1% (fully).

Oil of Lavender. *Syn.* Essence of l.; Lavandulæ oleum (B. P.), Oleum lavendulæ (Ph. L.), O. l. veræ (Ph. E. & D.), O. l. spicæ, O. l. essentiale, O. l. florum, L. The "oil (oleum lavandulæ, Anglicum) distilled from the flowers of '*Lavandula vera*' (Ph. L.). Very pale lemon-yellow; highly fragrant; taste, warm and not disagreeable; carminative, antispasmodic, and stimulant. Sp. gr. ·877 to ·905. According to Brande, the sp. gr. of the oil obtained from the flowers only is ·8960; that from the whole plant, ·9206. The lightest is esteemed the best. *Prod.* Flowers, 1¼ to 2% (nearly). The whole of the flowering herb is commonly distilled. According to Raybaud, the herb, *after flowering* (Sept.), yields the most oil.

Pur. Alcohol is the substance commonly used to adulterate this oil; but, occasionally, oil of bergamot is used for the same purpose. If the density is below ·87, there is reason to suspect adulteration. When pure—1. Sulphuric acid turns it reddish-brown, and the reaction is accompanied by strong inspissation.—2. It fulminates quickly and violently with iodine, and the thick syrupy residue possesses a pungent, acid, balsamic odour. The oils of the other labiate plants fulminate much less powerfully with iodine. The presence of alcohol weakens, but does not destroy, the action of this test, unless it is added in an equal volume, when only a lively effervescence and a disengagement of orange-coloured vapours are produced by the iodine, without fulmination.—3. Santaline is nearly insoluble in pure oil of lavender, and exerts no marked action on it, but is freely soluble in oil of lavender adulterated with alcohol or rectified spirit.

Obs. English oil of lavender possesses the purest fragrance; and of this, the variety known as 'Mitcham oil of lavender,' from the place of its preparation, is esteemed the best. The foreign oil of lavender is inferior. This last is improved by rectification. See Oil of Spike.

Oil of Lem'ons. *Syn.* Essence of l.; Oleum limonis (B. P.), Oleum limonis, O. limonum (Ph. L. E. & D.). From the yellow portion of the rind, grafted, placed in hair bags, and exposed to powerful pressure; also by distillation, but the product is then less agreeably fragrant and sweet, but keeps better. Nearly colourless; odour that of the fruit. Sp. gr. ·8752 to ·8785. Expressed oil, ·8517, distilled do., ·847, at 72° Fahr. (Ure). *Prod.* 100 lemons yield, by expression, 1¾ to 2 oz. (nearly); by distillation 1¼ to 1½ oz.

Pur. Commonly adulterated with oil of turpentine, and occasionally with nut or poppy oil. These may be detected in the manner already explained. When pure, it is soluble in all proportions in absolute alcohol, but rectified spirit only dissolves 16% of it. It also boils at 148° Fahr., whereas oil of turpentine boils at 312°, and mixtures of the two at intermediate temperatures, depending on the proportions.

Oil of Lem'on Grass. *Syn.* Essence of l. g., Indian grass-oil, Oil of verbena. Probably from *Andropogon citratum*, the Indian lemon-grass. Pale yellow; powerfully fragrant. Citronelle oil is also the product of this or of an allied species of *Andropogon*.

Oil of Lemon Thyme. *Syn.* Oleum serpylli, L.; Huile de tain, Fr. From the fresh flowering herb of *Thymus serpyllum*, the lemon or wild thyme of our hills and pastures. Very fragrant. Used to scent soaps, &c. Sp. gr. ·867. *Prod.* 100 lbs. yield 2¼ to 5¼ oz. of oil. When pure, it is scarcely affected by iodine, but solution of chromate of potassa acts on it with energy.

Oil of Let'tuce. *Syn.* OLEUM LACTUCÆ VIROSÆ, L. From *Lactusa virosa* (Linn.), or strong-scented wild lettuce. Closely resembles the odorous matter of opium.

Oil of Limes. *Syn.* OLEUM LIMETTÆ, L, From the rind of the fruit of *Citras Limetta*, or lime, as oil of lemons, which it somewhat resembles. *Prod.* 100 limes yield 2¼ to 2½ oz. of oil.

Oil of Lov'age. *Syn.* OLEUM LEVISTICI, L. From the leaves of fruit of *Levisticum officinale*, lovage. Pale yellow, aromatic, carminative. *Prod.* Fresh herb, ·1% to ·15%.

Oil of Mace. *Syn.* OLEUM MACIDIS, O. M. ESSENTIALE, O. M. STILLATITIUM, L. From the arillus of *Myristica officinale* (commercial mace). Nearly colourless; fragrant; lighter than water; closely resembles oil of nutmeg. Sp. gr. ·945. *Prod.* 4¼ to 9%.

Oil of Marc-brandy. *Syn.* FUSEL OIL OF M.-B., O. OF GRAPE SPIRIT. Obtained after the spirit (marc-brandy) has passed over during the distillation of the fermented residuum of expressed grapes. Limpid; odorous; acrid; offensive; soon turns yellow in the air; soluble in 1000 parts of water, and in all proportions in rectified spirit; 6 or 7 drops will spoil a hogshead of brandy. According to M. Balard, this oil is a mixture of potato oil and œnanthic ether.

Oil of Mar'joram. *Syn.* OIL OF SWEET M.; OLEUM MARJORANÆ, O. ORIGANI M. (Ph. E.), L. From the fresh flowering herb of *Origanum Marjorana*, or sweet or knotted marjoram. Pale yellow; odorous; tonic; stimulant. Sp. gr. ·925 (·940—Baumé) *Prod.* ·33 to ·5%. See OIL OF ORIGANUM.

Oil of Mea'dow-sweet. *Syn.* OLEUM SPIRÆÆ ULMARIÆ, L. From the flowers or flowering tops of *Spiræa ulmaria* (Linn.), or common meadow-sweet. This oil is a native hydride of sailcyl. It is yellow, sweet-scented, and slightly soluble in water, which then strikes a deep violet colour with the persalts of iron. It boils at 385° Fahr. Sp. gr. 1·172. (See *below*.)

Oil of Mea'dow-sweet (Facti''tious). This is prepared as follows:—Salicin, 1 part, is dissolved in distilled water, 10 parts, and being placed in a glass retort, bichromate of potassa (in powder), 1 part, is added, followed by oil of vitriol, 2½ parts, previously diluted with 4 times its weight of water; a gentle heat is next applied to the retort, and after the first effervescence resulting from the mutual reaction of the ingredients is over, the heat is increased, and the mixture is distilled for the oil in the usual manner. The product is absolutely identical with the natural oil of meadow-sweet. (See *above*.)

Oil of Mil'foil. *Syn.* OLEUM MILLEFOLII, L. From the flowers of *Achillæa Millefolium* (Linn.), or yarrow. Blue. Sp. gr. ·852. *Prod.* 14 lbs. of the dried flowers yielded 3 drs. of oil.

Oils, Mixed (Essential). *Syn.* OLEA MIXTA ESSENTIALIA. From the oils of bergamotte and lemons, of each, 1 oz.; oils of lavender and pimento, of each, ½ oz. *Used* to scent 'sal volatile drops,' smelling-bottles, &c.

Oil of Mus'tard (Volatile). *Syn.* SULPHOCYANIDE OF ALLYL; OLEUM SINAPIS NIGRÆ, O. S. ESSENTIALE, L. From the seeds of *Sinapis nigra* (Linn.), or black mustard), as oil of bitter almonds. Nearly colourless; intensely acrid, pungent, rubefacient, and vesicant; slightly soluble in water; boils at 289° Fahr. It contains sulphur. Sp. gr. 1·035 to 1·038; 1·015, at 68° Fahr. *Prod.* Av. ·6% (fully).

Obs. This oil, like that of bitter almonds, does not pre-exist in the seed, but is the result of the action of myronic acid on a peculiar substance, myrosin, in the presence of water. Oil of black mustard has been used as a stimulant or counter-irritant in palsy, &c.; and the distilled water, or a solution of the oil in water, is said to be an excellent and cleanly remedy for the itch.

Oil of Myrrh. *Syn.* OLEUM MYRRHÆ, O. M. ESSENTIALE, L. Colourless; thin; heavier than water; stimulant; smells strongly of the drug.

Oil of Myr'tle (Volatile). *Syn.* ESSENCE OF M.; OLEUM MYRTÆ ESSENTIALE, L. From the flowers and leaves of *Myrtus communis*. 100 lbs. of the fresh leaves yield 2¼ to 5 oz.

Oil of Namur Grass. See GRASS OIL OF NAMUR.

Oil of Narcis'sus. *Syn.* ESSENCE OF JONQUIL; OLEUM NARCISSI, L. As OIL OF JASMINE. Delightfully odorous.

Oil of Nero'li. See OIL OF ORANGE-FLOWERS.

Oil of Nut'meg (Volatile). *Syn.* OLEUM MYRISTICÆ (B. P., Ph. E.), O. M. MOSCHATÆ (Ph. D.), L. From the officinal nutmeg or kernel of the fruit of *Myristica moschata*. Nearly colourless; odour and flavour that of the fruit, but more powerful. By agitation with water, it is separated into two oils—one lighter, the other heavier, than water; the last is butyraceous. Sp. gr. ·948. *Prod.* 4¼ to 7%. It is reputed to make the hair grow, and to prevent baldness.

Oil of On'ions. From the bulbs of *Allium Cepa*, or common onion. Contains sulphur, and smells strongly of the herb.

Oil of Or'ange. *Syn.* ESSENCE OF O.; OLEUM AURANTII, O. AURANTIORUM, O. A. CORTICIS, L. From the yellow portion of the rind of either the Seville or sweet orange, preferably of the last; as oil of bergamot or lemons. Closely resembles oil of lemons, but is more agreeably fragrant. The expressed oil is very apt to become opaque, and deposit a stearopten, especially in cold weather, unless well kept from the air. Sp. gr. ·875. *Prod.* 100 fruits yield 4 to 5 oz. (See *below*.)

Oil of Orange-berries. *Syn.* OLEUM AURANTII BACCÆ, L. From the small unripe fruit of the orange-tree. Does not keep well. (See *below*.)

Oil of Orange-flowers. *Syn.* Neroli, Oil of n., Essence of n.; Oleum naphæ, O. aurantii florum, Aurantii oleum (Ph. E. and D.), L. From the flowers of either the bitter (Seville) or sweet orange (*Citrus vulgaris* or *C. aurantium*), by distillation with water. That from the fruit is said to be preferred, but there does not appear any actual difference between the two. Very fluid; lighter than water, in which it is slightly soluble; it is delightfully aromatic and fragrant, but the odour differs slightly from that of the flowers. *Prod.* 100 lbs. of flowers gathered in May or December yield 3 to 6 oz. of oil; 6 cwt. of the fresh flowers yield 1 lb. of oil.

Pur. Neroli is commonly adulterated with alcohol or essence de petit grain, and generally with both of them. The presence of the first is easily determined (see *above*); that of the second can only be discovered by comparing the odour evolved during the evaporation of a drop of the suspected oil, placed on a piece of white paper, with a like drop of pure neroli similarly treated. (See *above* and *below*.)

Oil of Orange-leaf. *Syn.* Oleum aurantii folii, L.; Essence de petit grain, Fr. From the leaves of either the bitter or sweet orange; that from the first being preferred. Delightfully fragrant. Extensively used to adulterate oil of neroli, and is itself commonly sophisticated with both alcohol and oil of orange-berries. (See *above*.)

Oil of Orig'anum. *Syn.* Oleum origani, O. o. essentiale, L. From the flowering herb of *Origanum vulgare*, or common or winter marjoram. Pale yellow colour; fragrant; acrid, pungent, and rubefacient. Sp. gr. ·927 (·940—Baumé). *Prod.* ·5% to 75%. The dark-coloured oil of origanum of the shops is obtained from *Thymus vulgare*. The oil of origanum (Ph. E.) is oil of *Origanum marjorana*. See Oils of Marjoram, Thyme, and Lemon Thyme.

Oil of Or'ris. *Syn.* Essence of violet; Oleum iridis, L. From the dried rhizomes of *Iris Florentina*, or Florentine orris-root, Fragrant. Sold for oil and essence of violets.

Oil of Par'sley. *Syn.* Oleum petroselini, L. From the fresh herb or dried fruit (seed) of *Apium petroselinum*, or garden parsley. Yellowish; smells strongly of the plant. It consists of two oils, separable by agitation with water, one of which is concrete, and melts at 80° Fahr.; the other, liquid. *Prod.* Herb, ·50 to 1% (nearly).

Oil of Par'tridge-berry. *Syn.* Oil of winter-green, Methylo-salycilic ether, Salicylate of oxide of methyl; Oleum gaultheriæ (Ph. U. S.), L. From the leaves or the whole plant of *Gaultheria procumbens*, a herb common in North America, and otherwise known by the names—Box-berry, chequer-berry, partridge-berry, mountain tea, winter-green, &c. Pale yellow, growing brown by exposure and age; aromatic; sweet; highly pungent; when diluted, agreeably fragrant; mixed with a dilute solution of potassa, it solidifies to a crystalline mass (salicylate of methyl and potassa), from which the oil may be again separated by the addition of an acid. It is the heaviest of all the essential oils. Sp. gr. 1·173. Boils at 412°, and, when purified, at 435° Fahr.

Oil of partridge-berry, dissolved in rectified spirit, is in common use in the United States of America as an antispasmodic, carminative, diuretic, emmenagogue, and stimulant; chiefly as an adjunct to mixtures, &c.; and also with the view of increasing the flow of milk during lactation. It is likewise extensively used in perfumery, and is an object of great interest to the organic chemist, on account of its peculiar constitution and reaction.

Oil of Partridge-berry (Facti''tious). See Salicylic Acid.

Oil, Pearl. See Amyle (Acetate of), and Essence of Jargonelle Pear.

Oil of Pennyroy'al. *Syn.* Oleum pulegii (Ph. L.), O. menthæ p. (B. P., Ph. E. & D.), O. p. essentiale, L. From the flowering herb of *Mentha Pulegium*, or the common pennyroyal of our gardens. Pale yellow, growing reddish-yellow by age and exposure; antispasmodic, carminative, and emmenagogue. Boils at 395° Fahr. Sp. gr. ·925 to ·931. *Prod.* ¾ to 1%. (See *below*.)

Oil of Pennyroyal (American). *Syn.* Oleum hedeomæ (Ph. U. S.), L. From *Hedeoma pulegioides*, as the last. Light yellow; closely resembles oil of pennyroyal, for which it passes in the U. S. Sp. gr. ·945 to ·948.

Oil of Pepper. *Syn.* Oil of black p.; Oleum piperis, O. p. nigri, L. From bruised black pepper (*Piper nigrum*). Colourless, turning yellow; odorous; pungent; not so hot as the spice. Sp. gr. ·9932. *Prod.* 1·25% to 1·5%. White pepper (of commerce), 1% (barely).

Oil of Pep'permint. *Syn.* Oleum menthæ piperitæ (B. P., Ph. L. E. & D.), O. essentiale m. piperitidis, L. From the fresh flowering herb of *Mentha piperita*, or garden peppermint. Nearly colourless, or at most a very pale greenish-yellow; powerfully odorous; tastes pungent, at the same time imparting a sensation of coldness to the tongue and palate. Boils at 365° Fahr. Sp. gr. ·902 to ·905. *Prod.* Fresh flowering herb, ·25% to ·4%; dried do., 1% to 1·25% (fully). In a warm dry season, 5 lb. of the fresh flowering herb yield 1 oz. of oil; in a wet and unfavorable one, 11 lb. yield barely the same quantity.

Pur. The oil of commerce usually contains fully a third part of rectified spirit, and is also frequently adulterated with the oils of rosemary, spearmint, and turpentine. When pure —1. It is soluble in its own weight of rectified spirit.—2. Mixed with 1-4th its volume of nitric acid, a rich purple-red colour is developed.—3.

Chromate of potash, in solution, turns it of a deep reddish-brown colour, and converts it into a soft coagulum, which assumes a flaky form when divided with a glass rod, whilst the solution of the salt loses its yellow colour or becomes greenish-yellow.—4. With iodine it forms a homogeneous mass, without fulmination. If it explodes with iodine, it contains turpentine. The yellowish, resinous oil, sold under the name of 'American' or 'crude oil of peppermint,' consists chiefly of oil of turpentine, and on evaporation leaves a residuum of pine resin.

Obs. English oil of peppermint is the best, a fact clearly shown by its price in the market being so greatly above that of the imported oil. The oil distilled at Mitcham, in Surrey (Mitcham oil of peppermint), is the most esteemed. It has usually a very pale greenish colour, which is often imitated by steeping a leaf or two of green mint or parsely in the oil. Old dark-coloured oils are commonly bleached by exposure to the light, to the destruction of a portion of their other properties.

Oil of peppermint is stimulant, antispasmodic, and carminative, and has always been a favourite remedy in flatulence, nausea, vomiting, loss of appetite, cramp of the stomach, colic, griping pains, diarrhœa, the early stage of cholera, &c.—*Dose.* 1 to 3 drops, on sugar.

Oil of Petro'leum. See NAPHTHA, OILS (Mineral), PETROLEUM, &c.

Oil of Pim'ento. *Syn.* OIL OF ALLSPICE; OLEUM PIMENTÆ (B. P., Ph. L. E. & D.), L. From the bruised fruit of *Eugenia pimenta*, allspice, or Jamaica pepper. Pale yellow, growing reddish-brown by age; odour, a combination of cloves and cassia; taste, pungent. Sp. gr. 1·021. *Prod.* 5% to 8%.

Obs. Oil of pimento contains two oils similar to those found in clove oil. When pure, nitric acid turns it red, with active effervescence and the assumption of a rusty brown colour. It combines with the salifiable bases in a nearly similar manner to oil of cloves. It is much used in perfumery, especially in hair cosmetics.

Oil of Pim'pernel. *Syn.* OLEUM PIMPINELLÆ, L. From the root of *Sanguisorba officinalis*, or pimpernel. Blue; carminative.

Oil, Pine-ap'ple. This artificial essential oil dates its commercial importance from the Great Exhibition of 1851. It is essentially butyric ether, and may be regarded as simply the crude form of that substance. On the large scale, it is prepared by saponifying butter or crude butyric acid with a strong lye of caustic potassa, and dissolving the resulting soap in the smallest possible quantity of hot alcohol; to the solution is added a mixture of alcohol and oil of vitriol in excess, and the whole is then submitted to distillation as long as the product has an aromatic fruity odour; the product is rectified from dried chloride of calcium and a little litharge. Dissolved in rectified spirit, it is much used as a flavouring substance by confectioners and liquoristes. See ETHER (Butyric) and ESSENCE OF PINE-APPLE, &c.

Oil of Pota'to Spirit. See AMYL (Hydrate of) and FUSEL OIL.

Oil of Ravensa'ra. *Syn.* OLEUM RAVENSARÆ, L. From the roots of *Ravensara aromatica*. Chiefly used to adulterate oil of cloves, which it somewhat resembles.

Oil of Rho'dium. *Syn.* OLEUM RHODII, L. Said to be derived from the wood of species of *Rhodoriza*. Very fluid and limpid; pale yellow; soon darkens by age and exposure; tastes bitter and aromatic; has a modified odour of roses. Chiefly used as a substitute for otto of roses in cheap perfumery, and to adulterate it. Oil of sandal-wood is frequently sold for it. *Prod.* 1% to 16%. See OIL OF ROSES (*below*).

Oil of Ro''ses. *Syn.* OLEUM ROSÆ, L. *Prep.* 1. From the petals of *Rosa sempervirens* (Linn.), or the musk rose, as oil of cloves, observing to keep the water in the worm-tub at 85° Fahr., and afterwards subjecting the water in the receiver to refrigeration. Resembles otto of roses, of which it is merely a variety. *Prod.* $\frac{1}{20}$ to $\frac{1}{18}$ of 1%.

2. (ATTAR OF ROSES, OTTO OF R.; OLEUM ROSÆ—Ph. E.) From the petals of *Rosa centifolia* and *Rosa sempervirens* (damask and musk rose), principally the first, by saturating the water, by returning it repeatedly on fresh flowers, and then exposing it to a low temperature. In the East Indies it is obtained by stratifying gingilly seeds in alternate layers with rose petals, for some days, and repeating the arrangement with fresh roses till the seeds are saturated, when the oil is expressed and distilled along with water. In the neighbourhood of Mecca the rose leaves are macerated in salt-and-water for 2 or 3 days, and then distilled, the water being received in separate receivers at different parts of the process. The water is afterwards exposed in porous earthenware vessels, tied over with linen, in trenches dug in the earth, and over which moistened straw is thrown, when in a short time the otto separates and floats on the surface.

Prop., *&c.* Colourless, or nearly so; odour intense, penetrating, and diffusive, and in a concentrated state far from pleasant, but when dilute very agreeable; taste, bland and sweetish; when pure, it congeals at 80°, and does not remelt until heated to fully 85° Fahr.; 1000 parts of alcohol of ·806 dissolve only 7 parts of otto at 57° Fahr., and only 33 parts at 72°. Sp. gr. ·832 at 90°, to water 1·000 at 60° Fahr. *Prod.* 100 lbs. of roses yield 2 to 3 dr.

Pur. Otto of roses is frequently adulterated with the oils of rhodium, sandal-wood, and geranium, and with camphor; and occasionally with spermaceti, to give the spurious compound the usual crystalline appearance. The following are reliable tests:—1. Pure otto has a bland, sweet taste; if it is bitter, it contains oil of rhodium or sandal-wood; if it is pungent, or 'bites' the palate, it contains either oil of geranium or camphor, and probably both; if it imparts an unctuous sensation, it contains spermaceti.—2. Exposed for some hours to the fumes of a small quantity of iodide under a bell-glass in the cold, pure otto remains white, and continues so when exposed to the air; an adulterated sample, on the contrary, becomes yellow or brown, and afterwards, on exposure to the air, continues to darken in colour, until it becomes of a deep brown, or even perfectly black, according to the quantity of foreign oil present. A single drop may be thus tested.—3. (Guibourt.) One or two drops of the suspected oil are put into a watch-glass; the same number of drops of concentrated sulphuric acid are added, and the two fluids are mixed with a glass-rod. All the oils are rendered more or less brown by this proceeding; but, otto of roses retains the purity of its odour—oil of geranium acquires a strong and disagreeable odour, which is perfectly characteristic—the odour of the oil of rhodium is increased, and becomes somewhat unctuous, and, in general, it acquires an odour distinctly like that of cubebs.

Oil of Rose'mary. *Syn.* ROSMARINI OLEUM (B. P.), OLEUM ANTHOS, O. RORISMARINI, O. ROSMARINI (Ph. L. E. & D.), O. RORISMARINI ESSENTIALE, L. From the flowering tops of *Rosmarinus officinalis.* In the Ph. L., English oil of rosemary (O. ROSMARINI, ANGLICUM) is ordered, as it is superior to that from abroad. Colourless; strongly fragrant, but scarcely agreeable unless compounded; carminative and stimulant. Boils at 365° Fahr. Sp. gr. ·910; recent, ·897; rectified, ·8887. *Prod.* $\frac{3}{4}$ to 1% (nearly).

Pur., &c. It is frequently adulterated with oil of turpentine. When pure, it dissolves in all proportions in spirit of ·830. By age it deposits a crystalline stearoptene, and acquires a terebinthinate odour. It is chiefly used as a stimulant in liniments, hair oil, pomatums, &c.

Oil of Rose'wort. *Syn.* OIL OF ROSE-ROOT; OLEUM RHODIOLÆ, L. From the roots of *Rhodiola rosea.* Yellowish; odour resembles that of oil of rhodium, for which it is often sold, as well as the distilled water for rose water. 1¼ lb. yields about 1 dr.

Oil of Rue. *Syn.* RUTÆ OLEUM (B. P.), OLEUM RUTÆ (Ph. L. & E.), L. The "oil distilled from the fresh herb of *Ruta graveolens.*" (B. P.), or common rue. Pale yellow, turning brown by age, and depositing a brownish, resinous sediment; congeals at about 40° Fahr.; acrid, bitter; odour that of the plant; stimulant, antispasmodic, and emmenagogue. Sp. gr. ·909 to ·911. *Prod.* $\frac{1}{4}$ to 1% (nearly). According to Raybaud, the recent dried seeds yield fully four times as much oil as the flowering herb.

Pur. Nearly always adulterated. When pure—1. It forms a clear solution with rectified spirit.—2. It does not form a camphor with gaseous hydrochloric acid.—3. Iodine dissolves in it slowly, without any apparent reaction, beyond a darkening and a slight increase of viscidity.—4. It is unaffected by a solution of chromate of potassa.—5. Nitric acid very slowly changes it into a greenish-yellow liquid balsam.—6. If it forms a reddish-brown solution with liquor of potassa and a still darker one with oil of vitriol, or if it fulminates with iodine, it is adulterated with the oil of some labiate plant.—7. It is more soluble in both rectified spirit and water than any of the oils used to adulterate it.

Oil of Saf'fron. *Syn.* OLEUM CROCI, L. From the pistils of *Crocus sativus* (saffron). Yellow; heavier than water; acrid, pungent, and narcotic; decomposed by exposure to light and age, with the formation of a white solid matter, which is lighter than water.

Oil of Sage. *Syn.* OLEUM SALVIÆ, L. From the herbaceous portion of *Salvia officinalis*, or common sage.

Oil of San'dal-wood. *Syn.* OLEUM SANTALI, O. S. ALBI, L. From the wood of *Santalum album*, or sandal-tree, and preferably from that of Malabar. It has an odour somewhat resembling that of oil of rhodium, for which it is commonly used; also used to adulterate otto of roses. *Prod.* 9 lbs. yield 1 oz.; 100 lbs. yield 5 oz. (Raybaud).

Oil of Sarsaparil'la. *Syn.* OLEUM SARZÆ, L. From the root bark, distilled along with salt-and-water. Acrid; odour and flavour same as the root.

Oil of Sas'safras. *Syn.* VOLATILE OIL OF S.; OLEUM SASSAFRAS (Ph. E.), O. LAURI S., O. S. OFFICINALIS, L. From bruised sassafras chips, the sliced root of *Sassafras officinale*, as oil of cloves. Pale yellow; highly odorous; hot, pungent, rubefacient, and stimulant; reputed alterative, sudorific, and diuretic, and, as such, occasionally given in rheumatism, cutaneous affections, &c. Sp. gr. 1·094 to 1·096. *Prod.* 1½ to 2% (fully).

Pur., &c.—1. If the density is lower than 1·094, it is adulterated.—2. Nitric acid acts on this oil, at first slowly, merely turning it of an orange-red, but afterwards with violence, and a reddish-brown resin is formed.—3. Mixed with about one half its weight of sulphuric acid, a green colour is at first developed, which, by heat, is changed to a blood-red. A large quantity of sulphuric acid acts at once violently, white fumes are given off, and mere charcoal is left.—4. With iodine it forms a permanently clear solution, or at least one that remains so for some time.—5. By agitation with water, it separates into two oils—one lighter, the other heavier, than that fluid.

Oil of Sav'ine. *Syn.* OLEUM SABINÆ (B. P.), OLEUM JUNIPERI SABINÆ, O. SABINÆ (Ph. E. & D.), L. From the fresh tops or leaves of *Juniperus sabina*, or common savin. Pale yellow; limpid; acrid, pungent, and stimulant. It possesses the general properties of the plant in a highly exalted degree. Sp. gr.

·915. *Prod.* Fresh herb, 1·25 to 1·5%; dried do. (recent), 2¼ to 3%. *Dose.* 2 to 6 drops; as an anthelmintic, diaphoretic, and emmenagogue. Its use must be carefully avoided during pregnancy or disease of the abdominal viscera.

Pur., &c. It is less frequently adulterated than the other volatile oils. Its high sp. gr. and free solubility in rectified spirit offer the means of detecting the presence of either oil of turpentine or alcohol, the substances occasionally added to it. A mixture of equal parts of oil of savin and oil of vitriol, by distillation from milk of lime, furnishes an oil apparently identical with oil of thyme. (Winckler.)

Oil of Sen′na. *Syn.* OLEUM SENNÆ VOLATILE, L. Possesses the nauseous odour and flavour of the leaves, and, as well as the distilled water, is purgative.

Oil of Spear′mint. *Syn.* ENGLISH OIL OF SPEARMINT (B. P.), OIL OF MINT, OIL OF GREEN M.; MENTHÆ VIRIDIS OLEUM (B. P.); OLEUM MENTHÆ VIRIDIS (Ph. L. E. & D.), O. M. SATIVÆ, O. ESSENTIALE MENTHÆ S., L. From the fresh flowering herb of *Mentha viridis* (Linn.), or garden or spearmint. Pale yellow; reddened by age; odour and general properties resemble those of oil of peppermint, but it is less grateful. It boils at 320° Fahr. Sp. gr. ·915 (·9394, Brande). *Prod.* ·2% to ·25%. Its common adulterants are alcohol and oil of turpentine.

Oil of Spike (True). *Syn.* FOREIGN OIL OF LAVENDER; OLEUM SPICÆ, O. S. VERUM, O. STÆCHADIS, O. LAVANDULÆ S., L.; HUILE D'ASPIC, Fr. Chiefly from *Lavandula spica* and *L. Stæchas*, or French and Alpine lavenders. It differs from English oil of lavender by its darker green colour and inferior odour. From France. *Used* by artists to mix their colours in, and to make varnishes. Oil of turpentine scented with lavender is commonly sold for it. *Prod.* From *L. spica* (fresh), ¾ to 1⅓%; *L. Stæchas* (dried), ¾ to 1% (fully).

Oil of Spike′nard. *Syn.* OLEUM NARDI, L. The precious oil mentioned under this name in Scripture is supposed to have been derived from *Andropogon Iwarancusa*. The commercial oil of geranium (see *above*) is also called by this name.

Oil of Spring Grass. *Syn.* OLEUM ANTHOXANTHI ODORATI, L. From *Anthoxanthum odoratum*, or sweet-scented vernal grass. It is this oil gives the very agreeable odour to new hay.

Oil of Star-an′ise. *Syn.* BADIAN OIL; OLEUM BADIANI, O. ANISI STELLATI, L. From the capsules of *Illicium anisatum*, or star-anise. It continues liquid at 35½° Fahr. This, and its weaker reaction with iodine, distinguish it from the preceding compound, which it is commonly used to adulterate. *Prod.* 2% (fully).

Oil of Sweet Fen′nel. See OIL OF FENNEL.

Oil of Sweet Flag. *Syn.* OLEUM ACORI, O. A. AROMATICA, L. From the rhizomes or roots of *Acorus Calamus* (Linn.), or sweet flag. Yellow; agreeably fragrant. *Used* to scent snuff, aromatic vinegar, &c. *Prod.* Fresh rhizomes, ¾ to 1%; dried (recent), 1 to 1·25°.

Oil of Tan′sy. *Syn.* OLEUM TANACETI, L. From the flowering herb of *Tanacetum vulgare* (Linn.), or tansy. Pale greenish-yellow; very odorous; bitter; aromatic. Sp. gr. ·946 to ·950. *Prod.* Fresh, ·25 to 5%; dried (recent), ¾ to 1% (fully).

Oil of Thyme. *Syn.* OLEUM THYMI; OIL OF ORIGANUM, OLEUM ORIGANI (of the shops). From the flowering herb of *Thymus vulgaris* (Linn.), or garden thyme. Nearly colourless; the imported oil has a reddish colour, which it loses by rectification; very fragrant; acrid, hot tasted, stimulant, and rubefacient; boils at 354° Fahr. Sp. gr. ·867 to ·875. *Prod.* ·5% to ·75%.

Obs. This is the dark-coloured 'OIL OF ORIGANUM' of the shops. It is frequently adulterated with oil of turpentine. It is occasionally *used* in toothache and in stimulating liniments; but its chief consumption is in perfumery, more particularly for hair-oils, pomatums, and hair-washes, as it is reputed to make the hair grow and to prevent baldness.

Oil of Tobac′co (Volatile). From the leaves of *Nicotiana tabucum* (Linn.), or the tobacco plant. Concrete.

Oil of Tur′pentine. *Syn.* SPIRIT OF T., ESSENCE OF T., TURPS, CAMPHENE, CAMPHINE; TEREBINTHINÆ OLEUM (B. P.), SPIRITUS TEREBINTHINÆ, ESSENTIA T., OLEUM TEREBINTHINÆ (Ph. L. & D.), O. T. PURIFICATUM (Ph. E.), L. The oil of turpentine of commerce is obtained by distilling strained American turpentine along with water. The residuum in the still is 'resin' or 'rosin.' The product in oil varies from 14% to 16%. The Colleges order it to be rectified before being employed for medicinal purposes. This is effected by re-distilling it along with 3 or 4 times its volume of water, observing not to draw over quite the whole. The portion remaining in the retort (balsam of turpentine) is viscid and resinous. A better plan is to well agitate it with an equal measure of solution of potassa or milk of lime before rectifying it. This is the plan adopted for the camphine used for lamps. By agitating crude oil of turpentine with about 5% of sulphuric acid, diluted with twice its weight of water, and after repose and decantation rectifying it from 5 or 6 times its volume of the strongest lime water, a very pure and nearly scentless oil may be obtained. Dr. Nimmo recommends oil of turpentine to be purified by agitation with ⅛th part of rectified spirit, after repose to decant the spirit, and to repeat the process 3 or 4 times. The product retains, however, fully ⅛th part of spirit in solution, and hence this method is objectionable, except for medicinal purposes, for which, according to Dr. Garrod, it is better than the oil purified by rectification. The sweet spirits of turpentine (SPIRITUS TEREBINTHINÆ DULCIS), vended of late years in the shops, is simply the common oil which has been agitated with, and rectified from, somewhat dilute sulphuric acid.

Prop. Pure oil of turpentine is colourless; limpid; very mobile; neutral to test-paper; has an odour neither powerful nor disagreeable when recently prepared, but becoming so by exposure to the air; dissolves ⅐th part of alcohol of ·830; is soluble in 6 parts of ether and in 7½ parts of rectified spirit; hot strong alcohol dissolves it freely, but the greater part separates in globules as the liquid cools. Oil of vitriol chars it, and strong nitric acid attacks it violently, even with flame. It congeals at 14°, and boils at 312° Fahr. Sp. gr. ·867; that of the oil of the shops varies from ·872 to ·878. It possesses a very high refractive power. At 72° it absorbs 163 times its volume of hydrochloric-acid gas (if kept cool), and in 24 hours from 26% to 47% of crystals (KIND'S CAMPHOR) separate. These have a camphoraceous odour, and, after being washed with water, and sublimed along with some dry chalk, lime, or charcoal, assume the form of a white, translucent, flexible, crystalline mass, which is volatile, soluble in alcohol, and possesses a considerable resemblance to camphor. A nearly similar substance is produced by the action of oxygen gas on oil of turpentine.

Uses, &c. Oil of turpentine is extensively used in the manufacture of varnishes and paints. Under the name of 'camphine,' it is occasionally employed for burning in lamps. For the last purpose it must be newly rectified and preserved from the air. By exposure, it rapidly absorbs oxygen, resin is formed, its density increases, and it gives a dull fuliginous flame. In medicine, it is employed as a diaphoretic, stimulant, vermifuge, &c.—*Dose.* 6 to 30 or 40 drops; in rheumatism, hemicrania, &c., 1 fl. dr. every four hours, in combination with bark or capsicum; in tape-worm, 3 fl. dr. to 1 fl. oz., either alone or combined with a little syrup of orange peel, every 8 hours, until the worm is expelled. The common symptoms of large doses of this oil are dizziness and a species of temporary intoxication, and occasionally nausea and sickness, which subside after two or three alvine evacuations, leaving no other effect, when the oil is pure, than a certain degree of languor for a few hours. In tape-worm, a little castor-oil may be advantageously combined with the second and subsequent doses. Oil of turpentine imparts a violent odour to the urine. To prevent loss by evaporation and resinification, this oil should be kept in tin cans or glass bottles. For store vessels, closely covered tin cisterns are the best. To *prevent accidents,* it is proper to caution the operator of the extremely penetrating and inflammable nature of the vapour of this oil, even in the cold. During the process of its distillation, without the *greatest* precautions are taken, an explosion is *almost inevitable.*

Oil of Vale″rian. *Syn.* OLEUM VALERIANÆ (Ph. Bor.), L. From the root of *Valeriana officinalis* (Linn.), or wild valerian. Yellowish; viscid; lighter than water; smells strongly of the plant. By exposure to the air, it is partly converted into valerianic acid, and more readily so under the influence of an alkali. In its usual form it consists of valerol, a neutral oily body; borneene, a volatile liquid hydrocarbon; and valerianic acid. It is powerfully antispasmodic, emmenagogue, tonic, and stimulant, and, in large doses, narcotic.—*Dose.* 2 to 6 drops; in epilepsy, hysteria, hemicrania, hypochondriasis, low fevers, &c. *Prod.* 1¼ to 2% (nearly).

Oil of Ver′bena. *Syn.* OLEUM VERBENÆ, L. From the fresh flowering herb of *Verbena odorata.* *Prod.* ·2% to ·5%. The 'OIL OF VERBENA' of the shops is imported from India, and is obtained from *Andropogon citratum.* See OIL OF LEMON GRASS.

Oil of Wine. *Syn.* HEAVY OIL OF WINE, ETHEREAL OIL, OILY ETHEREAL LIQUOR, SULPHATE OF ETHER AND ETHEROLE; OLEUM ÆTHEREUM (Ph. L.), OLEUM VINI, LIQUOR ÆTHEREUS OLEOSUS, L. This is an artificial production which, for convenience, may be included under this head.

1. (Ph. L.) Rectified spirit, 2 pints, and sulphuric acid, 36 fl. oz., are cautiously mixed together in a glass retort, and submitted to distillation until a black froth appears, when the retort is immediately removed from the fire (sand heat); the lighter, supernatant liquor is next separated from the fluid in the receiver, and exposed to the air for 24 hours; it is then agitated with a mixture of solution of potassa and water, of each, 1 fl. oz., or q. s., and, when sufficiently washed, is, lastly, separated from the aqueous liquid from which it has subsided. The formula of the Ph. L. 1836 is nearly similar.

2. (Ph. D.) Rectified spirit and oil of vitriol (commercial), of each, 1½ pint; as the last, employing a Liebig's condenser, and a capsule for the exposure to the air; the oil is then transferred to a moistened paper filter, and washed with a little cold water, to remove any adhering acid.

3. (Ph. D. 1826.) From the residuum in the retort after the process of preparing ether, distilled to one half, by a moderate heat, and the oil treated as before.

4. From rectified spirit (sp. gr. ·833), 2 parts; oil of vitriol, 5 parts; mix and distil, as before; wash the product with distilled water, and free it from adhering water and undecomposed alcohol by exposure in the vacuum of an air-pump, between two open capsules, the one containing fragments of solid potassa, and the other concentrated sulphuric acid. Pure.

5. By distilling a mixture of ether and oil of vitriol, and treating the product as before.

6. By the destructive distillation of dry sulphovinate of calcium; the product is freed

from alcohol, &c., by washing it. This process yield the largest product.

Prop., *&c.* An oily liquid, nearly colourless, neutral, with an aromatic taste, and an odour resembling that of oil of peppermint. It is insoluble in water, but freely soluble in both alcohol and ether; boiling water converts it into sulphovinic acid, and a volatile liquid called light or sweet oil of wine; with an alkaline solution, this effect is produced with even greater facility. Sp. gr. 1·05 (Hennel & Ph. L.); 1·13 (Serullas). Boils at 540° Fahr. "Dropped into water, it sinks, the form of the globule being preserved." (Ph. L.) *Prod.* 1·25 to 1·5%; 33 lbs. of rectified spirit, and 64 lbs. of oil of vitriol, yield 17 oz. of this oil (Hennel).

Uses. Oil of wine is reputed anodyne, but is only used in the preparation of other compounds. See SPIRIT OF ETHER (Compound), &c.

Oil of Wine (Light). *Syn.* SWEET OIL OF WINE. See ETHERIN, ETHEROLE, and *above*.

Wood Oil (of India). From the *Chloroxylon Swietenia* (De Cand.), the tree which yields the satin-wood of the cabinet-makers. Another wood oil (GŪRJUN BALSAM) is obtained by incision from various species of *Dipterocarpus*. This balsam yields about 38% of a volatile oil by distillation, which in its general properties closely resembles OIL OF COPAIBA. (O'Shaughnessey.)

Oil of Worm'seed. *Syn.* OLEUM CHENOPODII (Ph. U. S.), L. From the seeds of *Chenopodium anthelminticum*, or Jerusalem oak (American wormseed). Light yellow, or greenish; powerfully anthelmintic. Sp. gr. ·908.—*Dose.* For an adult, 25 to 30 drops, in sugar, honey, or milk, night and morning, for 3 or 4 days, followed by a good dose of castor oil, or some other suitable purgative.

Oil of Worm'wood. *Syn.* OLEUM ABSINTHII, L. From the herbaceous portion of *Artemisia Absinthium*, or common wormwood; green or brownish-green; odorous; acrid; bitter; stomachic. Sp. gr. ·9703 (Brisson); ·9720 (Pereira); ·9725 (Brande). *Prod.* Fresh herb (picked), ¼ to ⅓ %; dry herb (a year old), ½ % (fully); do. (recent), ¾ to 1% (fully).

Pur. That of the shops is nearly always either adulterated or partly spoiled by age; hence the discrepancies in the densities given for this oil by different authorities. A specimen of this oil distilled by Mr. Cooley from the green plant had the sp. gr. ·9712; but after being kept for 12 months, it had increased to ·9718. Nitric acid of 1·25 colours the pure oil first green, then blue, and, lastly, brown. The positive character of these reactions is in direct proportion to the purity and freshness of the sample.

OILY EMUL'SION. See LINCTUS (Emollient).

OILY ETHE'REAL LIQ'UOR. See OIL OF WINE (*above*).

OINT'MENT. *Syn.* UNGUENTUM, L. Any soft, fatty substance applied to the skin by inunction. The term is now commonly restricted to those which are employed in medicine.

Ointments (unguenta) differ from 'cerates' chiefly in their consistence, and in wax not being a constant or essential constituent; and they are made and used in a nearly similar manner to that class of preparations. Their proper degree of solidity is that of good butter, at the ordinary temperature of the atmosphere. When the active ingredients are pulverulent substances, nothing can be more suitable to form the body of the ointment than good fresh lard, free from salt; but when they are fluid or semifluid, prepared suet, or a mixture of suet and lard, will be necessary to give a due consistence to the compound. In some instances wax is ordered for this purpose. Another excellent 'vehicle' for the more active ingredients is a simple ointment, formed by melting together 1 part of pure white wax with about 4 parts of olive oil. The use of the last excludes the possibility of the irritation sometimes occasioned by the accession of rancidity, when inferior lard is employed. In a few cases butter is employed to form the body of the ointment.

Some ointments are made from recent vegetable substances by infusion or coction, in the manner adopted for medicated oils. See OILS, MEDICATED.

The precautions to be used in the choice of lard are noticed in the article devoted to this substance. Lard is included in the Materia Medica of the London College. In the last Ph. D. lard for medicinal use (ADEPS SUILLUS PRÆPARATUS—Ph. D.) is ordered to be prepared by melting it in twice its weight of boiling water, stirring it constantly for some time, then setting the mixture aside to cool; and, lastly, separating the fat when it has solidified.

Ointments are best preserved by keeping them in salt-glazed earthen or stoneware jars, covered with tin foil, in a cool situation.

The accession of rancidity in ointments and other unctuous preparations may be greatly retarded, if not wholly prevented, by previously dissolving in the fat about 2% of gum-benzoin, in fine powder, or rather less quantity of benzoic acid, by the aid of heat. This addition renders the ointment peculiarly soothing to irritable or highly sensitive skins. Poplar buds act in a similar manner.

⁂ The formulæ for all the more useful and generally employed ointments are given below. Those not included in the list may be prepared of the proper strength for all ordinary purposes, by combining about 12 to 15 times the medium dose of the particular medicinal with 1 oz. of lard or simple ointment. For substances which possess little activity, ½ to 1 dr. per oz., or even more, may be taken. See CERATE, FAT, &c.

Ointment of Ac'etate of Lead. *Syn.* UNGUENTUM PLUMBI ACETATIS (B. P., Ph. E. & D.), L. *Prep.* 1. (Ph. E.) Acetate of lead, in fine powder, 1 oz.; simple ointment, 20 oz.; mix them thoroughly (by trituration).

2. (Ph. D.) Ointment of white wax, 1 lb.; melt by a gentle heat, then add, gradually, of acetate of lead, in very fine powder, 1 oz., and stir the mixture until it concretes.

3. (B. P.) Acetate of lead, in fine powder, 12 grs.; benzoated lard, 1 oz.; mix.

Obs. A useful, cooling, astringent, and desiccative ointment. For the formula of Ph. L., see CERATE.

Ointment, Ace′tic. See VINEGAR OINTMENT.

Ointment of Ac′onite. *Syn.* UNGUENTUM ACONITI, L. *Prep.* 1. (Dr. Turnbull.) Alcoholic extract of aconite, 1 part; lard, 2 parts; carefully triturated together. In neuralgia, &c.

2. (Ammoniated; UNGUENTUM ACONITI AMMONIATUM — Turnbull.) Ammoniated extract of aconite, 1 part; lard, 3 parts. In neuralgia, paralysis, old rheumatic affections, &c. The use of the above preparations of aconite requires the greatest caution. They are intended as substitutes for OINTMENT OF ACONITINE, a still more dangerous preparation.

Ointment of Acon′itine. *Syn.* UNGUENTUM ACONITINÆ, L. *Prep.* 1. (Dr. Garrod.) Pure aconitine, 1 gr.; lard, 1 dr.; mix by careful trituration.

2. (Dr. Turnbull.) Aconitine, 2 grs.; rectified spirit, 6 or 7 drops; triturate together, then add of lard, 1 dr., and mix well.

3. (B. P.) Aconitia (aconitine), 8 grs.; rectified spirit, ½ dr.; dissolve and add lard, 1 oz.; mix.

Use, &c. As a topical benumber in neuralgic affections, rheumatic pains, &c. Its application generally occasions considerable tingling, and sometimes redness of the part to which it is applied, followed by temporary loss of sensation in the skin and the cessation of the pain. For slight cases Dr. Paris formerly employed only 1 gr. to the oz. Owing to the intensely poisonous nature of aconitine, this ointment must be both prepared and used with great caution, and must never be applied to an abraded surface. It is seldom employed, owing to its extreme costliness. See ACONITINE, and *above*.

Ointment, Ague. See ANTI-PERIODIC OINTMENT.

Ointment, Albinolo's. See PATENT MEDICINES.

Ointment, Alkaline. *Syn.* UNGUENTUM ALKALINUM, L. *Prep.* 1. (Biett.) Carbonate of soda, 2 drs.; fresh-slaked lime, 1 dr.; powdered opium, 2 grs.; lard, 2 oz.; mix by trituration. In prurigo, ringworm, and some other cutaneous affections.

2. (Cazenave.) Carbonate of potassa, 1 dr.; lard, 1 oz. In psoriasis, lepra, and scorbutic eruptions.

3. (Devergie.)—*a.* From carbonate (not sesquicarbonate) of soda, 10 to 15 grs.; lard, 1 oz. In lichen.

b. From carbonate of soda, 20 to 30 grs.; lard, 1 oz. In ichthyosis, lepra, psoriasis, and some other scaly skin diseases.

c. From carbonate of soda, ½ to 1 dr.; lard, 1 oz. In porrigo favosa, especially when occurring in adults.

4. (Soubeiran.) Carbonate of soda, 1 to 2 drs.; wine of opium, 1 fl. dr.; lard, 1 oz. In any of the above affections, when there is much pain or irritation.

Obs. Carbonate of potassa is thought to be preferable to carbonate of soda, when the above affections occur in scorbutic habits. A little camphor is also occasionally added.

Ointment of Al′um. *Syn.* UNGUENTUM ALUMINIS, L. *Prep.* 1. Alum, in very fine powder, 1 dr.; lard, 1½ oz. In piles.

2. To the last add of powdered opium, 7 grs. In piles, when there is much pain. See BAYLEY'S OINTMENT.

Ointment, Ammoni′acal. *Syn.* UNGUENTUM AMMONIACALE, U. AMMONIÆ, L.; LIPAROLE D'AMMONIAQUE, POMMADE DE GONDRET, Fr. *Prep.* 1. (P. Cod.) Suet and lard, of each, 1 oz.; melt in a strong wide-mouthed bottle, add of liquor of ammonia (sp. gr. ·923), 2 oz., at once close the bottle, and agitate it until its contents concrete. As little heat as possible should be employed, to prevent unnecessary loss of ammonia.

2. (Gondret.) Lard, 3 parts; suet, 2 parts; almond oil, 1 part; strong solution of ammonia, 6 parts; mix, as before. Rubefacient, vesicant, and counter-irritant. Smeared over the skin and covered so as to prevent evaporation, it raises a blister in 5 or 6 minutes. Its general effects and uses are similar to those of compound liniment of ammonia.

Ointment of Car′bonate of Ammo″nia. *Syn.* UNGUENTUM AMMONIÆ CARBONATIS, U. A. SESQUICARBONATIS, L. *Prep.* From carbonate of ammonia, 1 dr.; lard, 9 drs. An excellent application to painful joints, indolent tumours, scrofulous sores, &c.

Ointment of Ammo′niated Mercury. *Syn.* UNGUENTUM HYDRARGYRI AMMONIATI (B. P.). Ammoniated mercury, 62 grs.; simple ointment, 1 oz., mix. See next preparation.

Ointment of Ammo″nio-chloride of Mercury. *Syn.* WHITE PRECIPITATE OINTMENT; UNGUENTUM HYDRARGYRI AMMONIO-CHLORIDI (Ph. L.), U. H. PRECIPITATI ALBI, U. PRECIP. A. (Ph. E.), U. H. SUBMURIATIS AMMONIATI (Ph. D. 1826), L. *Prep.* 1. (Ph. L.) Ammonio-chloride of mercury, 2 drs.; lard, 3 oz.; triturate together.

2. (Ph. E.) As the last, but employing heat.

Uses, &c. Alterative; detergent; stimulant. In itch, scald-head, and various other skin diseases; in inflammation of the eyes; as an application to scrofulous and cancerous tumours; to destroy vermin on the body, &c. It "may be safely used" (in small quantities) "on infants." (A. T. Thomson.)

Ointment, An″glo-Saxon. *Prep.* Heat olive oil, 1 pint, and bees' wax, ¼ lb., until the mixture acquires a reddish-brown colour; then add red lead (levigated), ¼ lb., and continue the heat, with constant stirring; when the union appears complete, add of amber and burnt alum, of each, in fine powder, ½ oz.; lastly, when considerably cooled, add of powdered camphor, 3 drs. As a dressing to foul ulcers.

Ointment, An'odyne. See OINTMENT OF OPIUM, HEMLOCK, &c.

Ointment of An'thracoka'li. *Syn.* POMMADE DE ANTHRACOKALI, Fr. *Prep.* (Dr. Polya.) Anthracokali, in very fine powder, 1 part; lard, 30 parts. See ANTHRACOKALI.

Ointment, Antiherpet'ic. *Syn.* UNGUENTUM ANTIHERPETICUM, L. *Prep.* 1. (Alibert.) Red sulphide of mercury, 3 drs.; powdered camphor, 1 dr.; lard, 3 oz.

2. (Chevallier.) 'Subsulphate of mercury' (Turpeth mineral), 2 drs.; chloride of lime, 3 drs.; almond oil, 6 drs.; lard, 2 oz. In herpes or tetters.

Ointment, Antimo'nial. See OINTMENT OF POTASSIO-TARTRATE OF ANTIMONY.

Ointment, Antiperiod'ic. *Syn.* AGUE OINTMENT; UNGUENTUM ANTIPERIODICUM, U. FEBRIFUGUM, L. *Prep.* 1. Disulphate of quinine, 1½ dr.; saccharine carbonate of iron, 1 dr.; oil of cajeput, 30 drops; fresh butter, 1 oz.

2. (Antonini.) Sulphate of quinine, 1 oz.; rectified spirit and sulphuric acid, of each, q. s. lard, 4 oz.

Uses, &c. About ½ oz. of either of the above to be rubbed on the vertebral regions once every 2 or 3 hours for 3 or 4 days, in intermittent fevers, more especially in those accompanied by vomiting; or, into the epigastrium, in cholera, diarrhœa, or dysentery.

Ointment, Aromat'ic. *Syn.* BALSAMUM STOMACHALE WACKERI, UNGUENTUM AROMATICUM, L. *Prep.* (Ph. Austr. 1836.) Simple ointment, 2½ lbs.; yellow wax and oil of laurel, of each, 3 oz.; melt together, and, when considerably cooled, add of oils of juniper, mint, lavender, and rosemary, of each, 2 drs. Anodyne, balsamic, and stimulant.

Ointment, Arsen'ical. *Syn.* OINTMENT OF WHITE ARSENIC; UNGUENTUM ARSENICALE, U. ARSENICI, U. ACIDI ARSENIOSI, L. *Prep.* 1. Arsenious acid (levigated), 3 grs.; lard or simple ointment, 1 oz. In lepra, psoriasis, malignant whitlows, &c.

2. (Hosp. F.) Levigated white arsenic, 15 to 20 grs.; lard, 1 oz. As a dressing for cancerous sores.

3. (Soubeiran.) White arsenic, 1 dr.; lard and spermaceti ointment, of each, 6 drs. In malignant cancer. The above must be carefully prepared, and used with great caution. See CERATE.

Ointment of Arse''niate of I'ron. *Syn.* UNGUENTUM FERRI ARSENIATIS, L. *Prep.* 1. (Carmichael.) Arseniate of iron, ½ dr.; phosphate of iron, 2 drs.; spermaceti ointment, 6 drs.

2. (Dr. Pereira.) Arseniate of iron, ½ dr.; lard, 1½ oz. In cancer.

Ointment, Astrin'gent. *Syn.* UNGUENTUM ASTRINGENS, L. *Prep.* Triturate powdered catechu, 1½ dr., with boiling water, 2 fl. drs., add, gradually, of spermaceti ointment (melted), 1½ oz., and continue the trituration until the mass concretes. An excellent dressing for ill-disposed sores and ulcers, especially during hot weather. See the several LEAD OINTMENTS, OINTMENT OF GALLS, &c.

Ointment of Atro''pia. *Syn.* UNGUENTUM ATROPIÆ (B. P.), L. *Prep.* 1. Atropia, 1½ gr.; simple ointment, 1 dr.; mix by careful trituration.

2. (Dr. Brookes.) Atropia, 5 grs.; lard, 3 drs.; otto of roses, 1 drop. In neuralgia, rheumatic pains, &c., when the affection is not deeply seated.

3. (B. P.) Atropia, 8 grs.; rectified spirit, ½ dr.; lard, 1 oz.; dissolve the atropia in the spirit and mix with the lard.

Ointment, Bailey's. See ITCH OINTMENT.

Oil of Bal'sam of Peru. *Syn.* UNGUENTUM BALSAMI PERUVIANI, L. *Prep.* 1. Lard or spermaceti ointment, 1 oz.; balsam of Peru, 1 dr.; melt together by the heat of boiling water, stir for 5 or 6 minutes, allow it to settle, and pour off the clear portion. In chaps and abrasions.

2. (Compound; UNG. B. P. COMPOSITUM—Copland.) Lard, 1 oz.; white wax, ¼ oz.; balsam of Peru, 1 dr.; melt as before, and when nearly cold, add of oil of lavender, 10 or 12 drops. As the last, and to restore the hair.

Ointment, Banyer's. *Syn.* COMPOUND ALUM OINTMENT; UNGUENTUM ALUMINIS COMPOSITUM, U. CALOMELANOS, U. BANYERI, L. *Prep.* From burnt alum and calomel, of each, 1½ oz.; carbonate of lead or litharge (levigated), 2 oz.; Venice turpentine, ½ lb.; lard, 2 lbs.; carefully triturated together. In milk-scald, porrigo, &c.

Ointment of Bark. See OINTMENT OF CINCHONA.

Ointment, Basil'icon. *Syn.* BASILICON, YELLOW B.; UNGUENTUM BASILICUM; U. B. FLAVUM, L. *Prep.* (Ph. L. 1746.) Olive oil, 16 fl. oz.; yellow wax, yellow resin, and Burgundy pitch, of each, 1 lb.; melt, remove the vessel from the fire, and stir in of common turpentine, 3 oz. This form is still occasionally employed in some shops, but is generally superseded by the resin cerate and resin ointment of the Pharmacopœias. A nearly similar preparation, under the name of 'basilicon ointment,' is contained in the Ph. Bor. 1847. (See *below*.)

Ointment, Basilicon (Black). See OINTMENT OF PITCH.

Ointment, Basilicon (Green). *Syn.* UNGUENTUM BASILICUM VIRIDE, L. *Prep.* (Ph. L. 1746.) Prepared verdigris, 1 oz.; yellow basilicon, 8 oz.; olive oil, 3 fl. oz. Detergent. *Used* to keep down fungous growths, to dress syphilitic ulcers, &c. See CERATE and OINTMENT OF VERDIGRIS.

Ointment, Bateman's. See ITCH OINTMENT.

Ointment of Bay-leaves. See LAUREL OINTMENT.

Ointment of Belladon'na. *Syn.* UNGUENTUM BELLADONNÆ (B. P., Ph. L.). *Prep.* 1. (Ph. L.). Extract of belladonna (deadly nightshade), 1 dr.; lard, 1 oz.; mix by trituration.

2. (Soubeiran.) Fresh belladonna leaves (bruised), 1 part; lard, 2 parts; simmer together until the leaves become crisp, and, after digestion for a short time longer, drain with pressure.

3. (B. P.). Extract of belladonna, 1; rubbed with a few drops of water, and mix with lard, 5½.

Uses, &c. As a local anodyne, in painful and indolent tumours, nervous irritations, &c. Also as an application to the neck of the uterus in cases of rigidity. (Chaussier.)

4. (Compound; UNGUENTUM BELLADONNÆ COMPOSITUM, L.)—*a.* (W. Cooley.) Compound iodine ointment, 7 drs.; extract of belladonna, 1 dr. Powerfully discutient. A most excellent application to all glandular tumours and indurations, buboes, &c., which it is desirable to disperse instead of mature, more especially when there is much pain. It is particularly suitable to cases occurring on shipboard, and when its application (at least twice a day) is accompanied with the internal use of the mixture of iodine and gold (see ANTISCROFULOUS MIXTURE), this treatment has seldom failed, even when the parties were dieted chiefly on salt food.

b. (Debreyne.) Extract of belladonna and lard, of each, 3 drs.; powdered opium, ½ dr. As an external anodyne and benumber, more especially in neuralgia, painful cancerous tumours, &c. A small piece is to be applied to the part, and the friction continued for 6 or 8 minutes. The above preparations are useless unless the extract employed is recent, and of good quality.

Ointment of Bismuth. *Syn.* UNGUENTUM BISMUTHI, L. *Prep.* 1. Nitrate of bismuth ('white bismuth'), 1 dr.; simple ointment, 1 oz.

2. (Fuller.) Nitrate of bismuth, 1 dr.; spermaceti ointment, 19 drs. In itch, and some chronic cutaneous diseases.

Ointment, Blist'ering. See OINTMENT OF CANTHARIDES, and VESICANTS.

Ointment, Blue. This is the vulgar name in England of mercurial ointment. On the Continent, an ointment made of smalts and Goulard water is commonly so called.

Ointment of Bor''ax. *Syn.* UNGUENTUM BORACIS, L. *Prep.* From borax (in very fine powder), 1 dr.; simple ointment or lard, 7 drs. In excoriations, chaps, &c.

Ointment of Bro'mide of Potas'sium. *Syn.* UNGUENTUM POTASSII BROMIDI, U. POTASSÆ HYDROBROMATIS, L. *Prep.* (Magendie.) Bromide of potassium, ½ dr.; lard, 1 oz. Resolvent; in bronchocele, scrofula, &c.

Ointment of Bro'mine. *Syn.* UNGUENTUM BROMINII, U. B. COMPOSITUM, L. *Prep.* (Magendie.) Bromide of potassium, 20 grs.; bromine, 6 to 12 drops; lard, 1 oz. As the last, but more active.

Ointment, Brown. *Syn.* FRENCH POOR-MAN'S FRIEND; UNGUENTUM FUSCUM, U. HYDRARGYRI, F., L. *Prep.* (P. Cod.) Nitric oxide of mercury (levigated), ½ dr.; resin ointment, 1 oz. In ophthalmia (cautiously), after the inflammatory stage is over; as an application to sore legs, &c.

Ointment of Cad'mium. *Syn.* UNGUENTUM CADMII, U. C. SULPHATIS, L. *Prep.* (Radius.) Sulphate of cadmium, 1 to 2 grs.; pure lard, 1 dr.; carefully triturated together. In specks on the cornea.

Ointment of Cala'mine. *Syn.* UNGUENTUM CALAMINÆ, U. LAPIS CALAMINARIS, U. ZINCI CARBONATIS IMPURI, L. *Prep.* (Ph. D. 1826). Prepared calamine, 1 lb.; ointment of yellow wax, 5 lbs. Desiccative and healing. This is the old Dublin form for Turner's cerate.

Ointment of Cal'omel. *Syn.* UNGUENTUM HYDRARGYRI SUBCHLORIDI (B. P.), UNGUENTUM CALOMELANOS, U. HYDRARGYRI CHLORIDI, L. *Prep.* 1. From calomel, 1 dr.; lard, or simple ointment, 1 oz.

Obs. "Were I required to name a local agent pre-eminently useful in skin diseases generally, I should fix on this. It is well deserving a place in the Pharmacopœia." (Pereira.) Dr. Underwood uses elder-flower ointment as the vehicle.

2. (Compound; UNGUENTUM CALOMELANOS COMPOSITUM—Dr. A. T. Thomson.) Calomel, 1 dr.; tar ointment, 4 drs.; spermaceti ointment, 1 oz.

3. (B. P.). Calomel, 1; prepared lard, 5½; mix. In lepra.

Ointment of Cam'phor. *Syn.* UNGUENTUM CAMPHORÆ, L. *Prep.* 1. Camphor, 1 to 2 drs.; lard, 1 oz.; dissolve by a gentle heat and stir until the mass is nearly cold. Stimulant and anodyne; in prurigo, psoriasis, &c.

2. (Compound.) From powdered opium, ½ dr.; powdered camphor, 1½ dr.; lard, 1½ oz.; mix by trituration, As an anodyne friction in rheumatic pains, swelled joints, colic, &c.

Ointment of Canthar'ides. *Syn.* UNGUENTUM CANTHARIDIS (B. P., Ph. L. D. & U. S.), U. LYTTÆ, L. *Prep.* 1. (Ph. L.) Cantharides (in very fine powder), 3 oz.; distilled water, 12 fl. oz.; mix, boil to one half, to the strained liquid add of resin cerate, 1 lb., and evaporate to a proper consistence.

2. (Ph. D.) Liniment of Spanish flies, 8 fl. oz.; white wax, 3 oz.; spermaceti, 1 oz.; melt together with a gentle heat, and stir until it concretes.

3. (Ph. E.)—*a.* UNGUENTUM INFUSI CANTHARIDIS—Ph. E.) Powdered cantharides, 1 oz.; boiling water, ¼ pint; infuse one night (12 hours), strain with expression, add of lard, 2 oz., and boil until the water is expelled; then add bees' wax and resin, of each, 1 oz.,

and when these are liquefied, remove the vessel from the fire, and further add of Venice turpentine, 2 oz.

b. (UNGUENTUM PULVERIS CANTHARIDIS—Ph. E.) Resin ointment, 7 oz.; melt, add of cantharides (in fine powder), 1 oz., and stir until the whole is nearly cold.

4. (B. P.) Cantharides, in fine powder, 1; olive oil, 6; yellow wax, 1: digest the cantharides in the oil for twelve hours, and for ¼ hour at 212°; strain, add the melted wax, and stir till cold.

Obs. The above preparations are frequently called 'blister ointment' or 'epispastic ointment.' They are *used* to keep blisters open after they have been produced by stronger compounds. The first three compounds are regarded as milder than the last (3, *b*), which contains the flies in substance. The P. Cod. contains an ointment (UNG. EPISPASTICUM FLAVUM) which is weaker than the above, prepared by digesting the bruised flies in lard, for 3 hours, over a warm bath; about ⅙th part of wax is next added to the strained fat, which is then coloured with turmeric, and scented with oil of lemon. See CERATE, POMMADE, VESICANTS, and *below*.

Ointment of Canthar'idine. *Syn.* UNGUENTUM CANTHARIDINÆ, L. *Prep.* (Soubeiran.) Cantharidine, 1 gr.; white wax, 1 dr.; lard, 7 drs.; mix thoroughly. (See *above*.)

Ointment of Cap'sicum. *Syn.* UNGUENTUM CAPSICI, L. *Prep.* (Dr. Turnbull.) Tincture of capsicum (pure), q. s.; gently evaporate it until it begins to gelatinize, then mix the extract with twice its weight of lard. As a powerful stimulant and rubefacient. When very freely used, it vesicates.

Ointment of Car'bonate of Am"monia. See AMMONIACAL OINTMENT.

Ointment of Car'bonate of Lead. *Syn.* WHITE LEAD OINTMENT; UNGUENTUM PLUMBI CARBONATIS (P. B., Ph. E. & D.), U. CERUSSÆ, L. *Prep.* 1. (Ph. E.) Carbonate of lead, 1 oz.; simple ointment, 5 oz.; mix thoroughly.

2. (Ph. D.) Carbonate of lead, 3 oz.; ointment of white wax, 1 lb.; mix with heat.

3. (B. P.) Carbonate of lead, in fine powder, 1; simple ointment, 7: mix.

Uses, &c. Cooling; desiccative. Useful to promote the healing of excoriated parts and slight ulcerations. The camphorated white ointment of old pharmacy (UNG. ALBUM CAMPHORATUM—Ph. L. 1741) was made by adding 40 grs. of camphor to the first of the above.

Ointment of Cat'echu. *Syn.* UNGUENTUM CATECHU, L. *Prep.* From alum, 1 oz.; catechu, 3 oz.; (both in very fine powder;) added to olive oil, ½ pint, and yellow resin, 4 oz., previously melted together. *Used* to dress ulcers in hot climates, where the ordinary fat ointments are objectionable; also in this country during hot weather. See ASTRINGENT OINTMENT.

Ointment of Char'coal. *Syn.* UNGUENTUM CARBONIS, L. *Prep.* 1. Resin ointment, 10 drs.; recently burnt charcoal (levigated), 3 drs. As a dressing to foul ulcers, especially those of the legs.

2. (Caspar.) Lime-tree charcoal and dried carbonate of soda, of each, 2 drs.; rose ointment, 1 oz., or q. s. In scald-head.

3. (Radius.) Animal charcoal (recent), 1 part; mallow ointment, 2 parts. As a friction in glandular enlargements and indurations, as a dressing to fetid ulcers, &c.

Ointment of Cher'ry-Laurel. *Syn.* UNGUENTUM LAURO-CERASI, L. *Prep.* (Soubeiran.) Essential oil of cherry-laurel, 1 dr.; lard, 1 oz. To alleviate the pain in cancer, neuralgia, and other local affections.

Ointment, Chil'blain. *Syn.* UNGUENTUM AD PERNIONES, L. *Prep.* 1. From made mustard (very thick), 2 parts; almond oil and glycerine, of each, 1 part; triturated together. To be applied night and morning.

2. (Cottereau.) Acetate of lead, camphor, and cherry-laurel water, of each, 1 dr.; tar, 1½ dr.; lard, 1 oz.

3. (Devergie.) Creasote and Goulard's extract, of each, 12 drops; extract of opium, 1½ gr.; lard, 1 oz. Twice or thrice daily.

4. (Giacomini). Sugar of lead, 2 drs.; cherry-laurel water (distilled), 2 fl. dr.; lard, 1 oz.

5. (Linnæus.) Balsam of Peru, 1 dr.; hydrochloric acid, 2 drs.; spermaceti ointment, 2½ oz.

Obs. For Swediaur's, Vance's, and Wahler's ointments, see article CHILBLAIN.

Ointment of Chlo"ride of Cal'cium. *Syn.* UNGUENTUM CALCII CHLORIDI, U. CALCIS MURIATIS†, L. *Prep.* (Sundelin.) Chloride of calcium (dry), 1 dr.; strong vinegar, 40 grs.; foxglove (recent, in fine powder), 2 drs.; lard, 1 oz. In bronchocele, scrofulous tumours, &c.

Ointment of Chloride of Lead. *Syn.* UNGUENTUM PLUMBI CHLORIDI, L. *Prep.* (Tuson). Chloride of lead, 1 part; simple cerate, 8 parts; carefully triturated together. In painful cancerous ulcerations and neuralgic tumours. See LEAD (Chloride).

Ointment of Chloride of Lime. See OINTMENT OF HYPOCHLORITE OF LIME.

Ointment of Chloride of Mercury. See OINTMENTS OF CALOMEL and CORROSIVE SUBLIMATE.

Ointment of Chlo"rine. *Syn.* UNGUENTUM CHLORINII, L. *Prep.* (Augustin.) Chlorine water, 1 part; lard, 8 parts; well triturated together. In itch, lepra, ring-worm, fetid ulcers, &c.

Ointment of Chlor-i'odide of Mercury. *Syn.* UNGUENTUM HYDRARGYRI CHLORIODIDI, L. *Prep.* (M. Recamier.) Chloriodide (iodochloride) of mercury, 3 grs.; lard, 5 drs. Recommended as a powerful discutient or resolvent. See OINTMENT OF IODO-CHLORIDE OF MERCURY.

Ointment of Chlo"roform. *Syn.* UNGUENTUM CHLOROFORMI, L. Prep. (M. Louis.) Chlor-form, 1 dr.; simple ointment, 1 oz. In neuralgia and rheumatic pains, &c. It must be kept in a stoppered, wide-mouthed phial.

Ointment of Cin'chona. *Syn.* OINTMENT OF BARK; UNGUENTUM CINCHONÆ, L. *Prep.* (Biett.) Red cinchona bark (in very fine powder) and almond oil, of each, 1 part; beef marrow (prepared), 3 parts. In the variety of scald-head termed porrigo decalvans. A little oil of mace or tar is a useful addition.

Ointment, Cit'rine. See OINTMENT OF NITRATE OF MERCURY.

Ointment of Coc'culus In'dicus. *Syn.* UNGUENTUM COCCULI (Ph. E.), L. *Prep.* (Ph. E.) Kernels of *Cocculus Indicus*, 1 part; beat them to a smooth paste in a mortar, first alone, and next with a little lard; then further add of lard, q. s., so that it may be equal to 5 times the weight of the kernels. *Used* to destroy pediculi, and in scald-head, &c.

Ointment of Cod-liver Oil. *Syn.* UNGUENTUM OLEI MORRHUÆ, U. O. JECORIS ASELLI, L. *Prep.* Cod-liver oil (pale and recent), 7 parts; white wax and spermaceti, of each, 1 part; melted together. In ophthalmia and opacity of the cornea, either alone or combined with a little citrine ointment; as a friction or dressing for scrofulous indurations and sores; in rheumatism, stiff joints, and in several skin diseases. It often succeeds in porrigo or scald-head when all other remedies have failed. Scented with oil of nutmeg and balsam of Peru, it forms an excellent pommade for strengthening and restoring the hair.

Ointment of Col'ocynth. *Syn.* UNGUENTUM COLOCYNTHIDIS, L. *Prep.* (Chrestien.) Colocynth pulp (in very fine powder), 1 part; lard, 8 parts. *Used* in frictions on the abdomen as a hydragogue purgative, in mania, dropsy, &c.

Ointment of Corrosive Sub'limate. *Syn.* OINTMENT OF CHLORIDE OF MERCURY; UNGUENTUM HYDRARGYRI CHLORIDI, L. *Prep.* 1. From corrosive sublimate, 2 to 5 grs.; rub it to powder in a glass or wedgwood-ware mortar; add of rectified spirit, 6 or 7 drops, or q. s.; again triturate; lastly add, gradually, of spermaceti ointment (reduced to a cream-like state by heat), 1 oz., and continue the trituration until the whole concretes. *Used* as a stimulant, detergent, and discutient application in various local affections; in lepra, porrigo, acne, &c., and as a dressing to syphilitic and some other ulcers.

2. (Ph. Chirur.) Corrosive sublimate, 10 grs.; yolk of 1 egg; lard, 1 oz. As a dressing.

3. (POMMADE DE CIRILLO—P. Cod.) Corrosive sublimate, 1 dr.; lard, 1 oz. Caustic; must not be confounded with the preceding.

Ointment, Cosmet'ic. *Syn.* UNGUENTUM COSMETICUM, L.; POMMADE DE LA JEUNESSE, Fr. *Prep.* (Quincey.) Spermaceti, 3 dr. (better, 4½ dr.); oil of almonds, 2 oz.; melt together, and, when cooled a little, stir in of nitrate of bismuth ('white bismuth'), 1 dr.; and, lastly, of oil of rhodium, 6 drops. In itch and some other cutaneous eruptions; but chiefly as a pommade for the hair. Its frequent use is said to turn the latter black.

Ointment of Cre'asote. *Syn.* UNGUENTUM CREASOTI (B. P., Ph. L. E. D. & U. S.), L. *Prep.* 1. (Ph. L.) Creasote, ½ fl. dr.; lard, 1 oz.; triturate together.

2. (Ph. E.) Lard, 3 oz.; melt it by a gentle heat; add of creasote, 1 dr., and stir the mixture until it is nearly cold.

3. (Ph. D.) Creasote, 1 fl. dr.; ointment of white wax, 7 drs.; as the last.

4. (B. P.) Creasote, 1; simple ointment, 8: mix.

Uses, &c. In several skin diseases, especially ring-worm; as a friction in tic-douloureux; a dressing for scalds and burns; an application to chilblains, &c., &c.

Ointment of Cro'ton Oil. *Syn.* UNGUENTUM CROTONIS, L. *Prep.* 1. Croton oil, 15 to 30 drops; lard (softened by heat), 1 oz.; mix well. This is the usual and most useful strength to prepare the ointment. Rubefacient and counter-irritant; in rheumatism and various other diseases. When rubbed repeatedly on the skin, it produces redness and a pustular eruption. It also often affects the bowels by absorption. The only advantage it possesses over other preparations of the class is the rapidity of its action.

2. (RUBEFACIENT POMMADE—Caventou.) White wax, 1 part; lard, 5 parts; melt together, and, when quite cold, mince it small, add of croton oil, 2 parts, and mix by trituration. Stronger than the last.

Ointment of Cy'anide of Mer'cury. *Syn.* UNGUENTUM HYDRARGYRI CYANIDI, L. *Prep.* 1. (Cazenave.) Cyanide of mercury, 8 grs.; lard, 1 oz.; carefully triturated together.

2. (Pereira.) Cyanide of mercury, 10 to 12 grs.; lard, 1 oz. As a dressing for scrofulous and syphilitic ulcers, &c.; as an application in psoriasis, moist tetters, and some other skin diseases, &c. Biett orders the addition of a few drops of essence of lemon.

Ointment of Cyanide of Potas'sium. *Syn.* UNGUENTUM POTASSII CYANIDI, L. *Prep.* (Cazenave.) Cyanide of potassium, 12 grs.; oil of almonds, 2 drs.; triturate, add of cold cream (dry), 2 oz., and mix by careful trituration. As an anodyne in neuralgia, rheumatism, swelled joints, &c.; also as a friction over the spine in hysteria, and over the epigastrium in gastrodynia, &c.

Ointment of Delphin'ine. *Syn.* UNGUENTUM DELPHINIÆ, L. *Prep.* (Dr. Turnbull.) Delphinine or delphinia, 10 to 30 grs.; olive oil, 1 dr.; lard, 1 oz.; mix as the last. *Used* as a friction in rheumatism, and the other cases in which veratrine is employed.

Ointment, Depil'atory. *Syn.* UNGUENTUM DEPILATORIUM, L. See DEPILATORY (Cazenave's).

Ointment, Desic'cative. *Syn.* DRYING OINTMENT; UNGUENTUM DESICCATIVUM, U. EX-

SICCANS, L. See the OINTMENTS OF CALAMINE, LEAD, ZINC, &c.

Ointment, Deter'gent. *Syn.* UNGUENTUM DETERGENS, L. The OINTMENTS OF NITRATE OF MERCURY, NITRIC OXIDE OF MERCURY, TAR, VERDIGRIS, &c., when not too strong, come under this head.

Ointment, Diges'tive. *Syn.* UNGUENTUM DIGESTIVUM, L. *Prep.* 1. (P. Cod.) Venice turpentine, 2 oz.; yolks of 2 eggs; mix, and add of oil of St. John's wort, ½ oz.

2. (DIGESTIF ANIMÉ—P. Cod.) As the last, with an equal weight of liquid styrax.

3. (DIGESTIF MERCURIEL—P. Cod.) As No. 1, with an equal weight of mercurial ointment.

4. (UNG. D. VIRIDE—Dr. Kirkland.) Bees' wax, gum elemi, and yellow resin, of each, 1 oz.; green oil, 6 oz.; melt them together, and, when considerably cooled, add of oil of turpentine, 2 drs.

Ointment, Edinburgh. Two compounds are known under this name:—1. (BROWN.) From black basilicon, 6 parts; milk of sulphur, 2 parts; sal ammoniac, 1 part.

2. (WHITE.) From white hellebore, 3 oz.; sal ammoniac, 2 oz.; lard, 1 lb. Both are used in itch.

Ointment of Eggs. *Syn.* UNGUENTUM OVORUM, L. *Prep.* 1. Yolk of 1 egg; honey and fresh linseed oil, of each, 1 oz.; balsam of Peru, ½ dr.; mix well.

2. (Soubeiran.) Bees' wax, 4 drs.; oil of almonds, 1½ oz.; yolk of 1 egg. As an emollient and soothing dressing to excoriations, irritable ulcers, &c.

Ointment, Egyp'tian. *Prep.* (Giordano.) Burnt alum, 1 part; verdigris, 10 parts; strong vinegar, 14 parts; purified honey (thick), 32 parts; mix by heat and agitation. As a detergent application to foul ulcers. It is a modification of the 'UNGUENTUM ÆGYPTIACUM' of old pharmacy.

Ointment of Elder flowers. *Syn.* WHITE ELDER-OINTMENT; UNGUENTUM SAMBUCI FLORUM, U. SAMBUCI (Ph. L.), L. *Prep.* 1. (Ph. L.) Elder flowers and lard, of each, 1 lb.; boil them together until the flowers become crisp, then strain, with pressure, through a linen cloth. The same precautions must be observed as are necessary in the preparation of the medicated oils, by infusion. Emollient; less white and odorous than the following:—

2. (Wholesale.) Take of lard (hard, white, and sweet), 25 lbs.; prepared mutton suet, 5 lbs.; melt them in a well-tinned copper or earthen vessel, add of elder-flower water, 3 galls., agitate briskly for about ½ an hour, and set it aside; the next day gently pour off the water, re-melt the ointment, and add of benzoic acid, 5 drs.; otto of roses, 20 drops; oil of bergamot and oil of rosemary, of each, 1 dr.; again agitate well, let it settle for 10 minutes, and then pour off the clear portion into pots for sale. Very agreeable, and keeps well.

Obs. The last formula is the one now generally adopted by the large wholesale houses.

Ointment of Elder leaf. *Syn.* ELDER OINTMENT, GREEN E. O.; UNGUENTUM VIRIDE, U. SAMBUCI VIRIDE, U. SAMBUCI (Ph. D. 1826), L. *Prep.* 1. (Ph. D. 1826.) Fresh elder leaves (bruised), 3lbs.; suet, 4 lbs.; lard, 2 lbs.; boil together, as above.

2. (Wholesale.) Good fresh lard, 1 cwt., fresh elder leaves, 56 lbs.; boil till crisp, strain off the oil, put it over a slow fire, add hard prepared mutton-suet, 14 lbs., and gently stir it until it acquires a bright green colour.

Obs. The above ointment is reputed to be emollient and cooling, and has always been a great favourite with the common people. Both elder-flower and elder-leaf ointment are, however, unnecessary preparations. "They are vestiges of the redundant practice of former times." (A. T. Thomson.) The above formulæ are those now almost exclusively employed in trade. The ointment should be allowed to cool very slowly, and after its temperature has fallen a little, and it begins to thicken, it should not be stirred, in order that it may 'grain' well, as a granular appearance is much admired. It is a common practice to add powdered verdigris to deeper the colour, but then the ointment does not keep well. This dangerous fraud may be detected in the manner noticed under SAVINE CERATE (*page* 314).

Ointment of El'emi. *Syn.* BALSAM OF ARCÆUS†, UNGUENTUM ELEMI (B. P., Ph. L. & D.), L. *Prep.* 1. (Ph. L.) Elemi, 3 oz.; suet, 6 oz.; melt them together, remove the vessel from the fire, and stir in of common turpentine, 2½ oz.; olive oil, ½ fl. oz.; lastly, strain the whole through a linen cloth.

2. (Ph. D.) Resin of elemi, 4 oz.; ointment of white wax, 1 lb.; melt them together, strain through flannel, and stir the mixture constantly until it concretes.

3. (B. P.) Elemi, 1; simple ointment, 4; melt and strain.

Uses, &c. Stimulant and digestive. It is frequently employed to keep open issues and setons, and as a dressing for old and ill-conditioned sores. The 'UNG. ELEMI CUM ÆRUGINE' of St. George's Hospital is made by adding 1 dr. of finely powdered verdigris to every 6 oz. of the ointment.

Ointment, Escharot'ic. *Syn.* UNGUENTUM ESCHAROTICUM, L. *Prep.* 1. (Sir B. Brodie.) Corrosive sublimate, 1 dr,; nitric oxide of mercury, sulphate of copper, and verdigris, of each, 2 drs. (all in very fine powder); lard, q. s. See ARSENICAL OINTMENT and CERATE.

Ointment, Eye. *Syn.* EYE SALVE; UNGUENTUM OPHTHALMICUM, L. *Prep.* 1. (Dr. Collier.) Burnt alum, ½ dr.; powdered opium, 20 grs.; olive oil, 1 fl. dr.; spermaceti ointment, 2 drs. In inflammation of the eyelids, purulent ophthalmia, &c.

2. (W. Cooley.) Chloride of barium, 6 grs.; calomel, 10 grs.; simple ointment, 1 oz.; otto

of roses, 1 or 2 drops. In scrofulous ophthalmia.

3. (Dessault.) Nitric oxide of mercury, carbonate of zinc, acetate of lead, and dried alum, of each, 1 dr.; corrosive sublimate, 10 grs.; rose ointment, 1 oz. In chronic ophthalmia, profuse discharges, &c.; in general, diluted.

4. (Dupuytren.) Red oxide of mercury, 10 grs.; sulphate of zinc, 20 grs.; lard, 2 oz. For chronic inflammation of the eyelids, chronic ulcers, &c.

5. (Fricke.) Nitrate of silver, 10 grs.; zinc ointment, 2 drs.; balsam of Peru, ½ dr. In ulceration of the cornea, and in acute, purulent, and chronic ophthalmia, &c., employing great caution in its use.

6. (Guthrie.) Spermaceti ointment, 1 dr.; solution of diacetate of lead, 15 drops; nitrate of silver, 2 to 10 grs. As the last, and in cases wherein a direct caustic action is desired. The stronger ointment often occasions intense pain.

7. (Hufeland.) Black oxide of mercury, 2 grs.; spermaceti cerate and walnut oil, of each, 1 dr. In chronic affections of the eyes or eyelids, particularly in those of a syphilitic character.

8. (Janin.) Ammonio-chloride of mercury, 1 dr.; tutty and bole, of each, 2 drs.; lard, 1 oz. In debility of the conjunctiva, in chronic inflammation with excessive secretion, &c.

9. (Marshall.) See CERATE (Marshall's).

10. (Parker.) Iodine, 1 gr.; iodide of potassium, 5 grs.; simple ointment, 3 drs. In scrofulous ophthalmia, thickening of the conjunctiva, opacity of the cornea, &c.

11. (Pellier.) Nitric oxide of mercury and carbonate of zinc, of each, 1½ dr.; tutty, ½ dr.; red sulphuret of mercury, 20 grs.; lard, 2 oz.; balsam of Peru, 15 drops. In specks in the eye arising from small ulcers which have healed up; in excessive defluxions, &c.

12. (Ratier.) Liquor of diacetate of lead, ½ dr.; wine of opium, 1 dr.; lard, 5 drs. In excoriations, and the variety of chronic ophthalmia popularly termed 'blear eye.'

13. (Regent.) Acetate of lead and red precipitate, of each, 1 dr.; camphor, 6 grs.; washed fresh butter, 2½ oz. As the last, and in chronic ulcerations.

14. (Singleton's GOLDEN OINTMENT.) According to Dr. Paris, this compound consists of lard medicated with orpiment (native yellow sulphuret of arsenic). There appears, however, to be some mistake in this, as that sold us under the name had nearly the same composition as the OINTMENT OF NITRIC OXIDE OF MERCURY of the Pharmacopœia. It did not contain even a trace of either arsenic or sulphur. The action of this nostrum, and the reputation which it has acquired, fully justify this conclusion.

15. (Smellome.) From verdigris (levigated), ½ dr.; olive oil, 1 fl. dr.; triturate together, add of yellow basilicon, 1 oz., and again triturate until it begins to concrete. A popular nostrum, sometimes useful in chronic inflammation and ulcerations of the eyelids, &c., especially in those of a scrofulous character.

16. (Spielmann.) Acetate of lead, 20 grs.; spermaceti cerate, 5 drs.; compound tincture of benzoin, 40 grs. Cooling; dessicative. In inflamed eyelids, excoriations, &c.

17. (St. Yve.) Fresh butter (washed), 1 oz.; white wax, 1 dr.; camphor, 15 grs.; melt by a gentle heat, and, when cooled a little, add of red precipitate (levigated), ½ dr.; oxide of zinc, 20 grs. In chronic inflammation of the coats of the eye, or of the eyelids, specks on the cornea, &c.

18. (Thomson.) Levigated oxide of zinc, 1 dr.; lard, 9 drs.; wine of opium, 20 drops. In chronic ophthalmia depending on want of tone in the vessels and integuments of the eye.

19. (Velpeau.) Precipitated sesquioxide of iron (recent, but dry), ½ dr.; lard, 5 drs.; oil of almonds, 1 fl. dr.; balsam of Peru, 15 drops. As the last, especially in 'blear eye.'

20. (Ware.) Wine of opium, 1 fl. dr.; simple ointment, 3 drs. In ophthalmia, after the inflammatory symptoms have subsided, and the vessels remain red and turgid.

Obs. The ingredients entering into the composition of all the above ointments must be reduced to the state of impalpable powder before mixing them; and the incorporation should be made by long trituration in a wedgwood-ware mortar, or, preferably, for those that contain substances that are very gritty, by levigation on a porphyry slab, with a muller. The most serious consequences, even blindness, have resulted from the neglect of these precautions. They should all be employed in exceedingly small quantities at a time, and they should be very carefully applied by means of a camel-hair pencil or a feather; and, in general, not until acute inflammation has subsided. The stronger ones, in most cases, require dilution with an equal weight to twice their weight of lard or simple ointment, and should only be used of their full strength under proper medical advice. Various other formulæ for OPHTHALMIC OINTMENTS will be found under the names of their leading ingredients.

Ointment of Fig'wort. See OINTMENT OF SCROPHULARIA.

Ointment of Fox'glove. *Syn.* UNGUENTUM DIGITALIS, L. *Prep.* 1. From fresh foxglove, as ointment of hemlock—Ph, L. As an application to chronic ulcers, glandular swellings, &c.

2. (Rademacher.) Extract of foxglove, 2 drs.; lard, 1 oz. In croup; spread on lint, and applied as a plaster to the throat.

Ointment of Fu'ligoka'li. See FULIGOKALI.

Ointment of Galls. *Syn.* UNGUENTUM GALLÆ (B. P., Ph. D.), L. *Prep.* 1. (Ph. D.) Gall-nuts (in very fine powder), 1 dr.; ointment of white wax, 7 drs.; rub them together until a uniform mixture is obtained.

2. (B. P.) Galls, in very fine powder, 80 grs.; benzoated lard, 1 oz.; mix. An excellent application to piles, either alone or mixed with an equal quantity of zinc ointment; also highly useful in ring-worm of the scalp.

Ointment of Galls and Opium. UNGUENTUM GALLÆ CUM OPIO (B. P.); UNGUENTUM GALLÆ OPIATUM, U. GALLÆ COMPOSITUM —Ph. L., U. GALLÆ ET OPII,—(Ph. E.)—*Prep.* 1. (Ph. L.) Gall-nuts (very finely powdered), 6 drs.; powdered opium, 1½ dr.; lard, 6 oz.; rub them together.

2. (Ph. E.) Galls, 2 drs.; opium, 1 dr.; lard, 1 oz.; as the last.

3. (B. P.) Ointment of galls, 1 oz.; opium (in powder), 32 grs.; mix.

Uses, &c. A most valuable astringent and anodyne in blind piles, slight cases of prolapsus ani, &c. Some practitioners add 1 dr. of camphor. The ointment of the Ph. E. is much the strongest.

OINTMENT OF GALLS WITH MORPHIA. UNGUENTUM GALLÆ ET MORPHIÆ—Dr. Paris.) Morphia, 2 grs.; olive oil (hot), 2 fl. drs.; triturate, add of zinc ointment (Ph. L.), 1 oz.; powdered galls, 1 dr.; and mix thoroughly. In piles. The quantity of galls should be doubled.

Ointment of Garlic. *Syn.* UNGUENTUM ALLII, L. *Prep.* 1. Fresh garlic (bruised), 2 parts; lard, 3 parts; simmer together for ½ an hour, and then strain with expression. Rubbed on the abdomen in chronic diarrhœa and colic, and over the chest and spine in hooping-cough.

2. (Beasley.) Fresh garlic and lard, equal parts; beaten together. Applied to the feet in hooping-cough.

Ointment, Giacomini's. See CHILBLAIN OINTMENT.

Ointment of Gold. *Syn.* UNGUENTUM AURI, L.; POMMADE D'OR, Fr. *Prep.* 1. (Legrand.) Gold (in powder), 12 grs.; lard, 1 oz. As a dressing for syphilitic ulcers, and as a friction in glandular indurations, &c.; also endermically.

2. (Magendie.) Amalgam of gold, 1 dr.; lard, 1 oz. For endermic use, chiefly. When the surface becomes dry, the ointment of terchloride of gold is to be substituted as a dressing. In rheumatic pains, neuralgia, &c.

Ointment, Gold'en. See EYE OINTMENT, CITRINE O., &c.

Ointment, Gondret's. See AMMONIACAL OINTMENT.

Ointment, Goulard's. *Syn.* UNGUENTUM GOULARDI, U. LITHARGYRI ACETATIS, L. *Prep.* (Ph. Chirur.) Goulard's extract, 1 dr.; simple ointment, 2 oz. See CERATE (Lead).

Ointment Green. See ELDER OINTMENT.

Ointment of Hel'lebore. *Syn.* OINTMENT OF WHITE HELLEBORE; UNGUENTUM VERATRI, L. *Prep.* 1. (Ph. L. 1836.) White hellebore (in very fine powder), 2 oz.; lard, 8 oz.; oil of lemons, 20 drops. In itch, lepra, ring-worm, &c.; and to destroy insects in the hair of children. It should be used with caution, and, preferably, diluted with an equal weight of lard.

2. (Compound; UNGUENTUM VERATRI COMPOSITUM.)—*a.* (Rayer.) White hellebore, 1 oz.; sal ammoniac, ½ oz.; lard, 8 oz. *Used* as the last.

b. See SULPHUR OINTMENT (Compound)—Ph. L.

Ointment of Hem'lock. *Syn.* UNGUENTUM CONII (Ph. L.), L. *Prep.* 1. (Ph. L.) Fresh hemlock leaves and lard, of each, 1 lb.; boil them together (very gently) until the leaves become crisp, then strain through linen, with pressure. See OILS (Medicated.)

2. Extract of hemlock, 1 dr.; lard, 9 drs.; triturate together.

Uses, &c. As a local anodyne in neuralgic and rheumatic pains, glandular enlargements, painful piles, &c.; and as a dressing to painful and irritable ulcers, cancerous sores, &c.

Ointment of Hen'bane. *Syn.* UNGUENTUM HYOSCYAMI, L. *Prep.* 1. Fresh henbane leaves, 1 lb.; lard, 2 lbs.; boil until nearly crisp.

2. (Taddei.) Extract of henbane, 1 dr.; lard, 1 oz. Anodyne; in painful piles, sores, &c., as the last.

Ointment, Holloway's. See PATENT MEDICINES.

Ointment of Hops. *Syn.* UNGUENTUM LUPULI, L. *Prep.* (Swediaur.) Hops (commercial), 2 oz.; lard, 10 oz.; as extract of hemlock, Ph. L. In painful piles and cancerous sores.

Ointment of Hydri'odate of Ammo"nia. *Syn.* UNGUENTUM AMMONIÆ HYDRIODATIS, L. *Prep.* From hydriodate of ammonia (iodide of ammonium), ½ dr.; simple ointment, 1 oz. *Used* chiefly as an applicatien to scrofulous tumour and ulcers, in irritable subjects.

Ointment of Hydrochlo"ric Acid. *Syn.* UNGUENTUM ACIDI HYDROCHLORICI, L. *Prep.* (Dr. Corrigan.) Hydrochloric acid, 1 dr.; simple ointment, 1 oz. As a dressing for scald-head, after the scabs have been removed by emollient liniments or poultices.

Ointment of Hypochlo"rite of Lime. *Syn.* OINTMENT OF CHLORIDE OF LIME; UNGUENTUM CALCIS HYPOCHLORITIS, U. C. CHLORINATÆ, L. *Prep.* 1. From chlorinated lime (chloride of lime), 1 dr.; lard, 1 oz.; carefully triturated together. In scrofulous swellings, goitre, chilblains, indolent glandular tumours, &c.

2. Chlorinated lime, 1 dr.; powdered foxglove, 2 drs.; simple ointment, 2 oz. As an application to fetid and malignant ulcers, &c.

Ointment of Hypochlo"rite of Sul'phur. *Syn.* UNGUENTUM SULPHURIS HYPOCHLORITIS, L. *Prep.* (Dr. Copland.) 'Hypochlorite of sulphur,' 1 dr.; simple ointment, 1 oz. It is generally scented with oil of almonds. *Used* in psoriasis inveterata, and some other skin diseases.

Ointment of I'odide of Ar'senic. *Syn.* UN-

GUENTUM ARSENICI IODIDI, L. *Prep.* (Biett.) Iodide of arsenic, 2 to 3 grs.; lard, 1 oz.; carefully triturated together. In lepra, psoriasis, &c.; and in corroding tubercular diseases. It should be used with caution, and not more than ¼ dr. applied at once.

Ointment of Iodide of Ba″rium. *Syn.* UNGUENTUM BARII IODIDE, L. *Prep.* (Magendie.) Iodide of barium, 3 to 4 grs.; lard, 1 oz. As a friction to scrofulous swellings and indurations. The usual proportions are now 5 gr. to the oz.

Ointment of Iodide of Lead. *Syn.* UNGUENTUM PLUMBI IODIDI (B. P., Ph. L. & D.), L. *Prep.* 1. (Ph. L.) Iodide of lead, 1 oz.; lard, 8 oz.; rub them together.

2. (Ph. D.) Iodide of lead (in fine powder), 1 dr.; ointment of white wax, 7 drs.

3. (B. P.) Iodide of lead, in fine powder, 62 grs.; simple ointment, 1 oz.; mix. An excellent application to scrofulous tumours and swelled glands, especially when accompanied with pain.

Ointment of Green Iodide of Mer′cury. *Prep.* 1. (OINTMENT OF SUBIODIDE OF MERCURY, O. OF PROTIODIDE OF M.*; UNGUENTUM HYDRARGYRI IODIDI—Ph. L.) *a.* (Ph. L. White wax, 2 oz.; lard, 6 oz.; melt them together, add of iodide (green iodide) of mercury, 1 oz., and rub them well together.

2. (Magendie.) Green iodide of mercury, 23 grs.; lard, 1½ oz.

Uses, &c. In tubercular skin diseases, as a friction in scrofulous swellings and indolent granular tumours, and as a dressing for ill-conditioned ulcers, especially those of a scrofulous character.

Ointment of Red Iodide of Mercury. UNGUENTUM HYDRARGYRI IODIDI RUBRI, B. P., O. OF BINIODIDE OF M.*; UNGUENTUM HYDRARGYRI BINIODIDI,* U. H. IODIDI RUBRI—Ph. D.)—1. (Ph. D.) Red iodide of mercury, 1 dr.; ointment of white wax, 7 drs.; mix by careful trituration.

2. (Soubeiran.) Red iodide of mercury, 20 grs.; lard, 1½ oz.

3. (B. P.) Red iodide of mercury (in very fine powder), 16 grs.; simple ointment, 1 oz.; mix.

Uses, &c. Similar to those of the preceding, but it is much more stimulant, and is regarded as better adapted for obstinate syphilitic sores. Largely diluted with lard or almond oil, it is applied to the eyes in like cases.

Ointment of Iodide of Potas′sium. *Syn.* UNGUENTUM POTASSII IODIDI (B. P., Ph. L. & D.). L. *Prep.* 1. (Ph. L.) Iodide of potassium, 2 drs., dissolved in boiling distilled water, 2 fl. drs.; lard (softened by heat), 2 oz.; triturate together until united.

2. (Ph. D.) Iodide of potassium, 1 dr.; distilled water, ½ fl. dr.; ointment of white wax, 7 drs.; as before.

3. (Magendie.) Iodide of potassium, 1 dr.; lard, 12 drs.

4. (Le Gros.) Iodide, ½ dr.; lard, 1 oz.

5. (B. P.) Iodide of potassium, 64 grs.; carbonate of potash, 4 grs.; distilled water, 1 dr.; prepared lard, 1 oz.; dissolve the carbonate and the iodide in the water, and mix thoroughly with the lard.

Uses, &c. As a friction in scrofula, bronchocele, glandular enlargements, indurations, &c.; as a dressing to scrofulous ulcers, as an application in scrofulous ophthalmia, and in most of the other applications in which the employment of iodine is indicated. The last formula has been successfully employed by M. Le Gros in itch.

Obs. The strength of this ointment, as prescribed by different parties, varies greatly, the proportions of the iodide ranging from $\frac{1}{32}$ to ⅛ of the whole, to adapt it to particular cases. When other ingredients are added, the iodide must be used in a perfectly dry state, and in fine powder, instead of being dissolved in water. This is particularly necessary when it is to be mixed with mercurial ointment.

Ointment of Iodide of Sulphur. *Syn.* UNGUENTUM SULPHURIS IODIDI (B. P., Ph. L., L. *Prep.* 1. (Ph. L.) Iodide of sulphur (in fine powder, ½ dr.; lard, 1 oz.; mix by trituration.

2. (Cazenave.) Iodide of sulphur, 12 to 15 grs.; lard, 1 oz.

3. (B. P.) Iodide of sulphur, 1; lard, 16; mix.

Uses, &c. As a local stimulant and alterative, in the chronic forms of lepra, lupus, porrigo, psoriasis, itch, &c.; also a remedy for acne punctata. A few drops of oil of cloves or nutmeg are commonly added.

Ointment of Iodide of Zinc. *Syn.* UNGUENTUM ZINCI IODIDI, L. *Prep.* 1. From iodide of zinc, 12 grs.; simple ointment, 1 oz. In scrofulous excoriations, and in the chronic ophthalmia of scrofulous subjects, arising from a relaxed state of the tissues and vessels.

2. (Dr. Ure.) Iodide of zinc, 1 dr.; lard, 1 oz. As a friction to glandular tumours and indurations, and as a dressing to flabby and obstinate scrofulous ulcers.

Ointment of I′odine. *Syn.* UNGUENTUM IODI (B. P.), UNGUENTUM IODINII (Ph. U. S.). *Prep.* 1.—(B. P.) Iodine, 32 grs.; iodide of potassium, 32 grs.; proof spirit, 1 dr.; rub together and add prepared lard, 2 oz. See OINTMENT OF IODINE (Compound).

2. (Ph. U. S.) Iodine, 20 grs.; rectified spirit, 20 drops; rub them together, then add of lard, 1 oz.

Ointment of Iodine (Compound). *Syn.* OINTMENT OF IODURETTED IODIDE OF POTASSIUM; UNGUENTUM POTASSII IODIDI IODURETUM, U. IODINII COMPOSITUM— Ph. L. & D., U. IODINII—Ph. E.—*a.* (Ph. L.) Iodine of potassium (in very fine powder), 1 dr.; lard, 2 oz.; mix, then add of iodine, ½ dr., dissolved in rectified spirit, 1 fl. dr., and mix all together. See OINTMENT OF IODINE (B. P.)

b. (Ph. E.) Iodine, 1 dr.; iodide of potassium, 2 drs.; rub them together, then gradually add of lard, 4 oz.

c. (Ph. D.) Pure iodine, ½ dr.; iodide of potassium, 1 dr.; rub them well together in a glass or porcelain mortar, then gradually add of ointment of white wax, 14½ drs., and continue the trituration until a uniform ointment is obtained.

Uses, &c. The compound ointment is an excellent friction in goitre, and in enlarged or indurated glands or tumours, more especially those of a scrofulous character; in the quantity of ½ to 1 dr., night and morning. It may be advantageously combined with extract of belladonna in the incipient bubo of scrofulous subjects, and in the early stages of cancer; and, with an equal weight of mercurial ointment, as a friction in cases of enlarged liver and spleen, and ovarian dropsy. The simple ointment of the Ph. U. S. is generally regarded as weaker and less efficacious than the compound.

Ointment of Iodo-chlo″ride of Mercury. *Syn.* UNGUENTUM HYDRARGYRI IODO-BICHLORIDI*, L. *Prep.* From iodo-chloride of mercury, 16 grs.; simple ointment, 1 oz. Discutient; probably one of the most powerful known in syphilitic cases complicated with scrofula. See OINTMENT OF CHLORIODIDE OF MERCURY.

Ointment of Iodo-hydrar′gyrate of Potassa. *Syn.* UNGUENTUM POTASSÆ IODO-HYDRARGYRATIS, L. *Prep.* 1. (Lamothe.) Iodo-hydrargyrate of potassa, 20 grs.; lard, 1 oz.

2. (Puche.) Red iodide of mercury and iodide of potassium, of each, 8 grs.; lard, 1 oz. As a powerful stimulant discutient; in tumours, inflammatory sore throat, &c.

Ointment, Iodo-narcot′ic. *Syn.* UNGUENTUM IODO-NARCOTICUM, L. *Prep.* (Purvis.) Iodine, 20 grs.; iodide of potassium, 2 drs.; oil of tobacco (by infusion), 1½ dr.; lard, 3 drs. To relax rigid muscles.

Ointment of Ipecacuan′ha. *Syn.* UNGUENTUM IPECACUANHÆ, L. *Prep.* (Dr. Turnbull.) Ipecacuanha (in fine powder), 2 drs.; olive oil, 2 fl. drs.; lard or simple ointment, 4 drs. Counter-irritant; when frequently employed as a friction, it occasions an eruption, but one of a milder character than that from either croton oil or tartar emetic.

Ointment, Is′sue. *Syn.* UNGUENTUM AD FONTICULOS, L. *Prep.* (Golding Bird.) Ointment of cantharides (Ph. L.), 1½ oz.; tartar emetic (in impalpable powder), 8 grs.; spermaceti ointment, 2 oz. As a stimulating application to issues, to promote the discharge. See ELEMI OINTMENT, CERATE, PLASTER, &c.

Ointment, Itch. *Syn.* UNGUENTUM ANTIPSORICUM, L. Several excellent formulæ for itch ointments will be found under the names of their leading ingredients. The following are additional ones, including some nostrums:—

1. (Bailey.) From alum, nitre, and sulphate of zinc, of each, in very fine powder, 1¼ oz.; vermilion, ½ oz.; mix, add gradually of sweet oil, ¼ pint; triturate together until perfectly mixed, then further add of lard (softened by heat), 1 lb., with oils of aniseed, lavender, and origanum, q. s. to perfume.

2. (Bateman.) Carbonate of potassa, ½ oz.; rose water, 1 fl. oz.; red sulphuret of mercury, 1 dr.; oil of bergamot, ½ fl. dr.; sublimed sulphur and hog's lard, of each, 11 oz.; mix them. (Bateman, 'Cutan. Diseases.') The nostrum vended under the name is made as follows:—Carbonate of potash, 1 oz.; vermilion, 3 drs.; sulphur, 1 lb.; lard, 1½ lb.; rose water, 3 fl. oz.; oil of bergamot, 1½ dr.

3. (French Hosp.) Chloride of lime, 1 dr.; rectified spirit, 2 fl. drs.; sweet oil, ½ fl. oz.; common salt and sulphur, of each, 1 oz.; soft soap, 2 oz.; oil of lemon, 20 drops. Cheap, effectual, and inoffensive.

4. (De La Harpe.) Sulphur, 2 oz.; powdered white hellebore, ½ oz.; sulphate of zinc, ¼ do.; soft soap, 4 oz.; lard, 8 oz.

5. (Jackson.) From palm oil, flowers of sulphur, and white hellebore, of each, 1 part; lard, 2 parts.

6. (Nugent.) From white lead, 2 oz.; orris root, 1 oz.; corrosive sublimate, in very fine powder, ½ oz.; palm oil, 4 oz.; lard, 1½ lb.

7. (Ph. E. 1744.) Elecampane root and sharp-pointed dock (*Rumex acutus*—Linn.), of each, bruised, 3 oz.; water, 1 quart; vinegar, ¾ pint; boil to one half, add of water-cress, 10 oz.; lard, 4 lbs.; boil to dryness, and strain with expression; to the strained liquid add of bees' wax and oil of bays, of each, 4 oz.; and stir the mixture until nearly cold.

8. (UNG. A. COMP.—Ph. E. 1744.) To each lb. of the last, add of strong mercurial ointment, 2 oz.

9. (Robertson.) Soft soap, 1 oz.; rum, 1 table-spoonful; chloride of lime (dry and good), ¼ oz.; mix, and add of lard, 2 oz.

10. (Swediaur.) Stavesacre (in powder), 1 oz.; lard, 3 oz.; digest with heat for 3 hours, and then strain. The formula of the Ph. Bruns. is nearly similar. Very useful in itch; also to destroy pediculi.

11. (Thomson.) Chloride of lime and common salt, of each, in fine powder, 1 dr.; soft soap, 1 oz.; rectified spirit, 2 fl. drs.; mix, add of lard, 1 oz.; and, lastly, of strong vinegar, 3 fl. drs. Very cleanly and effective; but should not be made in quantity, as it does not keep well.

12. (Voght.) Chloride of lime (dry), 2 drs.; burnt alum, 3 drs.; lard, 9 drs. To be mixed with an equal quantity of soft soap at the time of fusing it.

Obs. The products of the preceding formulæ are used by well rubbing them into the part affected, night and morning, as long as necessary, the number of applications required depending greatly on the manner in which this is done.

Ointment of I′vy. *Syn.* UNGUENTUM HEDERÆ, L. *Prep.* From the leaves of common ivy, by infusion, as ointment of henbane. Used as an application to soft corns, in itch, and as a dressing to indolent ulcers and issues.

Ointment of Ju″niper-tar. *Syn.* UNGUENTUM OLEI PYROLIGNI JUNIPERI, U. CADINUM, L. *Prep.* (Eras. Wilson.) Lard and suet, of each, 6 parts; bees' wax, 4 parts; liquefy by heat, and add of pyroligneous oil of juniper ('huile de cade') 16 parts; with a few drops of any fragrant essential oil, to conceal the smell. In ring-worm, and as a stimulant ointment in some other skin diseases.

Ointment, Kirkland's. See LEAD OINTMENT (Compound).

Ointment of Lard. *Syn.* UNGUENTUM ADIPIS, L. *Prep.* (Ph. L. 1788.) Prepared lard, 2 lbs.; melt, add of rose water, 3 fl. oz.; beat the two well together, then set the vessel aside, and when the whole is cold, separate the congealed fat. A simple emollient. See ELDER OINTMENT.

Ointment of Lau'rel. *Syn.* LAURINE OINTMENT; UNGUENTUM LAURINUM, U. LAURI NOBILIS, L. *Prep.* 1. (Ph. Lusit.) Suet (softened by heat), 8 oz.; laurel oil (expressed oil of bay), 1 lb.; oil of turpentine, 1½ oz. This is the 'nervine balsam' and 'nervine ointment' of the shops in the Peninsula, and in some other parts of Southern Europe. The Ph. Bat. 1805 added ½ oz. of rectified oil of amber.

2. (P. Cod.) Fresh bay leaves and berries (bruised), of each, 1 lb.; lard, 2 lbs.; as hemlock ointment—Ph. L. Highly esteemed on the Continent as a stimulating friction, in bruises, strains, stiff joints, &c.; and in deafness.

3. (Trade.) From fresh bay leaves, 2 lbs.; bay berries, 1 lb.; neat's-foot oil, 5 pints; boil as last; to the strained oil add, of lard suet, 3 lbs., true oil of bay, ¼ lb., and allow it to cool very slowly, in order that it may 'grain' well. Sold for laurel ointment and common oil of bay.

Ointment of Lead. *Prep.* 1. (UNGUENTUM PLUMBI, U. LITHARGYRI—P. Cod.) *Prep.* 1. Litharge, 3 oz.; distilled vinegar, 4 oz.; olive oil, 9 oz.; mix with heat, and stir until they combine. Camphor, morphia, and opium, are common additions to lead ointment, when an anodyne effect is desirable.

2. (Compound; NEUTRAL OINTMENT, HIGGIN'S O., KIRKLAND'S O.; UNGUENTUM NEUTRALE, U. PLUMBI COMPOSITUM — Ph. L.) Lead plaster, 2 lbs.; olive oil, 18 fl. oz.; mix by a gentle heat, and add of prepared chalk, 6 oz.; lastly, add of dilute acetic acid, 6 fl. oz., and stir well until the mass has cooled. As a dressing in indolent ulcers, "but its utility is doubtful." (Dr. Garrod.)

Obs. It will be observed that the College has already modified the old formula of this ointment. The vinegar is now the last ingredient added to the mass. "Gradually add the chalk, separately mixed with the vinegar, the effervescence being finished, and stir," &c. (Ph. L. 1836.) See ACETATE OF LEAD, CARBONATE OF L., CHLORIDE OF L., IODIDE OF L.; EYE, GOULARD'S, LE MORT'S, and other OINTMENTS containing lead.

Ointment, Le Mort's. Carbonate of lead, corrosive sublimate, litharge, and Venice turpentine, of each, 1 oz.; alum, ½ oz.; lard, ½ lb.; vermilion, q. s. to colour.

Ointment of Lu'puline. *Syn.* UNGUENTUM LUPULINÆ, L. *Prep.* (Soubeiran.) Lupuline, 1 part; lard, 3 parts; digest by the heat of a water bath for 5 or 6 hours, and strain. As an anodyne dressing to cancerous ulcers, and as a friction to swollen and painful joints.

Ointment of Lycopo'dium. *Syn.* UNGUENTUM LYCOPODII, L. *Prep.* Lycopodium, 1 dr.; balsam of Peru, ½ dr.; simple ointment, 1 oz. In chaps and excoriations.

Ointment of Mace. *Syn.* UNGUENTUM MACIDIS, L. *Prep.* From mace (beaten to a paste) and palm oil, of each, 1 lb.; purified beef-marrow, 3 lbs.; gently melted together, and strained. Emollient and stimulant; chiefly used as a pommade for the hair. Sold for 'common oil of mace.'

Ointment of Marsh-mal'low. *Syn.* UNGUENTUM ALTHÆÆ, DIALTHÆÆ, L. *Prep.* 1. (Ph. L. 1746.) Oil of mucilages, 2 lbs.; bees' wax, ½ lb.; yellow resin, 3 oz.; melt them together, then add of Venice turpentine, ½ oz., and stir the mixture until it concretes.

2. (Wholesale.) From palm oil, ½ lb.; yellow resin, 1¼ lb.; bees' wax, 2¼ lbs.; pale linseed oil, 9 lbs. (say 1 gall.); melt together, and stir until it is nearly cold.

Uses, &c. Emollient and stimulant; seldom used in regular practice, but in great repute amongst the common people. Linseed oil is now almost universally substituted for the oil of mucilages.

Ointment of Master-wort. *Syn.* POMMADE ANTI-CANCÉREUSE DE MILIUS; UNGUENTUM IMPERITORIÆ, L. *Prep.* (Beasley.) Powdered master-wort (*Imperatoria Ostruthium*), 1½ oz.; tincture of master-wort, 1 oz.; lard, 2 oz.

Ointment, Mercu″rial. *Prep.* 1. (STRONG MERCURIAL OINTMENT, BLUE O., NEAPOLITAN O.; UNGUENTUM HYDRARGYRI—B. P., Ph. L. E. & D., U. H. FORTIUS, U. CÆRULEUM.) *Prep.* 1. (B. P.) Mercury, 16; prepared lard, 16; prepared suet, 1; rub together until metallic globules cease to be visible. (See also MERCURIAL OINTMENT (Compound).

2. (Ph. L. & E.) Mercury, 1 lb.; lard, 11½ oz.; suet, ½ oz.; rub the mercury with the suet and a little of the lard, until globules are no longer visible; then add the remaining lard, and triturate all together.

3. (Ph. D.) Pure mercury and lard, of each, 1 lb.; as before.

Pur., &c. The 'stronger mercurial ointment' of the shops is usually made with a less quantity of mercury than that ordered by the Colleges, and the colour is brought up with finely ground blue black or wood charcoal. This fraud may be detected by its inferior sp. gr., and by a portion being left undissolved when a little of the ointment is treated, first with ether or oil of turpentine, to remove the fat, and then with dilute nitric acid, to remove the mercury. When made according to the instructions of the Ph., its sp. gr. is not less than 1·781 at 60° Fahr. It "is not well prepared so long as metallic globules may be seen in it with a magnifier of 4 powers." (Ph. E.) When rubbed on a piece of bright copper or gold, it should immediately give it a coating of metallic mercury, and a silvery appearance.

The *Ung. hyd. fort.* of the wholesale houses is generally made of mercury, 12 lbs., suet, 1½ lb., and lard, 16½ lbs. It thus contains only ⅖ instead of ½ its weight of mercury. That of the same houses labelled '*Ung. hyd. partes æquales*,' is prepared with mercury, 12 lbs.; suet, 1½ lb.; lard, 13½ lbs.

Uses. This ointment is chiefly used to introduce mercury into the system when the stomach is too irritable to bear it; in syphilis, hepatic affections, hydrocephalus, &c. For this purpose, ½ to 1 dr. is commonly rubbed into the inside of one of the thighs until every particle of the ointment disappears. This operation is repeated night and morning, until the desired effect is produced, and should be, if possible, performed by the patient himself. During its administration the patient should avoid exposure to cold, and the use of fermented or acidulous liquors, and his diet should consist chiefly of toast, broth, gruel, milk-and-water, and other inoffensive matters. This ointment has been employed to prevent the 'pitting' in smallpox; and, diluted with 3 or 4 times its weight of lard, in several skin diseases, as a dressing for ulcers, to destroy pediculi, &c. Camphor is often added to this ointment, to increase its activity. With the addition of a little extract of belladonna, or hydrochlorate of ammonia, it forms an excellent anodyne and resolvent friction in painful syphilitic tumours and glandular enlargements.

Obs. The preparation of mercurial ointment according to the common plan is a process of much labour and difficulty, and usually occupies several days. The instructions in the Pharmacopœias are very meagre and unsatisfactory, and, so far as details go, are seldom precisely carried out. Employers grumble, and operatives become impatient, when they find the most assiduous trituration apparently fails to hasten the extinction of the globules. To facilitate matters, various tricks are resorted to, and various contraband additions are often clandestinely made. Among the articles referred to, sulphur and turpentine are those which have been longest known, and, perhaps, most frequently employed for the purpose; but the first spoils the colour, and the other the consistence, of the ointment; whilst both impart to it more or less of their peculiar and respective odours. On the Continent, oil of eggs was formerly very generally used for the purpose, and is even now occasionally so employed. Nearly half a century ago Mr. W. Cooley clearly showed that the difficulty might be satisfactorily overcome by simply triturating the quicksilver with ⅙ to ¼ of its weight of old mercurial ointment, before adding the lard; and that the effective power of this substance was in direct proportion to its age, or the length of time it had been exposed to the air. His plan was to employ the 'bottom' and 'scrapings' of the store pots for the purpose. At a later period (1814-5), Mr. Higginbottom, of Northampton, repeated this recommendation, and at length the plan has been imported into the Pharmacopœia Borussica. About twenty years since, "we reopened an investigation of the subject, which extended over several months, during which we satisfied ourselves of the accuracy of the assertion of M. Roux, that the mercury in mercurial ointment exists entirely, or nearly so, in the metallic state, and not in the form of oxide, as was generally assumed. We succeeded in preparing an excellent sample of mercurial ointment by agitating washed suet and quicksilver together *in vacuo*. The quantity of oxide present at any time in this ointment is variable and accidental, and is largest in that which has been long prepared; but in no case is it sufficient to materially discolour the fat after the metallic mercury is separated from it. We were led to conclude that the property alluded to, possessed by old ointment, depends solely on the peculiar degree of consistence or viscidity of the fat present in it, and on the loss of much of the thoroughly greasy, 'anti-attritive' character, possessed by the latter in a recent state. In practically working out this idea, we obtained pure fats (MAGNETIC ADEPS; SEVUM PRÆPARATUM), which, without any addition, were capable of reducing, in a few minutes, 8, 16, 32, and even 48 times their weight of mercury. We also found that the formula of the Pharmacopœia might be adopted, and that a perfect ointment might be readily obtained by skilful management in from ½ an hour to an hour, even without these resources. All that was necessary was to employ a very gentle degree of heat, by either performing the operation in a warm apartment or by allowing the mortar to remain filled with warm water for a short time before using it. Suet or lard, reduced either by gentle warmth or by the addition of a little almond oil to the consistence of a thick cream, so that it will hang to the pestle without running from it, will readily extinguish 7 or 8 times its weight of running mercury by simple trituration. The exact temperature must, however, be hit upon, or the operation fails. This fact was afterwards noticed in the 'Ann. de Chim.,' and some other journals." (A. J. Cooley.)

M. Pomonti has proposed a method of preparing strong mercurial ointment, which, modified to suit the English operator, is as follows:—Fresh lard, 8 parts; solution of nitre (see *below*), 1 part; mix by trituration, add of mercury, 32 parts, and again triturate. The globules disappear after a few turns of the pestle, but reappear in a few minutes, and then again disappear to return no more. When this happens, the trituration is to be continued for a few minutes longer, when lard, 24 parts, is to be rubbed in, and the ointment at once put into pots. It is said that the globules are so completely extinguished as to escape detection, even when the ointment is examined by a microscope of low power. The SOLUTION.—Nitre, 100 grs.; water, 1 fl. oz.; dissolve. This quantity is sufficient for a kilogramme of mercury. See OINTMENT OF OXIDE OF MERCURY.

Ointment, Mercurial (Milder), MILDER BLUE OINTMENT, TROOPER'S O., UNCTION; UNGUENTUM HYDRARGYRI MITIUS, U. CÆRULEUM MITIUS. *Prep.* 1. Stronger mercurial ointment, 1lb.; lard, 2 lbs.

Uses, &c. In the itch and several other cutaneous diseases, as a dressing to syphilitic ulcers, to destroy pediculi on the body, &c. Each drachm contains 10 grs. of mercury. That of the shops generally contains considerably less.

2. (With SOAP; UNGUENTUM HYDRARGYRI SAPONACEUM; SAVON MERCURIEL).—*a.* (Draper.) Mercurial ointment (softened by a gentle heat), 1 oz.; hydrate of potassa, 1 dr., dissolved in water, ½ fl. oz.; triturate them together until the mass solidifies.

b. (Swediaur.) Milder mercurial ointment, 8 parts; soft soap, 2 parts; camphor, 1 part. In periostitis, engorgements of the testicles, soft corns, &c. See OINTMENT OF NITRATE OF MERCURY, &c.

Ointment, Mercurial (Compound), B. P. Mercurial ointment, 6; yellow wax, 3; olive oil, 3; camphor, 1½. Melt the wax and oil, and when the mixture is nearly cold, add the camphor in powder and the mercurial ointment, and mix.

Oint'ment of Meze'reon. *Syn.* UNGUENTUM MERZEREI, L. *Prep.* 1. (Hamb. Cod.) Alcoholic extract of mezereon, 2 drs.; dissolve in rectified spirit, q. s.; add it to white wax, 1 oz., lard, 8 oz., and mix by a gentle heat.

2. (P. Cod.) Mezereon (dried root-bark), 4 oz.; moisten it with rectified spirit, bruise it well, and digest it for 12 hours, at the heat of boiling water, in lard, 14½ oz.; then strain with pressure, and allow it to cool slowly; lastly, separate it from the dregs, remelt it, and add of white wax, 1½ oz. *Used* as a stimulating application to blistered surfaces and indolent ulcers.

Ointment of Mustard. *Syn.* UNGUENTUM SINAPIS. L. *Prep.* 1. Flour of mustard, ¾ oz.; water, 1 fl. oz.; mix, and add, of resin cerate, 2 oz.; oil of turpentine, ½ oz. Rubefacient and stimulant. As a friction in rheumatism. &c.

Frank.) Flour of mustard, 3 oz.; oil of almonds, ½ fl. oz.; lemon juice, q. s. In sunburn, freckles, &c.

Ointment of Naph'thalin. *Syn.* UNGUENTUM NAPHTHALINÆ, L. *Prep.* (Emery.) Naphthalin, ½ dr.; lard, 7½ drs. In dry tetters, lepra, psoriasis, &c.

Ointment, Neapolitan. See MERCURIAL OINTMENT.

Ointment, Nervine. *Syn.* BALSAMUM NERVINUM, UNGUENTUM N., L.; BAUME NERVAL, Fr. *Prep.* (P. Cod.) Expressed oil of mace and ox-marrow, of each, 4 oz.; melt by a gentle heat, and add, of oil of rosemary, 2 drs.; oil of cloves, 1 dr.; camphor, 1 dr.; balsam of tolu, 2 drs.; (the last two dissolved in) rectified spirit, 4 drs. In rheumatism, &c. A somewhat similar preparation was included in the Ph. E. 1744.

Ointment, Neu'tral. See COMPOUND LEAD OINTMENT.

Ointment of Ni'trate of Mercury. *Syn.* CITRINE OINTMENT, YELLOW O., MERCURIAL BALSAM; UNGUENTUM HYDRARGYRI NITRATIS (B. P., Ph. L. & D.), U. H. N., or U. CITRINUM (Ph. E.), L. *Prep.* 1. (Ph. L.) Mercury, 2 oz.; nitric acid (sp. gr. 1·42), 4 fl. oz.; dissolve, and mix the solution, whilst still hot, with lard, 1 lb., and olive oil, 8 fl. oz., melted together. (For the MILDER OINTMENT, see *below.*)

2. (Ph. E.) Mercury, 4 oz.; nitric acid (sp. gr. 1·500), 8 fl. oz. 6 fl. drs.; dissolve by a gentle heat, add the liquid to lard, 15 oz.; olive oil, 32 fl. oz.; melted together, and whilst the whole are still hot, and mix them thoroughly. "If the mixture does not froth up, increase the heat a little until this takes place. Keep the ointment in earthenware vessels, or glass vessels, secluded from the air." This admirable formula is a modification of that originally introduced into pharmacy by the late Dr. Duncan, of Edinburgh. (For the milder ointment, see *below.*)

3. (Ph. D.) Mercury, 1 oz.; nitric acid (1·500), 1 fl. oz.; (diluted with) water, ½ fl. oz.; dissolve by a gentle heat, and add the liquid to lard, 4 oz.; olive oil, 8 fl. oz.; melted together, and still hot; next "let the temperature of the mixture be raised so as to cause effervescence, and then, withdrawing the heat, stir the mixture with a porcelain spoon until it concretes on cooling."

4. (P. Cod.) Mercury, 3 parts; nitric acid (1·321), 6 parts; lard and oil, of each, 24 parts; as above.

5. (Ph. U. S.) Mercury, 1 oz.; nitric acid (1·42), 14 fl. oz.; lard, 3 oz.; fresh neat's-foot oil, 9 fl. oz.; mix the mercurial solution with the melted fat and oil at 200° Fahr.

6. (B. P.) Mercury, 4; nitric acid, 12; prepared lard, 15; olive oil, 32; dissolve the mercury in the nitric acid with the aid of a gentle heat; melt the lard in the oil by a steam or water bath in a porcelain vessel capable of holding six times the quantity, and while the mixture is hot add the solution of mercury, also hot, and mix them together thoroughly. If the mixture does not froth up, increase the

heat till this occurs. (The heat required for this is from 170° to 180° Fahr.

Uses, &c. Detergent and stimulant. In ring-worm, herpes, itch, porrigo, psoriasis, and some other chronic skin diseases; in various chronic affections of the eyes, especially chronic inflammation and ulceration of the eyelids, 'blear eye,' &c. It "may almost be regarded as specific in psorophthalmia, in the purulent ophthalmia of infants producing ectropium (eversion of the eyelids), and in ulcerations of the tarsi (edges of the eyelids)." (A. T. Thomson.) As a dressing to old ulcers, more especially those of a syphilitic character, it is superior to all the other ointments containing mercury; in sore legs, assisted by the internal use of the pill of soap with opium (PIL SAPONIS CUM OPIO), it often acts like a charm when all other modes of treatment have failed. For most of these purposes it should be diluted with from twice to seven times its weight of some simple fatty matter. One of the principal reasons why this ointment is in less general use than its merits deserve, is the very inferior quality of that vended in the shops under the name, arising from almost every druggist preparing some mess of his own, instead of adhering to the College formulæ.

Obs. Ointment of nitrate of mercury, faithfully prepared according to the instructions in the Pharmacopœia, possesses a rich golden-yellow colour, and a buttery consistence, and keeps well. Unfortunately, clumsy and careless operators, who regard the Pharmacopœia as a foolish book, which it is quite unnecessary to look into, often fail in their attempts to produce an article of good quality. The difficulty is immediately surmounted by employing pure ingredients, in the proportions ordered, and mixing them at the proper temperature. The acid should be of the full strength, or, if somewhat weaker than that directed, an equivalent quantity should be employed. A slight excess of acid is not injurious, rather the contrary; but a deficiency of acid, in all cases, more or less damages the quality of the product. If, on stirring the mercurial solution with the melted lard and oil, the mixture does not froth up, the heat should be increased a little, as, unless a violent frothing and reaction take place, the ointment will not turn out of good quality, and will rapidly harden and lose its colour. The most favourable temperature for the union of the ingredients is from 185° to 200° Fahr., and in no case should it exceed 212°; whilst below 180° Fahr., the reactions are feeble and imperfect.

Stoneware or glass vessels must alone be employed in the preparation of this ointment, and the stirrers or spatulas should be either of glass or white deal. The best plan is to keep the whole exclusively for the purpose, and when out of use to preserve them from dust and dirt. (See *below*.)

Ointment of Ni'trate of Mercury (Milder). *Syn.* MILDER CITRINE OINTMENT; UNGUENTUM HYDRARGYRI NITRATIS MITIUS (Ph. L.), U. H. N. M., or U. CITRINUM M. (Ph. E.) L. *Prep.* 1. (Ph. L.) Ointment of nitrate of mercury, 1 oz.; lard, 7 oz.; rub them together. "This ointment is to be used recently prepared."

2. (Ph. E.) As the stronger ointment, Ph. E., but using a triple proportion of oil and lard.

Uses, &c. See the STRONGER OINTMENT (*above*).

Ointment of Ni'trate of Sil'ver. *Syn.* UNGUENTUM ARGENTI NITRATIS, L. *Prep.* 1. (M. Jobert.) Nitrate of silver, 2, 4, or 6 parts; lard, 20 parts. These ointments are respectively numbered 1, 2, and 3, and are *used* in white-swelling.

2. (Macdonald.) Nitrate of silver, 1 part; lard, 7 to 8 parts. To smear bougies, in gonorrhœa, &c.

3. (Mackenzie.) Nitrate of silver, 5 grs.; lard, 1 oz. In purulent and chronic ophthalmia, ulcers on the cornea, &c.

4. (Velpeau.) Nitrate of silver, 1 gr.; lard, 1 dr. In acute ophthalmia, &c. The above compounds require to be used with caution.

Ointment of Ni'tric Acid. *Syn.* OXYGENIZED FAT†; UNGUENTUM OXYGENATUM, U. A. NITRICI, L.; POMMADE D'ALYON, Fr. *Prep.* (Ph. D. 1826.) Olive oil, 1 lb.; lard, 4 oz.; melt them together, add, gradually, of nitric acid (sp. gr. 1·500), 5½ fl. drs., and stir the mixture constantly with a glass rod until it concretes.

Uses, &c. In itch, porrigo, and some other chronic skin diseases; and as a dressing for syphilitic and herpetic ulcers, old sores, &c. It is frequently employed as a substitute for the ointment of nitrate of mercury, which it somewhat resembles in appearance; but it is less active and useful.

Ointment of Ni'tric Ox'ide of Mer'cury. *Syn.* OINTMENT OF RED OXIDE OF MERCURY (B.P.), RED PRECIPITATE OINTMENT; UNGUENTUM HYDRARGYRI NITRICO-OXYDI (Ph. L.), U. H. OXYDI (Ph. E.), U. H. O. RUBRI (B. P., Ph. D.), L. *Prep.* 1 (Ph. L.) White wax, 2 oz., lard, 6 oz.; mix, by heat, add of nitric oxide of mercury, in very fine powder, 1 oz., and rub them together.

2. (Ph. E.) Nitric oxide of mercury, 1 oz.; lard, 8 oz.; mix by trituration.

3. (Ph. D.) Red oxide of mercury (nitric oxide), 1 dr.; ointment of white wax, 7 drs.; as the last.

4. (B. P.) Red oxide of mercury, in very fine powder, 62 grs.; yellow wax, ½ oz.; oil of almonds, ¾ oz.; melt the wax, add the oil, and mix.

Uses, &c. An excellent stimulant application to indolent and foul sores, ulcers, &c.; and, when diluted, as an eye ointment in chronic inflammation and ulceration of the eyes and eyelids, and especially in psorophthalmia; also in specks on the cornea, and the other affections noticed under OINTMENT OF NITRATE OF MERCURY. It forms the basis of numerous quack medicines. See also OINTMENT OF OXIDE OF MERCURY (*below*).

Obstet'ric Ointment. *Syn.* UNGUENTUM OBSTETRICUM, L.; POMMADE OBSTETRICALE, Fr. *Prep.* 1. (Chaussier.) Extract of belladonna, 1 dr.; water, 2 drs.; lard, 1 oz. To promote the dilation of the os uteri.

2. (POMMADE POUR LE TOUCHER.) From yellow wax and spermaceti, of each, 1 oz.; olive oil, 16 oz.; melt them together, strain, add of solution of caustic soda, 1 fl. oz., and stir until the whole is nearly cold.

Ointment of O'pium. *Syn.* UNGUENTUM OPIATUM, U. OPII (Ph. L.), L. *Prep.* 1. (Ph. L.) Powdered opium, 20 grs.; lard, 1 oz.; mix by trituration. As a simple anodyne friction or dressing.

2. (Augustin.) Opium, 2 drs.; ox-gall, 2 oz.; digest 2 days, strain, and add, of melted lard, 2 oz.; oil of bergamot, 10 drops.

3. (Brera.) Opium, 1 dr.; gastric juice of a calf, ½ oz.; digest 24 hours, and add of melted lard, 1 oz.

Ointment of Oxide of Lead. See LEAD OINTMENT.

Ointment of Oxide of Man"ganese. *Syn.* UNGUENTUM MANGANESII OXYDI, U. M. BINOXYDI, L. *Prep.* 1. Black oxide of manganese (levigated), 1 dr.; lard, 1 oz.; mix by patient trituration. As a friction in scrofulous swellings and indurations; and in itch, scald-head, chilblains, &c.

2. (W. Cooley.) Binoxide of manganese, 1 dr.; sulphur, 2 drs.; lard, 9 drs.; cajeput oil, 15 drops. As the last; also as a friction in rheumatism, swelled joints, &c., and in porrigo, and some other skin diseases.

Ointment of Oxide of Mer'cury. Under this name the two ointments noticed below are often confounded, owing to the different opinions held respecting the atomic weight of mercury:—

1. **Ointment of Gray Oxide of Mer'cury.** *Syn.* OINTMENT OF SUBOXIDE OF MERCURY, O. OF PROTOXIDE OF M.†; UNGUENTUM HYDRARGYRI OXYDI, U. H. SUBOXYDI, U. H. O. CINEREI, L. *Prep.* 1. (Ph. E. 1817.) Gray oxide of mercury, 1 oz.; lard, 3 oz.; triturate together. Formerly proposed as a substitute for mercurial ointment, but in practice it has been found useless as a friction, owing to the unctuous matter only being absorbed, whilst the oxide is left on the surface. This objection does not apply to the following preparations:—

2. (Donovan.) Gray oxide of mercury, 20 grs.; lard, 1 oz.; mix, and expose them to the temperature of 320° Fahr. for 2 hours, constantly stirring. Gray coloured. It may also be made from the nitric- or red-oxide in the same way, by keeping the ointment heated to about 300° for some hours. Cleaner and stronger than Ung. hyd. fort.—Ph. L.

3. (Tyson.) Black oxide of mercury (prepared by decomposing precipitated calomel with liquors of potassa and ammonia), 2 oz.; lard, 1 lb.; triturate together. Inferior in activity to the last. It closely resembles in appearance a fine sample of mercurial ointment.

2. **Ointment of Red Oxide of Mercury.** *Syn.* UNGUENTUM HYDRARGYRI BINOXIDI†, U. H. OXYDI RUBRI, L. *Prep.* (Cazenave.) Red oxide of mercury, 30 grs.; camphor, 5 grs.; lard, 1 oz. Closely resembles ointment of nitric oxide of mercury, over which it, perhaps, possesses some advantage from the oxide being in a more minutely divided state.

Ointment of Oxide of Sil'ver. UNGUENTUM ARGENTI OXYDI, L. *Prep.* (Serre.) Oxide of silver, 16 to 20 grs.; lard, 1 oz. As a dressing for scrofulous and syphilitic sores, &c.

Ointment of Oxide of Zinc. *Syn.* ZINC OINTMENT; NIHIL ALBUM OINTMENT†; UNGUENTUM ZINCI (B. P., Ph. L. E. & D.), U. OXYDI ZINCI, L. *Prep.* 1. (Ph. L.) Oxide of zinc, 1 oz.; lard, 6 oz.; mix them together.

2. (Ph. E.) Oxide of zinc, 1 oz.; simple liniment (Ph. E.), 6 oz.

3. (Ph. D.) Ointment of white wax, 12 oz.; melt it by a gentle heat, add of oxide of zinc, 2 oz.; and stir constantly until the mixture concretes.

4. (B. P.) Oxide of zinc, in very fine powder, 1; benzoated lard, 5½; mix.

Uses, &c. Astringent, desiccative, and stimulant; in excoriations, burns, various skin diseases attended by profuse discharges, in chronic inflammation of the eyes depending on relaxation of the vessels, in sore nipples, indolent sores, ring-worm of the scalp, &c. It is an excellent and very useful preparation. See TUTTY OINTMENT (*below*).

Ointment of Pep'per. *Syn.* UNGUENTUM PIPERIS NIGRI, L. *Prep.* 1. Black pepper (bruised), 1 oz.; lard, 2 oz.; suet, 1 oz.; digest together in a covered vessel, by the heat of a water bath, for six hours, then strain, with pressure, add of expressed oil of mace, 2 drs., and stir until the mixture concretes. In piles, itch, as a friction in rheumatism, &c.

2. (Ph. D. 1826.) Black pepper (in fine powder), 4 oz.; lard, 1 lb.; mix. In scald-head, &c.

Ointment of Phosphor'ic Acid. *Syn.* UNGUENTUM ACIDI PHOSPHORICI, L. *Prep.* (Soubeiran.) Phosphoric acid, 1 dr.; lard (softened by heat), 1 oz.; triturate carefully together. As a friction in caries, osseous tumours, &c.

Ointment of Phos'phorus. *Syn.* UNGUENTUM PHOSPHORI, U. PHOSPHORATUM, L. *Prep.* (P. Cod.) Phosphorus, 1 dr.; lard, 6 oz. 3 drs.; melt together (in a wide-mouthed bottle) by the heat of a water bath, remove the vessel from the heat, and shake it briskly until the ointment concretes. As a friction in gout, chronic rheumatism, and several skin diseases.

Ointment of Picrotox'in. *Syn.* UNGUENTUM PICROTOXINÆ, L. *Prep.* (Jäjer.) Picrotoxin, 10 grs.; lard, 1 oz. In ring-worm of the scalp, and to destroy pediculi. It should be used with care.

Ointment for Piles. *Syn.* UNGUENTUM HÆMORRHOIDALE, U. ANTI-HÆMORRHOIDALE, L. *Prep.* 1. Burnt alum and oxide of zinc, of each, ½ dr.; lard, 7 drs.

2. (Bories.) Acetate of lead, 15 grs.; freshly burnt cork, ½ oz.; washed fresh butter, 2 oz.; triturate well together.

3. (W. Cooley.) Morphia, 8 grs.; melted spermaceti ointment, 1 oz.; triturate together until solution is complete, then add, of galls (in impalpable powder), 1½ dr., essential oil of almonds (genuine crude), 12 to 15 drops, and stir until the mass concretes. In painful piles, prolapsus, &c. It is not only very effective, but does not soil the linen so much as most other ointments.

4. (Dr. Gedding.) Carbonate of lead, 4 drs.; sulphate of morphia, 15 grs.; stramonium ointment, 1 oz.; olive oil, q. s. When there is much pain and inflammation.

5. (Sir H. Halford.) Ointment of nitrate of mercury and oil of almonds, equal parts, triturated together.

6. (Mazzini.) Nitrate of morphia, 15 grs.; citrine ointment, 1 dr.; fresh butter, 1 oz. As the last.

7. (Vallez.) Extract of elder leaves, ½ dr.; burnt alum, 16 grs.; poplar ointment, 1 oz. For other formulæ, see the respective names of their leading ingredients.

8. (Ware.) Camphor, 1 dr.; simple ointment, 1 oz.; dissolve by heat, add of powdered galls, 2 drs.; mix well, further add of tincture of opium, 2 fl. drs., and stir until the whole is cold. In flabby mucous and painful piles.

9. (Zanin.) Spermaceti ointment, 1 oz.; powdered galls, 1 dr.; powdered opium, 18 grs.; solution of diacetate of lead, 1 fl. dr. When there is both pain and inflammation.

Ointment of Pitch. *Syn.* BLACK BASILICON, OINTMENT OF BLACK PITCH; UNG. PICIS (B. P., Ph. L.), U. PICIS NIGRÆ, L. *Prep.* 1. (Ph. L.) Black pitch, resin, and bees' wax, of each, 11 oz.; olive oil, 1 pint; melt together, strain through a linen cloth (and stir until the mass concretes).

2. (B. P.) Tar, 5; yellow wax, 2; melt together, and stir till cold.

Uses, &c. Stimulant and detergent; very useful in indolent ulcerations, scald-head, and various foul eruptions. In itch and psoriasis, and other scaly skin diseases, a little sulphur is commonly added to it.

Oil of Plat'inum. *Syn.* UNGUENTUM PLATINI, L. *Prep.* (Hœfer.) Bichloride of platinum, 15 grs.; extract of belladonna, ½ dr.; lard, 1 oz. As a dressing for painful indolent ulcers.

Ointment of Plumbago. *Syn.* OINTMENT OF GRAPHITE; UNGUENTUM GRAPHITIS, U. PLUMBAGINIS, L. *Prep.* From pure plumbago ('black-lead'), 1½ dr.; lard, 1 oz. As a dressing to ulcers, and in certain skin diseases.

Plunket's Ointment. *Prep.* (Original formula.) Crowsfoot, 1 handful; dog's fennel, 3 sprigs; pound well, add of flowers of sulphur and white arsenic, of each, 3 thimblefuls; beat them well together, form the mass into boluses, and dry them in the sun. For use, powder them; and mix the powder with yolk of egg, spread a little on a small piece of pig's bladder (size of half a crown), and apply it to the sore, where it must remain until it falls off by itself. Poisonous; in cancer; with great caution.

Poma'tum Ointment. See LARD OINTMENT.

Ointment of Pop'lar Buds. *Syn.* UNGUENTUM POPULEUM, L. *Prep.* 1. Fresh poplar buds (bruised), 1 part; lard, 4 parts; boil until crisp, and strain. It never gets rancid. Emollient and stimulant.

2. (Compound—P. Cod.) Poplar buds, 12 oz.; fresh leaves of belladonna, common nightshade (*Solanum nigrum*), henbane, and poppies, of each, 8 oz.; lard, 4½ lbs.; as the last. Emollient, stimulant, and anodyne.

Ointment of Potas'sio-tar'trate of An'timony. *Syn.* ANTIMONIAL OINTMENT, TARTAR EMETIC O.; UNGUENTUM ANTIMONII TARTARATI (B.P.), UNGUENTUM ANTIMONII POTASSIO-TARTATRIS (Ph. L.), U. A. TARTARIZATI (Ph. D.), U. ANTIMONIALE (Ph. E.), U. TARTARI EMETICI, L. *Prep.* 1. (Ph. L. & E.) Potassic-tartrate of antimony, rubbed to a very fine powder, 1 oz.; lard, 4 oz.; mix by trituration.

2. (Ph. D.) Tartar emetic, in very fine powder, 1 dr.; ointment of white wax, 7 drs.

3. (B. P.) Tartrated antimony (in fine powder), 1; simple ointment, 4; mix.

Uses, &c. Counter-irritant; in phthisis, chronic rheumatism, certain liver affections, and other deep-seated pains and diseases. A portion, about the size of a nut, is rubbed on the skin night and morning, until a crop of pustules is produced. The part should be well rubbed with a coarse towel, so as to be reddened, before applying the ointment. The product of the Dublin formula is of only half the strength of those of the other Colleges.

Obs. Before adding the tartar emetic to the lard it should be reduced to the state of an impalpable powder. The precipitated salt is the best for this purpose. As the pustules formed by this ointment permanently mark the skin, it should only be applied to those parts of the person which are covered by the dress.

Pur'gative Ointment. See OINTMENT OF COLOCYNTH, WORM O., &c.

Ointment of Quinine'. *Syn.* UNGUENTUM QUINIÆ, U. QUINIÆ SULPHATIS, L. *Prep.* 1. Sulphate of quinine, 1 dr.; lard, 3 drs. In the agues of children.

2. (Beasley *ex* Antonini.) Sulphate of quinine, 1 dr.; alcohol (rectified spirit), 2 drs.; sulphuric acid, 10 drops; dissolve, and mix it with lard, ½ oz. In malignant intermittents; 2 to 4 drs. at a time, rubbed into the groin or axilla.

Ointment of Red Sul'phuret of Mer'cury.

Syn. Unguentum hydrargyri bisulphureti, U. h. sulphureti rubri, L. *Prep.* 1. (Alibert.) Red sulphuret of mercury, 1 dr.; camphor, 20 grs.; simple ointment, 1 oz. In herpes, applied twice a day.

2. (Collier.) Bisulphuret of mercury, 1½ dr.; sal ammoniac, ½ dr.; lard, 1 oz.; rose water, 1 fl. dr. In several skin diseases, to diminish the itching, destroy pediculi, &c.

3. (Radius.) As the last, with 1 oz. more lard.

Ointment of Res'in. *Syn.* Yellow basilicon; Unguentum resinæ (Ph. D.), U. resinosum (Ph. E.), L. *Prep.* 1. (Ph. D.) Yellow wax, ¼ lb.; yellow resin, in coarse powder, ½ lb.; prepared lard, 1 lb.; melt them together by a gentle heat, strain the mixture, whilst hot, through flannel, and stir it constantly until it concretes.

2. (Ph. E.) Bees' wax, 2 oz.; resin, 5 oz.; lard, 8 oz.

Obs. A useful stimulant dressing to foul and indolent ulcers. For the corresponding preparation of the Ph. L., see Resin Cerate (page 314).

Ointment, Resol'vent. See Discutient Ointment.

Ointment, Ring'-worm. Unguentum contra-tineam, L. *Prep.* 1. Carbonate of soda, 1 part; fresh-slaked time, 4 parts; lard, 120 parts.

2. Ointment of nitrate of mercury, 1 dr.; tar ointment and lard, of each, ½ oz.

3. (Henke.) Hydrochloric acid, 1 fl. dr.; juniper-tar ointment, ½ oz.; marsh-mallow do., 1 oz.

4. (Pereira.) Tar, 3 drs.; lard, 1½ oz.; melt them together, and stir in of acetic acid (Ph. L.), 2 fl. drs.

5. (Thompson.) Carbonate of soda and sulphuret of potassium, of each, 1 dr.; creasote, ½ dr.; lard, 1½ oz.

Obs. The hair must be cut off close, and the part washed clean before each application. For other forms, see *above*.

Ointment of Rose. *Syn.* Rose pommade, Rose lip-salve; Unguentum rosæ, U. rosatum, L. *Prep.* 1. (P. Cod.) Washed lard (melted), and roses (centif.), of each, 2 lbs.; mix, and in 2 days remelt the mass, and press out the fat; to this last add of fresh roses, 2 lbs.; and repeat the process; lastly, colour it with alkanet root, if required red.

2. (Ung. aquæ rosæ—Ph. U. S.) This is spermaceti ointment melted and beaten up with about ⅔rds of its weight of rose water until they congeal. Both the above are simple emollients. The last is an officinal 'cold cream.'

Ointment, Rust's. *Prep.* Calcined alum, 1½ dr.; camphor, ½ dr.; powdered opium, 20 grs.; balsam of Peru, 1 dr.; lead ointment, 5 drs.; triturate together. In chilblains, frostbites, frosted limbs, &c.

Ointment of Sabadil'line. *Syn.* Unguentum sabadillinæ, L. *Prep.* (Dr. Turnbull.) Sabadilline, 15 to 20 grs.; lard, 1 oz. Intended as a substitute for ointment of veratrine.

Ointment of Sav'ine. *Syn.* Unguentum sabinæ (Ph. L. & D.), Ceratum sabinæ, L. *Prep.* 1. (Ph. L.) White wax, 3 oz.; lard. 1 lb.; melt them together, mix in of fresh savine (bruised), ½ lb., and press through a linen cloth.

2. (Ph. D.) Savine tops, dried and in fine powder, 1 dr.; ointment of white wax, 7 drs.; mix by trituration. For the formula of the Ph. E., the uses, &c., see Cerate.

Ointment of Scrophula"ria. *Syn.* Unguentum scrophulariæ, L. *Prep.* (Ph. D. 1826.) Green leaves of knotted rooted figwort and lard, of each, 2 lbs.; prepared suet, 1 lb.; boil till crisp, and strain with pressure. In ring-worm, 'burnt holes' (*pemphigus gangrenosus* of children), impetigo, and some other cutaneous diseases; also as an application to piles, painful swellings, &c. In the second it is said to be almost specific.

Ointment, Simple. *Syn.* Ointment of white wax, Simple dressing; Unguentum simplex (B. P., Ph. E.), U. ceræ albæ (Ph. D.), L. *Prep.* 1. (Ph. E.) Olive oil, 5½ fl. oz.; white wax, 2 oz.; melted together, and stirred whilst cooling.

2. (Ph. D.) Prepared lard, 4 lbs.; white wax, 1 lb.; as the last.

3. (B. P.) White wax, 2; prepared lard, 3; almond oil, 8; melt together, and stir till it becomes solid.

Obs. The above are mild emollients, useful in healthy ulcers, excoriations, &c.; but chiefly as forming the basis for other ointments. The corresponding preparation of the Ph. L. is spermaceti ointment. See *below*, also Lard Ointment, &c.

Ointment, Singleton's. See Eye Ointments.

Ointment, Small-pox. *Syn.* Unguentum ectroticum, L. *Prep.* 1. Mercurial ointment, 1½ oz.; bees' wax and black pitch, of each, ½ oz.; expressed oil of mace, 2 drs.; mixed together by a very gentle heat.

2. (Briquet.) Mercurial ointment, 4 parts; powdered starch, 1 part.

3. (Tourriere.) Iodide of potassium (dry and in fine powder), 1 part; expressed oil of mace, 2 parts; black resin, 4 parts; mercurial ointment, 8 parts. *Used* to prevent the 'pitting' of the pustules. See Smallpox.

Ointment, Smellome's. See Eye Ointments.

Ointment of Soap. 1. See Cerate.

2. (Camphorated; Unguentum saponis camphoratum—Hamb. Cod.) White soap (scraped), 1 lb.; water, ½ lb.; dissolve by heat; add of olive oil, 5 oz.; and when the mixture has partly cooled, further add of camphor, 1 oz., previously dissolved by heat in olive oil, 1 oz.; lastly, stir until the mass concretes. As an anodyne and stimulating friction in various local affections, as chaps, chilblains, rheumatism, &c.

Ointment of So'dio-Chlo"ride of Gold. *Syn.* Unguentum auri sodio-chloridi, L.; Pom-

MADE DE MURIATE D'OR ET DE SOUDE, Fr. *Prep.* (Magendie.) Sodio-chloride of gold, 10 grs.; lard, 4 drs. In scrofulous and syphilitic swellings, indurations, ulcers, &c.

Ointment of Spermace'ti. *Syn.* EMOLLIENT DRESSING, SIMPLE OINTMENT, WHITE O.; UNGUENTUM CETACEI (B. P., Ph. L. & D.), U. SPERMATIS CETI, L. *Prep.* 1. (Ph. L.) Spermaceti, 5 oz.; white wax, 14 drs.; olive oil, 1 pint, or q. s.; melt them together by a gentle heat, and stir the mixture until cold.

2. (Ph. D.) White wax, ½ lb.; spermaceti, 1 lb.; prepared lard, 3 lbs.; as the last.

3. (B. P.) Spermaceti, 5; white wax, 2; almond oil, 20, or a sufficiency; stir constantly till it cools.

Uses, &c. As an emollient and healing application or dressing to abrasions, excoriations, blistered surfaces, healthy ulcers, chilblains, chaps, &c. In trade, the Dublin formula, with double the amount of lard, is commonly employed. See LARD OINTMENT, SIMPLE O., &c.

Ointment of Squills. *Syn.* UNGUENTUM SCILLÆ, L. *Prep.* 1. (Brera). Squills (in very fine powder), 1 dr.; mercurial ointment, 2 drs.

2. (Hufeland.) Squills, 1 oz.; liquor of potassia, 2 fl. oz.; reduce to a mucilage by boiling, then add of lard, 2 oz. or q. s. As a resolvent friction to indolent tumours and indurations.

Ointment of Stavesa'cre. *Syn.* UNGUENTUM STAPHISAGRIÆ, L. *Prep.* (Swediaur.) Powdered stavesacre, 1 oz.; lard, 3 oz.; melt together, digest 3 or 4 hours, and strain. A very cleanly remedy for itch, and to destroy pediculi on the person. A similar ointment is much used by farriers.

Ointment of Stramo"nium. *Syn.* UNGUENTUM STRAMONII, L. *Prep.* 1. Fresh thorn-apple leaves, 1 part; lard, 4 parts; as ointment of hemlock.

2. (Pereira.) Powdered leaves, 1 oz.; lard, 4 oz.; mix by trituration.

3. (Ph. U. S.) Extract of stramonium, 1 dr.; lard, 1 oz.; as the last.

Uses, &c. To dress irritable ulcers, and as an application to painful piles.

Ointment of Strych'nine. *Syn.* UNGUENTUM STRYCHNIÆ, L. *Prep.* 1. (Bouchardat.) Strychnine, 16 grs.; lard, 1 oz.; carefully triturated together.

2. (Wendt.) Nitrate of strychnine, 6 grs.; lard, 1 oz.; as last. Both are used as a friction in paralysed parts, &c. From the extremely poisonous character of strychnine, it should be used with caution.

Ointment of Subac'etate of Cop'per. See VERDIGRIS OINTMENT.

Ointment of Subacetate of Lead (Compound). *Syn.* UNGUENTUM PLUMBI SUBACETATIS COMPOSITUM (B. P.). *Prep.* Solution of subacetate of lead, 6; camphor, ½; white wax, 8; almond oil, 20; melt the wax with 16 of the oil on a steam- or water-bath; remove the vessel, and as soon as the mixture begins to thicken, gradually add the solution of subacetate of lead, and stir the mixture constantly until it cools; then add the camphor, dissolve in the rest of the oil, and mix thoroughly.

Ointment of Subchloride of Mercury. See OINTMENT OF CALOMEL.

Ointment of Subsul'phate of Mercury†. *Syn.* UNGUENTUM HYDRARGYRI SUBSULPHATUS, L. *Prep.* 1. (Alibert.) Turpeth mineral, ½ dr.; lard, 1 oz.

2. (Biett.) Turpeth mineral, 1 dr.; sulphur, 2 drs.; lard, 2 oz.; oil of lemons, 15 drops. In herpes, porrigo, and the scaly skin diseases.

Ointment of Sul'phate of I'ron. *Syn.* UNGUENTUM FERRI SULPHATIS, L. *Prep.* (Velpeau.) Sulphate of iron, 1½ dr.; simple ointment, 1 oz. In erysipelas.

Ointment of Sul'phate of Man"ganese. *Syn.* UNGUENTUM MANGANESI SULPHATIS, L. *Prep.* From sulphate of manganese, 1 dr.; lard or simple ointment, 1 oz. Alterative and discutient; in similar cases to those in which MERCURIAL OINTMENT is employed.

Ointment of Sulphate of Zinc. *Syn.* UNGUENTUM ZINCI SULPHATIS, L. *Prep.* (Scarpa.) Sulphate of zinc (in very fine powder), 1 dr.; lard, 1 oz. In some chronic skin diseases attended with a lax state of the tissues, and as a dressing to scrofulous tumours after they have separated and the abscess has been discharged.

Ointment of Sul'phur. *Syn.* UNGUENTUM SULPHURIS (B. P., Ph. L. E. & D.). *Prep.* 1. (Ph. L.) Sulphur, ½ lb.; lard, 1 lb. In the Ph. L. 1836 oil of bergamot, 40 drops, were added. (See 4, Compound.)

2. (Ph. E.) Sulphur, 1 oz.; lard, 4 oz.

3. (Ph. D.) Sulphur, 1 lb.; lard, 4 lbs.

4. (B. P.) Sublimed sulphur, 1; benzoated lard, 4; mix.

Uses, &c. In itch, scald-head, &c., in the first of which it is specific. It should be well rubbed in every night until the disease is cured; "but not more than one fourth part of the body should be covered with it at a time." (A. T. Thomson.)

5. (Compound; ITCH OINTMENT; UNGUENTUM SULPHURIS COMPOSITUM—Ph. L.)—*a.* (Ph. L.) Nitrate of potassa (powdered), 40 grs.; white hellebore (powdered), 10 drs.; sulphur and soft soap, of each, 4 oz.; lard, 1 lb.; rub them together.

b. (P. Cod.) Alum and sal ammoniac, of each, ½ oz.; sulphur, 8 oz.; lard, 16 oz.

Uses, &c. In itch, as the simple ointment (1, 2, and 3). They are more efficacious, but, owing to the presence of white hellebore, the Ph. L. preparation is apt to cause irritation in persons with delicate skins. See ITCH OINTMENT.

Ointment of Sul'phuret of Mercury. See OINTMENT OF RED SULPHURET OF MERCURY.

Ointment of Sulphurated Potash. *Syn.* UNGUENTUM POTASSÆ SULPHURATÆ (B. P.). Sulphurated potash, 30 grs.; triturate, and add prepared lard, 1 oz.; mix. See also next preparation.

Ointment of Sulphuret of Potas'sium. *Syn.* UNGUENTUM POTASSII SULPHURETI, L. *Prep.* 1. Sulphuret of potassium (dry and in fine powder), 1 dr.; lard, 9 drs. Alibert adds 1 dr. of carbonate of soda.

2. Sulphuret of potassium, 2½ drs.; lard and soft soap, of each, 1 oz.; olive oil, ½ oz. In several chronic skin diseases, as itch, psoriasis, ring-worm, lepra, eczema, &c.

Ointment of Sulphuret of So'dium. *Syn.* UNGUENTUM SODII SULPHURETI, L. *Prep.* (Swediaur.) Sulphuret of sodium, 3 drs.; lard, 1½ oz. In itch, for which it is very cleanly and effective. The last two ointments are most powerful when recently prepared.

Ointment of Sulphuric Ac'id. *Syn.* UNGUENTUM ACIDI SULPHURICI, L. *Prep.* 1. (Dr. Duncan.) Sulphuric acid, 1 dr.; lard, 2 oz.

2. (Ph. D. 1826.) Sulphuric acid, 1 dr.; lard, 1 oz.; mix.

Uses, &c. Black, fetid; in itch. It is now seldom used. With oil of turpentine, it has been used as a stimulating liniment in rheumatism. An ointment made of 1½ dr. of dilute sulphuric acid to 1 oz. of lard is a good application in prurigo.

Ointment, Sulta'na. Spermaceti and white wax, of each, ¼ oz.; oil of almonds and butter of cacao, of each, ¼ lb.; melt together, add of balsam of Peru, 1 dr., stir constantly for a few minutes, and after it has settled pour off the clear portion; to this add of orange-flower water, 2 fl. drs., and stir the mixture constantly until it concretes. A very agreeable species of cold cream.

Ointment of Tan'nate of Lead. *Syn.* UNGUENTUM PLUMBI TANNATIS, L. *Prep.* 1. Tannate of lead, 1½ drs.; powdered camphor, 20 grs.; spermaceti ointment, 7 drs. In inflamed piles, &c.

2. (Sundelin.) Decoction of oak bark, 6 fl. oz.; solution of diacetate of lead, 1½ oz.; mix, collect and drain the precipitate, and mix it, whilst still moist, with lard, 1 oz.; camphor, 10 grs. In bed-sores.

Ointment of Tan'nin. *Syn.* UNGUENTUM TANNINI, U. ACIDI TANNICI, L. *Prep.* (Richard.) Tannin, 2 drs.; water, 2 fl. drs.; triturate them together, then add of lard, 1½ oz. Astringent and hæmostatic. In piles, prolapsus, &c. It is a very cleanly and effective application.

Ointment of Tar. *Syn.* UNGUENTUM PICIS LIQUIDÆ (Ph. L. E. & D.), L. *Prep.* 1. Ph. L.) Tar and suet, of each, 1 lb.; melt them together, and press the mixture through a linen cloth.

2. (Ph. E.) Tar, 5 oz.; bees' wax, 2 oz.; melt together, and stir the mixture briskly until it concretes.

3. (Ph. D.) Tar, ½ pint; yellow wax, 4 oz.; as the last.

Uses, &c. As a detergent application in ring-worm, scald-head, scabby eruptions, foul ulcers, &c. It should be, in general, at first diluted with half of its weight of lard or oil. See also OINTMENT OF PITCH.

Ointment of Tartar Emet'ic. See OINTMENT OF POTASSIO-TARTRATE OF ANTIMONY.

Ointment of Tobac'co. *Syn.* UNGUENTUM TABACI, L. *Prep.* 1. (Chippendale.) Extract of tobacco, 1 dr.; lard, 1 oz. As a friction in neuralgia.

2. (Ph. U. S.) Fresh tobacco leaves, 1 oz.; lard, 12 oz.; as ointment of hemlock. As an anodyne application in irritable ulcers, ring-worm, prurigo, and some other skin diseases.

Ointment, Tripharm'ic. *Syn.* OINTMENT OF THREE THINGS; UNGUENTUM TRIPHARMACI, L. *Prep.* From lead plaster, 4 oz.; olive oil, 2 fl. oz.; distilled vinegar, 1 fl. oz.; melt together, and stir until they combine, and a proper consistence is obtained. Cooling and desiccative; formerly greatly esteemed as a dressing.

Ointment, Trooper's. See MERCURIAL OINTMENT.

Ointment of Turpentine. *Syn.* UNGUENTUM TEREBINTHINÆ (B. P.). *Prep.* 1. (Guy's Hosp.) Camphor, 1 dr.; oil of turpentine, 1 to 2 fl. drs.; dissolve, and add of resin cerate, 1 oz. As a stimulant and anodyne friction in nephritic and rheumatic pains, engorgements, &c.

2. (Ph. Austr.) Turpentine, 2 lbs.; simple ointment, 1 lb.; mix by a gentle heat. As a stimulant dressing.

3. (B. P.) Oil of turpentine, 16; camphor, 1; soft soap, 2; dissolve the camphor in the turpentine, add the soap, and rub till thoroughly mixed.

Ointment of Tut'ty. *Syn.* UNGUENTUM ZINCI OXYDI IMPURI, U. TUTIÆ, L. *Prep.* From prepared tutty, 1 part; simple ointment, 5 parts; mix by trituration. Formerly in great repute in ophthalmic practice, more particularly in inflammation, &c., of the eyelids. See OINTMENT OF OXIDE OF ZINC.

Ointment of Vera'trine. *Syn.* UNGUENTUM VERATRIÆ (B. P.); POMMADE DE VERATRINE, Fr. *Prep.* 1. (Magendie.) Veratrine, 4 grs.; lard, 1 oz.; mixed by careful trituration.

2. (Pereira.) Veratrine, 30 grs.; lard, 1 oz.

3. (Turnbull.) Veratrine, 10 to 20 grs.; olive oil, 1 dr.; triturate, and add of spermaceti ointment, 1 oz.

4. Veratria, 8 grs.; prepared lard, 1 oz.; olive oil, ½ dr.; rub the veratria and the oil together, then mix thoroughly with the lard.

Uses, &c. As a friction in neuralgia, neuralgic rheumatism, gout, dropsy, &c. A piece, about the size of a hazel nut, is to be rubbed for 10 or 15 minutes over the seat of pain, twice a day. It must not be applied where the skin is unsound, nor to a large surface at a time; and the greatest caution must be used, as account of the extremely poisonous character of veratrine.

Ointment of Ver'digris. *Syn.* OINTMENT OF SUBACETATE OF COPPER; UNGUENTUM ÆRUGINIS (Ph. E.), U. CUPRI SUBACETATIS (Ph. D.), L. *Prep.* 1. (Ph. E.) Resinous ointment, 15 oz.; melt by a gentle heat, sprinkle into it of verdigris (in very fine powder), 1 oz., and stir the mixture briskly until it concretes.

2. (Ph. D.) Prepared subacetate of copper, ½ dr.; ointment of white wax, 7½ drs.; mix by trituration.

Uses, &c. Detergent and escharotic; as an occasional dressing to foul and flabby ulcers, to keep down fungous flesh, and, diluted with oil or lard, in scrofulous ulceration and inflammation of the eyelids.

Ointment of Vin'egar. *Syn.* ACETIC OINTMENT; UNGUENTUM ACETI, U. ACIDI ACETICI, L. *Prep.* 1. (Dr. Cheston.) Olive oil, 1 lb.; white wax, 4 oz.; melt them together by a gentle heat, add of strong vinegar, 2 fl. oz., and stir until the mixture concretes. As a cooling astringent dressing, and as an application in chronic ophthalmia.

2. (W. Cooley.) Acetate of morphia, 6 grs.; acetic acid (Ph. L.) and water, of each 1½ fl. dr.; dissolve, add the solution to simple ointment (melted), 1½ oz., and stir the mixture briskly until nearly cold. In chronic ophthalmia, painful inflamed piles, &c.; also to remove freckles, and to allay itching and irritation in several skin diseases.

Ointment, White. Both SPERMACETI OINTMENT and OINTMENT OF CARBONATE OF LEAD were formerly so called, but the name is now obsolete. The CAMPHORATED WHITE OINTMENT of the Ph. L. of 1746 (UNG. ALBUM CAMPHORATUM) was spermaceti ointment to which a little camphor had been added.

Ointment of White Precipitate. *Syn.* OINTMENT OF AMMONIATED MERCURY; UNGUENTUM HYDRARGYRI AMMONIATI (B. P.). Ammoniated mercury, 62 grs.; simple ointment, 1 oz.; mix. See OINTMENT OF AMMONIO-CHLORIDE OF MERCURY.

Ointment of White Wax. See SIMPLE OINTMENT.

Ointment of Wolfsbane. See OINTMENT OF ACONITE.

Ointment for Worms. *Syn.* UNGUENTUM ANTHELMINTICUM, U. VERMIFUGUM, L. *Prep.* 1. (Boerhaave.) Aloes and ox-gall, of each, 1 part; marsh-mallow ointment, 8 parts.

2. (Fr. Hosp.) Aloes and oil of tansy, of each, 1 part; dried ox-gall, 2 parts; (both in fine powder;) lard, 8 parts.

3. (Ph. Bat.) Aloes, 1 dr.; dried ox-gall and petroleum, of each, 1½ dr.; lard, 1½ oz.

4. (Soubeiran.) Powdered aloes, 2 drs.; lard, 1 oz.

Uses, &c. The above are purgative and vermifuge, applied as frictions to the abdomen. They are chiefly employed for children and delicate females. See COLOCYNTH OINTMENT.

Ointment of Yel'low Wax. *Syn.* UNGUENTUM CERÆ FLAVÆ, L. *Prep.* (Ph. D. 1826.) Bees' wax, 1 lb.; lard, 4 lbs.; melt them together. A mild emollient dressing. Some parties regard it as more 'healing' than the OINTMENT OF WHITE WAX.

Ointment of Zinc. 1. See OINTMENT OF OXIDE OF ZINC.

2. (Compound; UNGUENTUM ZINCI COMPOSITUM, L.)—*a.* (Hufeland.) Oxide of zinc and lycopodium, of each, 1 dr.; simple ointment, 1 oz. In excoriations and simple ulcerations, especially those of the eyelids, nipples, &c.

b. (Thomson.) Oxide of zinc, ½ dr.; powdered opium, 5 grs.; lard, 1 oz. As the last, when there is much pain.

OINTMENTS (Flower of). *Syn.* FLOS UNGUENTORUM, L. *Prep.* From resin, thus, wax, and suet, of each, ½ lb.; olibanum and Venice turpentine, of each, 2½ oz.; myrrh, 1 oz.; wine, ½ pint; boil them together, and, lastly, add of camphor, 2 drs. Suppurative; warming.

O'LEFIANT GAS. C_2H_4. *Syn.* ETHYLENE, HEAVY CARBONETTED HYDROGEN, HEAVY CARBURETTED H., ELAYL, ETHENE. A substance discovered by some associated Dutch chemists, in 1795, and composed of carbon and hydrogen in the proportions expressed by C_2H_2 or C_4H_4.

Prep. 1. A mixture of alcohol (rectified spirit), 1 part, and oil of vitriol, 6 parts, is heated in a retort until it blackens, and sulphurous acid begins to be evolved; the product is then passed first through a wash-bottle containing a solution of caustic potassa or milk of lime, and next through a bottle containing concentrated sulphuric acid, the last being furnished with a tube dipping into the water of the pneumatic trough.

2. The vapour of boiling alcohol is passed into a mixture of oil of vitriol diluted with rather less than one half its weight of water, and so heated as to be in a state of tranquil ebullition (320° to 330° Fahr.); the gaseous product is chiefly olefiant gas, and the vapour of water, from which it may be separated as above. No sulphurous acid is formed, nor does the acid blacken as in the last process.

Prop., &c. Colourless; neutral; nearly odourless; nearly insoluble in water; alcohol, ether, and the volatile and fixed oils, absorb a portion of it; burns with a brilliant white flame; at a full red heat it suffers decomposition, with deposit of carbon and liberation of light carburetted hydrogen gas; mixed with twice its volume of chlorine and inflamed, hydrochloric acid is formed, and the carbon of the gas is precipitated in the form of dense black soot; if the mixture (best in equal volumes), instead of being kindled, be left standing over water, it soon condenses into a heavy oily liquid (chloride of olefiant gas, Dutch liquid). Sp. gr. ·981; 100 cubic inches weigh 30·57 grs.

Olefiant Gas, Bromide of. *Syn.* BROMIDE OF ETHYLENE. From bromine and olefiant gas.

as Dutch liquid. A colourless liquid, with an ethereal odour, boiling at 265°, and solidifying at 0° Fahr. Sp. gr. 2·16.

Olefiant Gas, Chlo″ride of. *Syn.* DUTCH LIQUID, CHLORIDE OF ETHYLENE. This substance, referred to above, may be easily prepared in any quantity by the following process:—Chlorine and olefiant gas (the latter a little in excess) are conveyed by separate tubes (passing through the same cork) into a glass globe, having a narrow funnel-shaped neck at its lower part, dipping into a small bottle destined to receive the product of their mutual reaction; the newly formed liquid trickles down the sides of the globe into the receiver, and when a sufficient quantity is collected, it is purified by agitating it first with water, and then with sulphuric acid, and, lastly, submitting it to distillation.

Prop., &c. Colourless; sweet-tasted; agreeably fragrant, the odour approaching that of oil of caraway; slightly soluble in water; freely so in alcohol and ether; it sinks in water; boils at 180° Fahr.; burns with a smoky greenish flame; is unaffected by oil of vitriol; but decomposed by solution of caustic potassa. It combines with chlorine, forming new compounds. See CHLORIDES OF CARBON (page 294).

O′LEIC ACID. $HC_{18}H_{33}O_2$. *Syn.* ELAIC ACID. One of the fatty acids discovered by Chevreul, and produced by saponifying oils, and then separating the base from the resulting soap by means of a dilute acid. It now forms an important secondary product in the manufacture of stearic acid. Perfectly pure oleic acid may be obtained as follows:—

1. By saponifying olein, as just noticed.

2. Pure almond or olive oil soap is decomposed by a dilute acid, and the resulting oily acid is digested in a water bath with half its weight of litharge (in very fine powder) for some hours, constantly stirring; the mixture is then agitated with twice its volume of ether in a close vessel, and in 24 hours the clear ethereal solution is decanted, and decomposed with dilute hydrochloric acid; the oleic acid separates, and the ether mixed with it is expelled by evaporation. To render it colourless, the acid is again saponified with caustic soda, and the soap thus obtained is repeatedly dissolved in a solution of soda, and as often separated by adding common salt; this soap is, lastly, decomposed by dilute hydrochloric acid, as before.

Prop. &c. A colourless oily acid, insoluble in water, soluble in alcohol, ether, and oil; with the bases, it forms salts called oleates.

O′LEIN. $C_{57}H_{104}O_6$. *Syn.* ELAIN; HUILE ABSOLUE, Fr. The liquid portion of the fixed oils and fats. By saponification, it yields oleic acid.

Prep. 1. Olive oil or almond oil is digested for 24 hours with a quantity of caustic soda lye, only sufficient to saponify one half of the oil, and the undecomposed oily portion (olein) is then separated from the alkaline solution and newly formed stearine soap.

2. The saponified mixture of oil and alkali (see No. 1) is digested with proof spirit until all the soap is dissolved out, and the olein separates and floats on the surface; the latter, after repose, is decanted.

3. Almond or olive oil is agitated in a stout bottle with 7 or 8 times its weight of strong alcohol (sp. gr. ·798), at nearly the boiling-point, until the whole is dissolved; the solution is next allowed to cool, after which the clear upper stratum is decanted from the stearin which has been deposited, and, after filtration, the spirit is removed by distillation at a gentle heat; by exposure at a very low temperature, it deposits any remaining stearin, and then becomes pure.

Prop., &c. The products of the last two formulæ have only a very slight yellow colour, but may be rendered quite limpid and colourless by digestion for 24 hours with a little pure, freshly burnt animal charcoal, and subsequent filtration. In this state the olein is perfectly neutral to test paper, does not in the slightest degree affect metallic bodies immersed in it, and does not thicken by exposure to the greatest cold. Olein is used by watchmakers for their fine work. Some years ago the product of the last formula was sold, by a certain metropolitan house, as 'watchmaker's oil,' at 1s. 6d. a drachm. Commercial olein is generally lard oil. The refined oleic acid of the stearin works also commonly passes under the name. Olein burns well in lamps; but oleic acid does not do so unless when well refined and when the wick-tube is so formed as to remain cool. See LARD OIL and OLEIC ACID.

OLEOM′ETER. *Syn.* ELAÏOMETER, ELEOMETER, OIL-BALANCE. A delicate areometer or hydrometer, so weighted and graduated as to adapt itself to the densities of the leading fixed oils. As the differences of the specific gravities of these substances are inconsiderable, to render it more susceptible the bulb of the instrument is proportionately large, and the tube or stem very narrow. The scale of the oleometer in general use (Gobby's) is divided into 50 degrees, and it floats at 0 or zero in pure poppy oil, at 38 or 38½ in pure almond oil, and at 50 in pure olive oil. The standard temperature of the instruments made in this country is now 60°; those made on the Continent, 54·5 Fahr. The oil must therefore be brought to this normal temperature before testing it, by plunging the glass cylinder containing it into either hot or cold water, as the case may be; or a correction of the observed density must be made. The last is done by deducting 2 from the indication of the instrument for each degree of the thermometer above the normal temperature of the instrument, and adding 2 for every degree below it. Thus; suppose the temperature of the oil at the time of the experiment is 60° Fahr., and the oleometer indicates 61°; then—

60·0° Actual temperature.
54·5 Normal temperature.

5·5 Difference.

Indication of the oleometer . . 61·0
The difference 5·5 × 2 = . . 11·0

Real density . . . . 50·0

Suppose the temperature observed at the time of the experiment is 52°, and the oleometer indicates 45°; then—

54·5 Normal temperature.
52·0 Actual temperature.

2·5 Difference.

Indication of the oleometer . . 45·0
The difference 2·5 × 2 = . . 5·0

Real density . . . . 50·0

The oil is, therefore, presumed to be pure. See HYDROMETER, OILS (Fixed), and SPECIFIC GRAVITY.

O'LEO-PHOSPHOR'IC ACID. An acid compound found by Fremy in the brain and nervous matter.

OLEO-RES'INS. The natural compounds of resin and essential oil forming the vegetable balsams and turpentines. Copaiba, Canada balsam, and Venice turpentine, are examples. Certain extracts prepared with ether, as the fluid extracts of cubebs and pepper in the Ph. U. S., may be regarded as oleo-resins. See EXTRACT.

OLEOSAC'CHARUM. *Syn.* ELÆOSACCHARUM. Sugar aromatised or medicated by being rubbed up with an essential oil. The oleosacchara of aniseed, caraway, cinnamon, peppermint, pennyroyal, and the other like essential oils, are made by rubbing 15 to 20 drops of the respective oils with white sugar, 1 oz.—The Ph. Græca 1837 prescribes 1 part of oil to 20 parts of sugar.—The Ph. Austr. 1836 and Ph. Bor. order the same proportions, or 3 drops of oil to the dr., and 24 drops to the oz., of powdered sugar. When intended for making extemporaneous distilled waters, 1 dr. of magnesia is a common addition. The oleosacchara of citrons, lemons, oranges, &c., are made from the pèels, as follows:—After cleaning off any specks in the outer rind of the fruit, rub a large piece of loaf sugar on it until the yellow rind is completely removed. Those parts of the sugar which are impregnated with the essence are, from time to time, to be cut away with a knife, and put into an earthen pot. The whole being thus taken off, the sugared essence (oleosaccharum) is to be closely pressed down in the pot, tied over with bladder, and preserved in a cool place for use.

OLIB'ANUM. *Syn.* OLIBAN, INDIAN OLIBANUM, FRANKINCENSE. A gum resin obtained from *Boswellia thurifera* or *serrata.* It is stimulant, astringent, and diaphoretic. It is burnt as incense in the temples of India and in Roman Catholic churches. African or Arabian olibanum is produced by *Boswellia floribunda.* (Royle.) This substance must not be confounded with the resin noticed at page 541.

OL'IVE. *Syn.* OLEA, OLIVA, L. The *Olea Europæa* (Linn.), a native of the South of Europe. The unripe fruit is preserved in brine (SPANISH OLIVES, FRENCH OLIVES); the ripe fruit furnishes olive oil; the bark is bitter, astringent, and febrifuge, and has been used as a substitute for cinchona bark; it yields a gum-like substance (OLIVE GUM), which was formerly reported vulnerary, and contains olivile. The olive tree has in all ages been held in peculiar estimation, as the bounteous gift of heaven to man. Some authors have styled it "a mine on earth." It is remarkable for yielding a fixed oil from the pericarp, instead of from the seed.

OLLIVIER'S BISCUITS. See PATENT MEDICINES.

OM'ELET. *Syn.* OMELETTE, Fr. A variety of pancake or fritter made of eggs and other ingredients. Omelets may contain bacon, ham, herbs, fish, shell-fish, cold meat, cold game, fruit, or anything else at hand at the pleasure of the cook. 'Spirit omelets' are made by pouring a little brandy, rum, or whisky over them on serving them up, and setting it on fire for a moment just before placing the dish on the table. "Where is the man or woman cook but says they know how to make an omelette, and that to perfection? But this is rarely the case. It is related of Sarah, the Duchess of Marlborough, that no one could cook a 'fraise,' as it was then called, for the great duke but herself. The great point is, if in an iron pan, it should be very clean and free from damp, which sometimes comes out of the iron when placed on the fire. The best plan is to put it on the fire, with a little fat, and let it get quite hot, or until the fat burns; remove it, and wipe it clean with a dry cloth, and then you will be able to make the omelette to perfection." (Soyer.)

The following formula for a plain omelet is by the above culinary authority:—"Break four eggs into a basin, add ½ teaspoonful of salt and ¼ do. of pepper, and beat them up well with a fork; put into the frying-pan 1½ oz. of butter, lard, or oil, place it on the fire, and, when hot, pour in the eggs, and keep on mixing them quickly with a spoon until they are delicately set; then let them slip to the edge of the pan, laying hold by the handle, and raising it slantways, which will give an elongated form to the omelette; turn in the edges, let it rest a moment, to set, turn it over on to a dish, and serve." "It ought to be of a rich-yellow colour, done to a nicety, and as light and delicate as possible." "2 table-spoonfuls of milk and 1 oz. of the crum of bread, cut into thin slices, may be added."

MIXED and FANCY OMELETS are made by simply dropping the ingredients, cut into dice or fragments, into the above. ANCHOVY, OYSTER, and SHRIMP OMELETS are generally prepared by placing a few spoonfuls of the respective sauces in the centre of each, when nearly dressed.

ONGUENT (de la Mere). A stimulant and digestive ointment, very popular in French pharmacy.

Prep. (P. Cod.) Black pitch, 1 part; butter, lard, litharge, suet and yellow wax, 4 parts; olive oil, 8 parts.

ON'ION. *Syn.* CEPA, L. The bulb of *Allium Cepa*. The onion is diuretic, expectorant, rubefacient, and stimulant. The juice, made into a syrup with sugar (SYRUPUS CEPÆ), has been given in chronic catarrh, diarrhœa, croup, dropsy, and calculus. Roasted and split open, onions have been applied as poultices to suppurating tumours, and applied to the pubes to relieve suppression of urine in children. According to Dr. Cullen, "onions are acrid and stimulating, and possess little nutrient power. In bilious constitutions they generally produce flatulence, thirst, headache, and febrile symptoms; but where the temperament is phlegmatic, they are of infinite service, by stimulating the system, and promoting the excretions, particularly expectoration and urine." They also possess antiscorbutic and soporific properties.

O'NYX. A sub-species of quartz often wrought into small ornamental articles. Among jewellers, any stone exhibiting layers of two or more colours, strongly contrasted, is called an 'onyx.' A regularly and richly banded agate of this class is much prized for cameos. See GEMS.

O'PAL. A mineral allied to agate and chalcedony, but distinguished by its peculiar resinous lustre. The variety most admired as a gem is the precious or noble opal, which is remarkable for its beautiful play of colours. See GEMS and PASTES.

OPHTHAL'MIA. *Syn.* OPHTHALMITIS, L. Inflammation of the eye. In ordinary cases this disease is confined to the external membrane of the globe of the eye, or to the eyelids; but it occasionally attacks the sclerotica, cornea, choroid coat, and retina.

The common causes of ordinary or conjunctival ophthalmia are the sudden exposure of the organ to a cold easterly wind, to dust, gritty particles, or to any external irritation or injury.

The symptoms are, in part, those common to local inflammation. The eye or eyelids become more or less bloodshot, swollen, and tender, and a sensation resembling that induced by the presence of particles of sand or some gritty substance, accompanied by much heat and a pricking pain, is almost constantly experienced. The secretion becomes yellowish and glutinous, and during the night frequently glues, as it were, the lids together. Sometimes only one eye is attacked, but after 2 or 3 days the disease extends to the other.

The treatment of mild cases of conjunctival ophthalmia is extremely simple. In general, it may be relieved by fomentations of warm water or decoction of poppy-heads and the use of aperient medicines, to which leeches and cupping may often be added with advantage. Severe cases should be treated by the medical practitioner only.

O''PIATES. *Syn.* OPIATA, L. Preparations containing opium. The word is often applied in a general sense to anodynes and soporifics. In French pharmacy, the name is commonly used synonymously with confections, as in the following preparations:—

ANTI-DYSENTERIC OPIATE—Quarin. Purified opium, 4 grs.; ipecacuanha, ½ dr.; tormentilla, 1 dr.; syrup of whortleberries and conserve of red roses, of each, 6 drs.—*Dose.* A teaspoonful every hour.

ANTI-HYSTERICAL OPIATE—Trousseau and Reveil. Powdered indigo, 1 oz.; white honey, 3 oz.—*Dose.* 1 table-spoonful daily, gradually increased until the whole is taken in a day. In hysteria, epilepsy, and nervous affections of an epileptic character.

BALSAMIC OPIATE—Trousseau and Reveil. Oleo-resin (balsam) of copaiba, 1 oz.; cubebs (in powder), 3 oz.; potassio-tartrate of iron, 2½ drs.; syrup of quince, q. s. In gleet.—*Dose.* 3 boluses the size of a nut, thrice daily.

CHARCOAL OPIATE—Ratier. Willow charcoal (recent), 1 oz.; prepared chalk, 1 dr.; powdered white sugar, 2 oz.; rose water, q. s. to form an electuary. In diarrhœa and incipient cholera, in dysentery with fetid stools, and in gastralgia, flatulence, &c. By substituting calcined magnesia for chalk, it becomes an excellent remedy for habitual constipation.

CUBEB OPIATE—Deyeaux. Powdered cubebs, 4 drs.; powdered camphor, 1 dr.; mix, and divide it into 18 powders.—*Dose.* One, 3 or 4 times daily, in gleet, painful and scalding micturition, &c.

O'PIUM. *Syn.* OPIUM (B. P., Ph. L. E. & D.), L. The juice inspissated by spontaneous evaporation, obtained by incision from the unripe capsules of the *Papaver somniferum*, grown in Asia Minor.

Var.—1. EGYPTIAN; in roundish flattened lumps; inferior to Turkish opium.—2. ENGLISH; often equal to the best Smyrna.—3. FRENCH; resembles the last.—4. GERMAN; similar to English opium.—5. INDIAN;—*a.* BENARES, in large balls;—*b.* MALWA, in roundish flattened cakes, of 9 or 10 oz. in weight each;—*c.* PATNA, in balls or square cakes; inferior to Turkey opium.—6. LEVANT; same as Smyrna opium.—7. PERSIAN; in rolls or sticks, 6 × ½ inch; inferior; resembles hepatic aloes in appearance.—8. SMYRNA; in irregular, rounded, flattened pieces, varying in weight from 2 or 3 lbs. to only as many oz. It forms the best variety of Turkey opium, and is particularly rich in morphia. It is the only one adapted for the manufacture of the salts of morphia, as it contains on the average from 7 to 9% of that alkaloid, and usually yields about 12 to 12·5% of hydrochlorate of morphia, which is more than can be obtained from any other variety of opium.—9. TURKEY; of which two varieties are known in commerce, viz., Constantinople opium and Levant or Smyrna opium, noticed above. Constantinople opium is generally in small, flattened, roundish cakes, 2 to 2½ inches in diameter, and covered with poppy leaves. It is more mucilaginous and less esteemed than Smyrna opium, from which it may be distinguished by the last being always covered with the reddish capsules of a species of Rumex.

Pur. The opium of commerce is not unfrequently adulterated with extract of poppies, extract of lettuce, lactucarium, mucilage of gum tragacanth, dried leaves, starch, water, clay, sand, gravel, and other substances, in order to increase its weight. This fraud is readily detected by inspection, by chemical analysis, and the microscope; and indirectly, with the greatest certainty, by a simple assay of the sample for its morphia (morphiometry). This may be effected by one or other of the following methods:—

1. (Couerbe.) Opium, 4 parts, and quicklime, 1 part, made into a milk with water, q. s., are boiled together, and the solution filtered whilst hot; dilute hydrochloric acid is then added, to saturation, and the morphia precipitated by the addition of ammonia, any excess of the latter being expelled by heat; the precipitate is then collected, dried, and weighed. If 100 grs. have been operated on, the given weight will represent the per-centage richness of the sample in morphia (nearly).

2. (Guilliermond.) 100 grs. of opium are triturated for some time in a mortar along with 4 times its weight of rectified spirit, and the tincture strained through linen, with expression, into a wide-mouthed bottle; the marc is triturated a second time with about 3 times its weight of alcohol, and the tincture strained into the bottle as before; to the mixed tincture is added a fl. dr. of liquor of ammonia, and the whole is agitated for a short-time. In about 12 hours the morphia spontaneously separates, accompanied with some narcotina and meconate of ammonium; the morphia covering the interior of the vessel with large, coloured, and gritty crystals, feeling like sand, and the narcotina crystallising in very light, small, white, and pearly needles. These crystals are washed with water, either through a paper filter or linen, to free them from the meconate of ammonia which they contain; after which the narcotina is separated from the morphia by decantation in water, which removes the narcotina, which is the lighter of the two. According to M. Mialhe, however, the morphia is more effectually removed by washing the crystals with 1 to 1½ fl. dr. of ether, by triturating the two together, when the morphia is left in an insoluble state, and may then be dried and weighed.

3. (Ph. E.) Macerate 100 grs. of opium for 24 hours in 2 fl. oz. of water, filter, and strongly squeeze the residue; then precipitate the infusion with carbonate of sodium, ½ oz., dissolved in cold water, 2 fl. oz.; gently heat the precipitate until it shrinks and fuses, then cool and weigh it. It should weigh at least 10 grs., and, when powdered, be entirely soluble in a solution of oxalic acid. See also Watts' 'Dic. of Chemistry,' article, OPIUM.

Tests. These depend chiefly on the chemical and physical characters of morphia and meconic acid, the tests for which have been already noticed. In operating upon the contents of the stomach, or upon solid organs, in cases of suspected poisoning, the best method of proceeding is that already described under ALKALOID.

Another method is to boil the substances in water slightly acidulated with acetic acid, next to evaporate the solution to the consistence of a thick syrup, and then to treat it twice with boiling rectified spirit; the tincture thus obtained is to be filtered when cold, and again evaporated to the consistence of syrup; it is now re-dissolved in distilled water, the filtrate treated with solution of subacetate of lead, and the precipitate of meconate of lead, separated by filtration, and carefully preserved. A current of sulphuretted hydrogen is then passed through the solution, to precipitate excess of lead, and after again filtering it the liquid is evaporated, at first in a water bath, and afterwards under the receiver of an air-pump. The shapeless mass of crystals thus obtained present all the characters of morphia, if the substance examined contained opium. In the mean time the precipitate of meconate of lead is to be boiled with water acidulated with sulphuric acid, and the insoluble sulphate of lead separated by filtration; the filtered liquid, by evaporation, furnishes meconic acid, either under the form of crystals or an amorphous powder, the solution of which precipitates ferric salts of a deep blood-red.

The following are additional tests to those already noticed:—

1. From the peculiar odour of opium, often perceptible when the drug has been taken only in very small quantities.

2. A solution containing crude opium is turned of a deep red colour, or, if coloured, it is turned of a reddish-brown, and is darkened, by tincture of ferric chloride.

3. (Hare.) A portion of the suspected liquid is poured into a beaker glass, and a few drops of solution of acetate of lead are added to it; the whole is stirred frequently for 10 or 12

hours, and then allowed to settle, after which the supernatant liquid is decanted; 20 or 30 drops each of dilute sulphuric acid and solution of ferric sulphate are next poured on the precipitate (meconate of lead), when a deep and beautiful red colour will be developed, if the original liquid contained opium.

4. (Dr. Riegct.) The suspected substance is mixed with some potassa, and is then agitated with ether; a strip of white unsized paper is next several times moistened with the solution, and when dry it is re-moistened with hydrochloric acid, and exposed to the steam of hot water. The paper assumes a red colour, more or less deep, if opium is present.

Uses, &c. Opium is one of the most valuable substances employed in medicine. In small doses it acts as a powerful and diffusible stimulant, in somewhat larger ones it is narcotic, and in excessive doses it proves an active narcotic poison. It is also anodyne, antispasmodic, diaphoretic, soporific, and sedative, its peculiar action being greatly modified by the dose and the condition of the patient. Its action as a stimulant is followed by sedative effects, which are, in general, much more marked than could be expected from the degree of previous excitement it induces. It is employed to fulfil a variety of indications—to procure sleep, to lull pain, allay irritation, check morbid discharges, alleviate cough and spasm, &c. &c. It also, when judiciously administered, renders the body less susceptible of external impressions, as those of cold, contagion, &c.; but it is injurious when the pulse is high, the heat of the body above the natural standard, and the skin dry, or when there is a disposition to local inflammation or congestion. When applied externally, in the form of frictions, liniments, ointments, &c., it is absorbed, and produces similar effects to those produced by swallowing it, but in this way it requires to be used in larger quantities.—*Dose.* As a stimulant, ¼ gr., every 2 or 3 hours; as an anodyne and antispasmodic, ½ to 1 gr.; as a soporific, ½ to 2 grs.; in violent sposms, neuralgia, acute rheumatism, &c., 2 to 4 grs., increased in delirium tremens, hydrophobia, mania, tetanus, &c., to several times that quantity, according to circumstances.

The use of opium as a stimulant and intoxicant is common among the nations of the East. The Turks chew it, and the Chinese smoke a watery extract of it, under the name of 'chundoo.' Of late years opium-eating and laudanum-taking have, unfortunately, been greatly on the increase in this country, and the employment of this drug as a soporific for infants and young children has become so general amongst the poor and dissipated as to call for the interference of the legislature. The first effect of opium, as a stimulant, is to excite the mental powers and to elevate those faculties proper to man; but its habitual use impairs the digestive organs, induces constipation, and gradually lessens the energy of both the mind and body. In excessive quantities, it destroys the memory, induces fatuity and a state of wretchedness and misery, which after a few years is cut short by a premature death. In this respect the effects of the excessive use of opium closely resembles those of fermented liquors.

Pois.—Symptoms. Headache; drowsiness; stupor; frightful reveries; vertigo; contracted pupil (generally); scanty urine; pruritus or dry itching of the skin, often accompanied by a papular eruption; thirst; dryness of mouth and throat; weak and low pulse; vomiting; respiration, generally, natural. Sometimes the drowsiness or sleep is calm and peaceful.—*Ant., &c.* Vomiting must be induced as soon as possible, by means of a strong emetic and tickling the fauces. If this does not succeed, the stomach-pump should be applied. The emetic may consist of a ½ dr. of sulphate of zinc dissolved in ½ pint of warm water, of which one third should be taken at once, and the remainder at the rate of a wine-glassful every 5 or 10 minutes, until vomiting commences. When there is much drowsiness or stupor, 1 or 2 fl. drs. of tincture of capsicum will be found a useful addition; or one of the formulæ for emetic draughts given at page 412 (especially No. 7) may be taken instead. Infusion of galls, cinchona, or oak-bark, should be freely administered before the emetic, and water soured with vinegar and lemon-juice, after the stomach has been well cleared out. To rouse the system, spirit-and-water, or strong coffee, may be given. To keep the sufferer awake, rough friction should be applied to the skin, an upright posture preserved, and walking exercise enforced, if necessary. When this is ineffectual, cold water may be dashed over the chest, head, and spine, or mild shocks of electricity may be had recourse to. To allow the sufferer to sleep is to abandon him to destruction. Bleeding may be subsequently necessary in plethoric habits, or in threatened congestion. The costiveness that accompanies convalescence may be best met by aromatic aperients; and the general tone of the habit restored by stimulating tonics and the shower bath. The smallest fatal dose of opium in the case of an adult, within our recollection, was 1½ grs. Children are much more susceptible of the action of opium than of other medicines, and hence the dose of it for them must be diminished considerably below that indicated by the common method of calculation depending on the age. See DOSES, &c.

Concluding remarks. Opium is a very complicated substance, and contains a number of alkaloids and other proximate vegetable principles, besides a certain portion of saline matter. The substances already detected in it are caoutchouc, codein, fatty matter, lignin, meconic acid, meconia, morphia, narceia, narcotia, odorous matter, opiania, papaverin, pseudomorphia (?), porphyroxin, resin, saline matter, &c. It is doubtful, however, whether ıme of these substances are not generated from :her principles existing in opium, during the rocesses adopted to obtain them.

According to Mulder, 100 parts of ordinary ıyrna opium contain—

Morphia	10·842
Codeia	·678
Narcotia	6·808
Narceia	6·662
Meconia	·804
Meconic acid	5·154
Resin	3·582
Gummy matter	26·242
Mucus	19·086
Fatty matter	2·166
Caoutchouc	6·012
Water	9·846
Matter undetermined and loss	2·118
	100·

The sp. gr. of Smyrna opium is 1·336.

⁂ The following preparations, once famous, e now nearly obsolete in this country. Those at are made with cold water, or by fermenta- ɔn, are supposed to be milder than crude ium, and in this respect to be similar to LACK DROP.'

Opium, Homberg's. Opium exhausted by peated coction in 10 or 12 times its weight water, and the mixed liquors evaporated to ıe third, and kept boiling for 2 or 3 days, ding water from time to time, then strain- g and evaporating to a pilular consistence. AUMÉ'S PURIFIED OPIUM is similar.

Opium, Launcelotte's. Opium, 1 lb.; quince ice, 1 gall.; pure potassa, 1 oz.; sugar, 4 oz.; rment for some time, evaporate to a syrup, gest in rectified spirit, filter, and evaporate e tincture.

Opium, Let'tuce. Lactucarium.

Opium, Neumann's. Infusion of opium, rained, mixed with a little sugar, and fer- ented for some months in a warm place; ıd, lastly, strained and evaporated to an tract, or preserved in the liquid form.

Opium, Powell's. Opium, exhausted by coc- ɔn with water, the residuum treated with irit of wine, and the mixed tincture and de- ction evaporated to an extract.

Opium, Pu''rified. *Syn.* OPIUM PURIFICA- ΓM, L. The purified opium of old pharmacy now represented by the aqueous extract of e Pharmacopœias. (See *page* 498.) For- erly, picked opium, beaten to a pilular con- tence, with the addition of a little water or oof spirit, was called 'SOFT PURIFIED OPIUM' PIUM PURIFICATUM MOLLE); and picked ium dried in a water bath until brittle ough for powdering, was called 'HARD PURI- ED OPIUM' (O. P. DURUM). CORNETTE'S and E'S PURIFIED OPIUM are similar to the tract of Ph. L.

Opium, Quercetan's. Vinegar of opium eva- rated to an extract.

Opium, Strained. *Syn.* EXTRACTUM THEBAICUM, OPIUM COLATUM, OPIUM PURIFICATUM, L. Opium dissolved or softened in an equal weight of water, passed through canvas, and evaporated to the consistence of an extract. It is now superseded by the aqueous extract.

Opium, Tor'refied. *Syn.* ROASTED OPIUM; OPIUM TORREFACTUM, L. Opium, dried, cut into thin slices, and roasted on an iron plate, at a low heat, as long as it emits vapours, care being taken not to burn it.

OPODEL'DOC. 1. See LINIMENT OF SOAP.

2. (STEER'S OPODELDOC.) This, which differs from common opodeldoc chiefly in containing more soap, is prepared as follows:—

a. White Castile soap (cut very small), 2 lbs.; camphor, 5 oz.; oil of rosemary, 1 oz.; oil of origanum, 2 oz.; rectified spirit, 1 gall.; mix, and digest in a strong bottle (closely corked), by the heat of a water bath, until solution is complete; when the liquid has considerably cooled, add of liquor of ammonia, 11 oz., and immediately put it into wide-mouthed bottles (Steer's), cork them close, and tie them over with bladder. Very fine, solid and transparent when cold.

b. Soap, 4 oz.; camphor, 1 oz.; oil of rosemary and origanum, of each, 1 dr.; rectified spirit, 1 pint; liquor of ammonia, 1½ fl. oz.; mix.

c. (Phil. Col. of Pharm.) White soap, 28 oz.; camphor, 8 oz.; rectified spirit, 6½ pints; dissolve, suffer the impurities to subside, add of liquor of ammonia, 4 fl. oz.; oils of rosemary and horsemint, of each, 1 fl. oz.; and pour it into phials, as before.

ORANGE. *Syn.* AURANTIUM, L. The common SWEET ORANGE is the fruit of *Citrus Aurantium.* The SEVILLE or BITTER ORANGE is produced by *Citrus vulgaris* or *Bigaradia.*

Oranges are probably about the most wholesome and useful of all the subacid fruits. Their juice differs from that of lemons chiefly in containing less citric acid and more sugar. In their general properties the two are nearly similar.

FACTITIOUS ORANGE JUICE is made by dissolving citric acid, 1 oz., and carbonate of potassa, 1 dr., in water, 1 quart, and digesting the solution on the peel of half an orange, until sufficiently flavoured; Narbonne honey or white sugar is then added to impart the necessary sweetness. Instead of orange peel, 5 or 6 drops of oil of orange peel, with ¼ fl. oz. of tincture of orange peel, may be used.

ORANGE PEEL (CORTEX AURANTII) is an agreeable, stomachic, bitter tonic, especially useful as an adjunct to more active medicines. That ordered to be used in medicine is the exterior (yellow) rind of the *Citrus Bigaradia*, or bitter orange, dried in the months of February, March, or April. See CANDYING, INFUSION, ISSUE PEAS, OILS (Volatile), &c.

ORANGEADE'. *Syn.* ORANGE SHERBET. From oranges or orange flavour, in the same way as LEMONADE from lemons, &c.

OR'ANGE CHROME. *Prep.* 1. From a solution of chromate of potash and diacetate of lead, as chrome yellow.

2. From chrome yellow or chromate of lead, by acting on it with a weak alkaline lye until sufficiently darkened. *Used* as a pigment.

ORANGE DYES. These are produced from mixtures of red and yellow dyes in various proportions; or by passing the cloth, previously dyed yellow, through a weak red bath. A very good fugitive orange may be given with annotta, by passing the goods through a solution made with equal parts of annotta and pearlash, or, still better, through a bath made of 1 part of annotta, dissolved in a lye of 1 part each of lime and pearlash, and 2 parts of soda. The shade may be reddened by passing the dyed goods through water acidulated with vinegar, lemon juice, or citric acid, or through a solution of alum. The goods are sometimes passed through a weak alum mordant before immersion in the dye-bath. See ANNOTTA, DYEING, &c.

ORANGE RED. *Syn.* SANDIX. From white lead, by calcination, in a nearly similar manner to that by which red lead is prepared from the protoxide. Brighter than red lead; *used* wholly as a pigment.

OR'ANGERY. The gallery, building, or enclosure in a garden, in which orange trees are preserved or cultivated, to shield them from the effects of the external winter, or to assist their growth by artificial heat.

OR'CHARD. See CIDER.

OR'CEIN. $C_7H_7NO_3$. *Syn.* LICHEN LAKE. A brownish-red powder, obtained by dissolving orcin in ammonia, exposing the solution to the air, and then precipitating with dilute acetic acid. It is nearly insoluble in water, but dissolves freely in solutions of ammonia and the fixed alkalies, with the production of a rich purple or violet colour. It probably constitutes the leading tinctorial ingredient in ARCHIL, CUDBEAR, and LITMUS. (See *below.*)

OR'CHIL: See ARCHIL.

OR'CIN. $C_7H_8O_2$. The general product of the decomposition of the acids obtained from the tinctorial lichens under the influence of heat or the alkaline earths.

Prep. 1. The powdered lichen is treated with boiling alcohol, the tincture filtered whilst hot, and again after it has become cold; the alcohol is then removed by distillation, and the remainder evaporated to the consistence of a syrup; this is redissolved in water, and the solution is again filtered and evaporated to a syrup; it is then set aside some days, in a cool place, and the crystals of orcin which form are collected, and dried by pressure in bibulous paper. Impure.

2. Lecanoric or orsenillic acid (impure will do) is boiled in baryta water, and the excess of baryta is precipitated by carbonic acid; the filtered liquid is then evaporated to a small bulk, and set aside to crystallise, as before.

Prop., &c. Large, square, prismatic crystals; slightly yellowish; intensely sweet; very soluble in both water and alcohol; melts to a syrupy liquid, and then distil unchanged. Alkalies decompose it; when exposed to the air, it gradually reddens. (See *above.*)

OR'ELLIN. A yellow colouring matter contained together with bixin in annotta. It is soluble in water and in alcohol, slightly soluble in ether, and dyes alumed goods yellow. Also the name sometimes given to purified annotta. The commercial annotta is dissolved in an alkaline solution, either caustic or carbonated, and then precipitated by an acid.

ORES. The mineral bodies from which metals are obtained. The processes adopted for this purpose constitute OPERATIVE METALLURGY; those by which their value is determined, MINERAL ASSAYING. The last only will be noticed here.

Assay. Three general methods are adopted for this purpose:—

1. (MECHANICAL.) This consists in pulverising the ore by any convenient method, and expertly washing a given weight of it (say 100 grs.) in a wooden bowl or capsule with water, so as to remove the earthy gangues from the denser and valuable metallic matter in such a way that none of the latter may be lost. This is the common plan adopted with auriferous sands, the ores of tin after they have passed the stamping-mill, galena, gray antimony, &c., and may either be employed as an independent process or merely as preparatory to more exact investigations. When galena is thus tested, the product is a nearly pure sulphide of lead, of which every grain is equivalent to ·8666 of metallic lead, the rest being sulphur. The results with gray antimony ore are still more direct, since the product is only melted into pigs before being sent to market. In this state it contains 73% (nearly) of metallic antimony.

2. (HUMID.) Assays in the 'humid way' are true chemical analyses, and are described under the head '*Estim.*' attached to most of the more important minerals noticed in this work. This plan offers greater facilities and gives more accurate results than either of the other methods.

3. (DRY.) Of the methods of assay in the 'dry way,' the following are the most accurate, generally useful, and easily applied:—

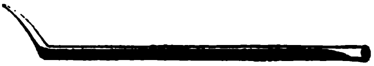
a. (Dr. Abiche.) The mineral is reduced to powder, and mixed with 5 or 6 times its weight of carbonate of barium, also in powder; the mixture is fused at a white heat in a platinum crucible, and the resulting slag, after being powdered, is exhausted with hydrochloric acid. This process answers well with both stony and metallic minerals, the most refractory of which give way under this treatment.

b. (Liebig.) Into a crucible containing commercial cyanide of potassium, a weighed quantity of the ore, in the state of fine powder, is sprinkled, when the metallic oxides and sulphides which it contains are almost immediately reduced to the metallic state, and may be separated from the scoria by edulcoration with water. With the oxides and sulphides of antimony and tin, this reduction occurs at a dull red heat; with the compounds of copper, it occurs with the disengagement of light and heat; but an ore of iron requires to be mixed with a little carbonate of potassium or of sodium before throwing it into the fused cyanide, and to be then submitted to a full red heat for a short time, before it is reduced to the reguline state. In this case any manganese present in the ore of iron is left under the form of protoxide. A mixture of about equal parts of dry carbonate of sodium and cyanide of potassium answers better for the crucible than the cyanide alone. See ALLOYS, METALLURGY, &c.; also PERCY'S METALLURGY.

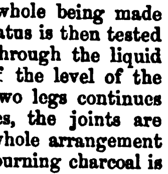
ORGAN'IC BA'SES. These interesting bodies may be divided into two classes: the first comprising those which occur ready formed in nature (ALKALOIDS); and the second, those produced by artificial processes in the laboratory (ARTIFICIAL ALKALOIDS, ARTIFICIAL ORGANIC BASES). They all contain the element NITROGEN. The natural bases have already been described under ALKALOID (which *see*). The bases of artificial origin are mostly volatile, and their constitution is much simpler than that of the native bases. Of the vast number which have been formed, the following are, perhaps, the most interesting:—ETHYLAMINE, METHYLAMINE, AMYLAMINE, ANILINE, NAPHTHYLAMINE, CHINOLINE, and PICOLINE. These and other bodies of the class are noticed under their respective heads.

ORGAN'IC SUBSTANCES. We have reserved a notice of the methods of estimating the quantity of carbon, hydrogen, oxygen, and nitrogen, in organic compounds, until now, in order to present them to the reader in a more useful and connected form. The operation essentially consists, in respect of the first three, in causing the complete combustion of a known quantity of the substance under examination, in such a manner that the carbonic acid and water thus produced shall be collected, and their quantity determined. From these the proportions of their elements are easily calculated. The estimation of the quantity of nitrogen (as is also the case with chlorine, phosphorus, sulphur, &c.) requires a separate operation. The two great classes of organic bodies (azotised and non-azotised) are readily distinguished from each other by heating a small portion with some solid hydrate of potassa, in a test tube. If nitrogen is present, it is converted into ammonia, which may be recognised by its characteristic odour and its alkaline reaction.

1. *Estimation* of the CARBON, HYDROGEN, and OXYGEN.—*a.* The method of Prof. Liebig, now almost exclusively adapted for this purpose, is as follows:—The substance under examination, reduced to powder, is rendered as dry as possible, either by the heat of a water bath or by exposure over concentrated sulphuric acid, *in vacuo*; 5 or 6 grs. of it are then weighed in a narrow open test tube, 2 or 3 inches long, and to ensure accuracy this tube and any little adhering matter is again weighed after its contents have been removed—the difference between the two weights being regarded as the true quantity of the substance employed in the experiment. A 'combustion tube,' of hard white Bohemian glass (·4 to ·5 inch diam.; 14 to 18 inches long), is next taken, and about 2-3rds filled with black oxide of copper, prepared by the ignition of the nitrate, and which has been just reheated to expel hygrometric moisture. Nearly the whole of this oxide, whilst still warm, is then gradually poured from the tube and triturated with the organic sample in a dry and warm mortar, after which the mixture is transferred to the combustion tube, and the mortar being rinsed out with a little fresh oxide, which is added to the rest, the tube is, lastly, nearly filled with some warm oxide fresh from the crucible. The contents of the tube are next arranged in a proper position by a few gentle blows, so as to leave a small passage for the evolved gases from the one end of the tube to the other. (See *engr.*)

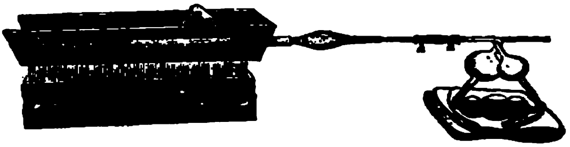


The 'combustion tube' with its 'charge' is next placed in a 'furnace' or 'chauffer' of thin sheet iron (see figure *next page*). Its open end is then connected with a 'drying tube' filled with fragments of fused chloride of calcium, and carefully weighed.



This tube is, in its turn, connected with a small glass ('Liebig's potash bulbs') containing solution of pure potassa of sp. gr. 1·27, also carefully weighed. The junction with the first is made by means of a perforated cork; that with the second, by means of a small tube of India rubber tied with silk, the whole being made quite air-tight. The apparatus is then tested by sucking a few bubbles through the liquid with the dry lips, when, if the level of the solution of potassa in the two legs continues unequal for some minutes, the joints are regarded as perfect. The whole arrangement being complete (see *engr.*), burning charcoal is now placed in the furnace around the front part of the combustion tube, and when this has become red-hot the screen is slowly moved back, and more burning charcoal is added, until the furthest extremity of the tube has been exposed to its action. (Gas, burned in furnaces specially contrived for the purpose, is now usually employed instead of charcoal.) The firing is so regulated that the gas enters the potassa apparatus in bubbles easily counted, slightest retrogade action is observed, the charcoal is removed from the combustion tube, and the extreme point of this last is broken off. A little air is then sucked through the apparatus in order to seize on any remaining carbonic-acid gas and moisture. The potash

without any violence or inconvenienc
is kept up as long as gas is extricat
soon as the operation is complete,
apparatus and the chloride of calciu
are, lastly, detached, and again ac
weighed. The increase in the weight
first gives the weight of the carbon
formed during the combustion; that
second, the weight of the water.



			Gr.			Gr.	
1 gr. of	*Carbonic acid*	=	0·27273	of *Carbon*	+	0·72727	of *Oxygen*.
1 „	*Water*	=	9·11112	„ *Hydrogen*	+	0·88888	„
2	. . less . . .		0·38385	. . equal to		1·61615	„

The numbers equivalent to any given number of grains, found as above, are converted into the proportions per cent. by simply dividing them by the weight of the organic substance which has been employed in the experiment, and moving the decimal point of the result two figures to the right.

b. In applying the preceding method to volatile liquids, it is necessary to enclose them in a small bulb with a narrow neck, instead of mixing them directly with the protoxide of copper. The bulb with its contents is introduced into the combustion tube, and after some 6 or 8 inches of the protoxide is heated to redness, a hot coal is applied near where the bulb is situated, so that the liquid which it contains may be slowly volatilised and passed through the heated mass in the state of vapour, and be thus completely burned.

2. *Estimation* of the NITROGEN.—*a.* Several methods are employed for this purpose, but the only one of general application, and adapted to the non-scientific operator, is that of MM. Varrentrap and Will, described under GUANO. To ensure correct results, the caustic soda must be pure, and the lime of good quality and well burnt. The last, having been properly slaked with a little water holding the former in solution, the mixture is thoroughly dried in an iron vessel, and then heated to full redness in an earthen crucible. The ignited mass is rubbed to powder in a warm dry mortar, and either used at once or carefully preserved from the air. The best quantity of the organic substance to operate on is, in this case, about 10 grs., which must be dried, and accurately weighed with the usual precautions. Bodies very rich in either nitrogen or hydrogen are best mixed with about an equal weight of pure sugar before triturating them with the soda-lime. MM. Varrentrap and Will weigh the nitrogen under the form of double chloride of
platinum and ammonium, dried at 212
This salt contains 6·272% of nitrogen.

b. M. Péligot has modified the pr
plan by conducting the gaseous matte
cated during the operation into a thr
tube charged with a standard solution
phuric acid. This he subsequently pou
a beaker-glass, and after tinging it with
drop of tincture of litmus, he tests i
either a standard aqueous solution of
one of lime in sweetened water, after th
mon method of alkalimetry. The dif
between the saturating power of the
its normal condition and after its expo
the condenser indicates the amount of am
formed. (See GUANO.) Each grain of am
contains ·82353 gr. of nitrogen.

Concluding remarks. The successful
cation of the above processes requires co
rable care and some aptitude in manipul
as well as the employment of a very d
balance for determining the weight
greater error in the weighings than the
cannot be tolerated when exact results
sired. The method of MM. Varrentra
Will for the determination of nitrogen an
admirably for all organic compounds co
ing it, except those in which it exists und
form of hyponitrous, nitrous, and nitric
for which, however, it is not required.
extreme accuracy is aimed at, the atmos
air in the apparatus, and that absorbed d
the preliminary operations by the subs
employed, must be expelled before the
cation of heat to the combustion tube.

OR-MOLU′. [Fr.] This name is giv
gold-coloured brass or bronze, so finished
to have the appearance of gold, or of
gilt; but it is often applied in a more ge
sense. The French more particularly
in working in or-molu, and the produc
this branch of their industry hold

portant position in the art manufactures of France.

To give ormolu its richest appearance, "it is not unfrequently brightened up after 'dipping' (that is cleaning in acid) by means of a scratch-brush (a brush made of very fine brass wire), the action of which helps to produce a very brilliant gold-like surface. It is protected from tarnish by the application of lacquer." (Ure.)

ORMSKIRK MEDICINE. A nostrum supposed to prevent hydrophobia, so named after the residence of its inventor, Mr. Hill, of Ormskirk. It is said to have consisted of the ingredients named below, but nothing certain is known on the subject, as the inventor died without revealing its secret:—Chalk, ½ oz.; Armenian bole, 3 drs.; elecampane root, 1 dr.; alum, 10 grs.; oil of aniseed, 5 or 6 drops; all in fine powder. For a dose, to be taken for 6 successive mornings, in a glass of weak milk-and-water.

OR'PIMENT. Native yellow sulphide of arsenic. The finest samples used by artists (golden orpiment) come from Persia. See Arsenic (Tersulphuret).

OR'RIS. *Syn.* Orris root, Florentine r.; Radix iridis, L. The dried rhizome of *Iris Florentina, pallida,* and *Germanica.* Sialogogue, irritant, subacrid, and errhine. Chiefly employed to impart a violet odour to oils, tooth powder, snuffs, spirits, &c.; and when cut into peas, to keep open issues.

ORSE'DEW. Dutch leaf-gold.

ORSEL'LIC ACID. Two compounds pass under this name—alpha-orsellic acid and beta-orsellic acid. They closely resemble each other, and are obtained in a similar manner; the first from the South American variety of *Rocella tinctoria,* the last from that grown at the Cape.

ORSELLIN'IC ACID. *Syn.* Lecanoric acid. A compound formed along with picroerythrine, by boiling erythric acid for some time with water. It is also formed by boiling alpha-orsellic acid with water. In both cases, if the ebullition is too long continued, the new acid is wholly or in part converted into orcin.

Prop., &c. Crystallisable; bitter-tasted; soluble in water; its aqueous solution, by exposure to the air, assumes a beautiful purple colour.

ORTHOPÆ'DIA. In surgery, the straightening, correcting, or curing deformities of children. See Surgery.

OS'MAZOME. The substance on which the peculiar odour and flavour of boiled meat and broth were formerly supposed to depend.

Prep. From lean meat, minced, and digested in cold water, with occasional pressure; the filtered infusion is gently evaporated nearly to dryness, and then treated with alcohol; the alcoholic tincture is, lastly, evaporated. The product has a brownish-yellow colour, is soluble in water, and its aqueous solution is precipitated by infusion of galls and the mineral astringent salts.

OS'MIUM. Os. A rare metal found associated with the ores of platinum by M. Tennant, in 1803.

OSTEOCOL'LA. A rough sort of glue or gelatin obtained from bones by digestion in dilute hydrochloric acid, to remove their earthy matter, and afterwards acting on the residuum with water at a high temperature, until it is wholly dissolved.

OTAL'GIA. Pain in the ear. See Earache.

O'THYL. In chemistry, a radicle having the formula C_2H_3O, assumed by Professor Williamson to exist in acetic acid.

OT'TO OF ROSES. See Oils (Volatile).

OVALBU'MEN. White of egg; to distinguish it from seralbumen, or the albumen of the serum of the blood.

O'VENS. A very ingenious and useful improvement in the apparatus for baking was introduced some years ago by Mr. Sclater, of Carlisle. It consists in causing the articles to be baked to traverse a heated earthenware tube. This tube forms the oven. It is of considerable length, and the biscuits or other articles are slowly traversed through it, from end to end, at such a rate as will allow of the baking being completed during the passage. The biscuits are carried on trays, set on travelling chains; or the trays are made into an endless web or chain. The oven is thus entirely self-acting, and the articles demand no attention whatever from the attendants, whilst the system combines superior economy with the best results. A 'pyrometer,' or heat indicator, is attached externally, so that the attendant can regulate the heat with great facility. The object of these improvements is to reduce the cost of baking, and to improve the appearance of the baked articles. The apparatus is applicable as well to the baking of articles of clay or earthenware as to bread or biscuits.

Of the ovens now in common use by the bakers, that known as the 'hot-water oven' is perhaps the best; not merely in reference to economy, but also with reference to its superior cleanliness, and the ease with which the articles operated on may be turned out of that delicate yellowish-brown tint for which the bread of the Viennese and Parisian bakers is so celebrated. See Baking, Bread, &c.

OX. The *Bos Taurus* (Linn.), one of the ruminantia. In its more limited sense, the word is restricted to the emasculated animal. The flesh, milk, skin, horns, bones, and blood of this animal are all serviceable to man. Gold-beater's skin is prepared from the peritoneal membrane of its cæcum. Its blood, fat, horns, and excrement were among the simples of the Ph. L. 1618. See Beef, Gall, Milk, and *below.*

Ox-Gall. *Syn.* Ox-bile; Fel bovinum, F. bovis, F. tauri, L. Crude ox-gall is noticed at page 552. Refined ox-gall

(*Fel bovinum purificatum*) is prepared as under:—

1. Fresh ox-gall is allowed to repose for 12 or 15 hours, after which the clear portion is decanted, and evaporated to the consistence of a thick syrup by the heat of a water bath; it is then spread thinly on a dish, and exposed in a warm situation near the fire, or to a current of dry air, until nearly dry; it is, lastly, put into wide-mouthed bottles or pots, and carefully tied over with bladder. In this state it will keep for years in a cool situation. For use, a little is dissolved in water.

2. Fresh gall, 1 pint; boil, skim, add powdered alum, 1 oz.; boil again till the alum is dissolved, and when sufficiently cool, pour it into a bottle, and loosely cork it down. In a similar manner boil and skim another pint of gall, add to it 1 oz. of common salt, and again boil, cool, and bottle it, as above. In three months decant the clear from both bottles, and mix them in equal quantities; the clear portion must then be separated from the coagulum by subsidence or filtration.

Uses, &c. Both the above are employed by artists to fix chalk and pencil drawings before tinting them, and to remove the greasiness from ivory, tracing paper, &c. The first is also used in medicine.

OX'ALATE. *Syn.* OXALAS, L. A salt of oxalic acid. The soluble oxalates are easily formed by directly neutralising a solution of oxalic acid with a metallic hydrate, carbonate, or oxide; and the insoluble oxalates, by double decomposition. See OXALIC ACID and the respective bases.

OXAL'IC ACID. $H_2C_2O_4$. *Syn.* ACIDUM OXALICUM, L. This substance was discovered by Bergman, in 1776. It occurs both in the mineral and organic kingdoms, and is produced artificially by the action of nitric acid on sugar, starch, woody fibre, &c. It abounds in wood-sorrel, in which it exists in combination with a little potassa. With the exception of gum and sugar of milk, all starchy and saccharine substances yield oxalic acid when treated with nitric acid at a somewhat elevated temperature.

Prep. 1. From sugar:—

a. Nitric acid (sp. gr. 1·42), 5 parts, diluted with water, 10 parts, is poured on sugar, 1 part, and the mixture is digested at a gentle heat, as long as gaseous products are evolved; the liquid is then concentrated by evaporation until it deposits crystals on cooling; the crystals, after being drained and freed from superfluous moisture, are redissolved in the smallest possible quantity of boiling water, and the solution is set aside to crystallise. The residuary 'mother-water' is treated with a little fresh nitric acid (say 1¼ part) at a gentle heat, after which it is evaporated, as before, for a second crop of crystals. This process is repeated until the solution is exhausted. The brownish-coloured crystals thus obtained are allowed to effloresce by exposure to dry air, and are then redissolved and recrystallised. By repeating this treatment they yield pure colourless oxalic acid at the third crystallisation.

b. (Schlesinger.) Sugar (dried at 212° Fahr.), 4 parts, and nitric acid (sp. gr. 1·38), 33 parts, are digested together, as before, and as soon as the evolution of gas ceases the liquid is boiled down to one sixth of its original volume, and set aside to crystallise. The whole process may be completed in about 3 hours, and in 1 vessel, and yields of beautifully crystallised oxalic acid, at the first crystallisation, a quantity equal to 56 to 60% of the weight of the sugar employed.

c. (Ure.) Nitric acid (sp. gr. 1·4), 4 parts and sugar, 1 part, are digested together by the heat of a water bath, and as soon as gas ceases to be extricated the vessel is removed from the heat, and set aside to cool and crystallise. The use of a little sulphuric acid along with the nitric acid contributes to increase the product.

2. From POTATO- or DEXTRIN-SUGAR:—(Nyren.) From the washed pulp of potatoes boiled for some hours with water, q. s., in a leaden vessel, with about 2% of oil of vitriol, until the fecula of the pulp is converted into saccharine matter, shown by the liquid being no longer turned blue by iodine; the whole is then filtered through horse-hair bags or strainers, and the filtrate is evaporated until its density is such that a gallon of it weighs 14 to 14½ lbs.; in this state it is converted into oxalic acid by treatment with nitric acid in the way already described. A similar process was patented some years ago by Messrs. Davy, Macmurdo, and Co.

3. From SAWDUST:—

(Roberts, Dale, & Co., Patent.) This process is the one now usually employed for the manufacture of oxalic acid on the large scale. It is based on Gay-Lussac's discovery, that wood and similar substances are converted into oxalic acid by fusion with caustic alkali. The practical details of the process are thus given by Dr. Murray Thomson, of Edinburgh:—(1) Hydrate of sodium and hydrate of potassium, mixed in the proportion of 2 equivalents of the former to 1 equivalent of the latter, are dissolved, and solution evaporated until of specific gravity 1·35; sawdust is now stirred in until a thick paste results. (2) This paste is then heated on iron plates, during which it is constantly stirred; water is first given off; the mass then swells; inflammable gases, hydrogen and carburetted hydrogen, are evolved, along with a peculiar aromatic odour. When the temperature has been maintained at 400° for one or two hours, this stage of the process is complete; the mass has now a dark colour, and contains only 1 to 4 per cent. of oxalic acid, and about ·5 per cent. of formic acid. The bulk, therefore, of the mass at this stage consists of a substance whose nature is not yet known, but which is intermediate between the cellulose and oxalic acid. (3) The next stage consists in a simple extension of the last, in which the mass is heated till quite dry, care being taken that no charring takes place. It now contains the maximum quantity of oxalic acid, 28 to 30 per cent. (4) This oxalic acid now exists as oxalate of potassium and sodium in the gray powder resulting from stage 3. This powder is now washed on a filter with solution of carbonate of sodium, which seems to have the singular and unexpected power of decomposing the oxalate of potassium, and converting it into oxalate of sodium. At all events, it is quite true that all traces of potassa are washed out with the solution of carbonate of sodium. The only explanation that occurs to account for this unusual decomposition is that oxalate of sodium is a more insoluble salt than oxalate of potassium, and therefore may be formed by preference. (5) This oxalate of sodium is now decomposed by boiling milk of lime. Oxalate of calcium falls as a precipitate, and soda remains in solution. This soda is boiled down, and again made use of with fresh sawdust. This recovery of alkali is also practised with the potassium salt which filters through in the last stage. (6) The oxalate of calcium is now decomposed in leaden vessels with sulphuric acid. Sulphate of calcium is precipitated, and oxalic acid is in solution, which is now evaporated, and the acid separates in crystals, which now need only to be recrystallised to make them quite pure, and fit the acid for all the purposes for which it is employed. *Prod.* By this ingenious process 2 lbs. of sawdust are made to yield 1 lb. of oxalic acid.

Prop., *&c.* Colourless, transparent, prismatic crystals, possessing a powerfully sour taste and acid reaction; these effloresce in warm dry air, with loss of 28% (2 eq.) of water, and then form a white powder, which may be sublimed in part, without decomposition; the crystals are soluble in 8 parts of water (9 parts, "and form a solution of sp. gr. 1·045," —Ure) at 60° Fahr., in their own weight or less of boiling water, and in about 4 parts of alcohol; with the acids, it forms salts called oxalates.

Tests.—1. Solution of chloride of barium occasions a white precipitate in neutral solutions of oxalic acid (oxalates), which is soluble in both nitric and hydrochloric acid.—2. Solution of nitrate of silver, under like circumstances, gives a white precipitate, which is soluble in nitric acid and in ammonia, and which, when heated to redness, yields pure silver.—3. Lime water and solutions of all the soluble salts of calcium produce white precipitates, even in highly dilute solutions of oxalic acid or of the oxalates, which is freely soluble in both nitric and hydrochloric acid, but is nearly insoluble in either acetic or oxalic acid, and is converted into carbonate of calcium upon ignition.—4. Oxalic acid (or an oxalate), when heated, in the dry state, with oil of vitriol in excess, is converted into carbonic anhydride and carbonic oxide; the former produces a white precipitate with lime water, and the latter, when kindled, burns with a faint blue flame. Of the above tests, solution of sulphate of calcium (*vide* No. 3) is the most delicate and characteristic.—5. It is distinguished from Epsom salt by its acid reaction, its solubility in rectified spirit, its complete dissipation by heat, and by emitting a slight crackling noise during its solution in water. See MAGNESIA (Sulphate).

Uses, *Pois.*, *&c.* Oxalic acid is chiefly used in the arts of calico printing and bleaching; to remove ink-spots and iron-moulds from linen, and to clean boot-tops. It is extremely poisonous. The treatment, in cases of its having been swallowed, is to promote vomiting, and to administer chalk, whiting, or magnesia, mixed up with water, in considerable quantities. The use of the alkalies or their carbonates must be avoided, as the compounds which these form with oxalic acid are nearly as poisonous as the acid itself. The remaining treatment is noticed under ACIDS. In poisoning by oxalic acid, the nervous system is almost always affected, and the patients experience numbness, formication of the extremities, and sometimes convulsions, so that the symptoms somewhat approach those produced by strychnia, from which it is distinguished by its corrosive action on the tissues, and its effect upon the heart and circulatory system.

Concluding remarks. The manufacture of oxalic acid is an important one. The process of Roberts, Dale, and Co., has so much cheapened the price of oxalic acid, that in 1851 it sold for 16d. per lb., and now, in 1864, it only costs from 8d. to 9d. per lb. More than half the amount of oxalic acid used all over the world is now made from sawdust. In manufacturing the acid from sugar, on the large scale, the first part of the process is either conducted in salt-glazed stoneware pipkins of the capacity of 3 to 5 quarts each (which are about two thirds filled and set in a water bath), or in wooden troughs lined with lead, and heated by means of a coil of steam-pipe. On the small scale, a glass retort or capsule is commonly employed. The most appropriate temperature appears to be about 125° Fahr. and the best evidence of the satisfactory progress of the decomposition is the free but not violent evolution of gas, without the appearance of dense red fumes, or, at all events, any marked quantity of them. When these are disengaged with violence and rapidity, a greater quantity of the newly formed acid suffers decomposition, and flies off in a gaseous form. The sp. gr. of the nitric acid commonly used on the large scale ranges from 1·22 to 1·27, equivalent quantities being taken. The evaporation is preferably conducted by the heat of steam. The evolved nitrous vapours are usually allowed to escape, but this loss may be in part avoided by conveying them into a chamber filled with cold damp air, and containing a little water, when they will absorb oxygen, and be recondensed into fuming nitric acid. Various modifications of this plan have been patented. That of Messrs. McDougall and Rawson, which is one of the simplest and best, consists in passing the mixed nitrous fumes through a series of vessels containing water, and connected together by tubes, so that the fumes which collect at the top of one vessel are conveyed to nearly the bottom of the next one, and then, bubbling up through the water, mix with the air, a supply of which is provided for the purpose. The nitrous fumes are thus brought alternately into contact with air and water, and by the time they reach the last vessel are reconverted into nitric acid. Another plan is to pass the mixed nitrous vapours through a vessel stuffed with some porous substance, as pumice-stone or pounded glass, conjointly with a supply of steam from a boiler and a supply of oxygen by a blowing machine.

The products obtained by skilful manipulation are—from good dry sugar, 128%; from good treacle, 107%.—"One cwt. of good treacle will yield about 116 lbs. of marketable oxalic acid, and the same weight of good brown sugar may be calculated to produce about 140 lbs. of acid." "As a general rule, 5 cwt. of saltpetre, or an equivalent of nitrate of soda, with 2½ cwt. of sulphuric acid, will generate sufficient nitric acid to decompose 1 cwt. of good sugar, and yield, as above, 140 lbs. of fair marketable oxalic acid, free from superfluous moisture." (Ure.) On the small scale, 5 parts of sugar yield nearly 6 parts of crystallised acid.

Chemically pure oxalic acid is best prepared by precipitating a solution of binoxalate of potassium with a solution of acetate of lead, washing the precipitate with water, decomposing it, whilst still moist, with dilute sulphuric acid or sulphuretted hydrogen, and gently evaporating the filtrate so that crystals may form as it cools.

OXIDA'TION. *Syn.* OXYDATION. The combination of bodies with oxygen, forming oxides; the operation or process adopted to induce or facilitate such conversion.

OX'IDE. *Syn.* OXYD; OXYDUM, L. A compound formed by the union of oxygen with another body.

OXYCHLO''RIDE. *Syn.* OXICHLORIDE; OXYCHLORIDUM, L. A term often loosely applied to compounds of an oxide and chloride, whether in definite or variable proportions. See ANTIMONY (Oxychloride), &c.

OX'YCRATE. *Syn.* OXYCRATUM, L. The old name of a mixture of vinegar and water, dulcified with honey.

OXYCRO'CEUM. See PLASTERS.

OX'YGEN. O. *Syn.* OXYGEN GAS, DEPHLOGISTICATED AIR†, EMPYREAL A., VITAL A.†; OXYGENIUM, L. An elementary body discovered by Scheele and Priestley in 1744. It is remarkable that, although this substance forms a large proportion of our atmosphere (nearly one fourth), and confers upon it the power of supporting respiration and combustion, and also constitutes the principal portion of the water of our rivers and seas (eight ninths), and enters largely into the composition of the majority of the various mineral bodies that form the bulk of our globe, its existence should have remained unsuspected, or at least undetermined, until a comparatively recent date. Oxygen is an essential constituent of all living organisms. It is absorbed by animals during respiration, and evolved in a free state by growing vegetables when exposed to sunlight. The oxygen gas of the atmosphere is mechanically mixed, not chemically combined, with the nitrogen.

Prep. 1. From red oxide of mercury, heated over a spirit lamp or a few pieces of ignited charcoal. The operation is usually performed in a small green-glass retort, or in a short tube of hard Bohemian glass, closed with a perforated cork furnished with a piece of bent glass tube of small bore, to convey the liberated gas to the vessel arranged to receive it. Pure. 1 oz. yields about 100 cubic inches.

2. From chlorate of potassium, as the last. Pure. 100 grs. yield nearly 100 cubic inches (Brande; 115—Ure). This is the plan adopted in the P. Cod. The decomposition occurs with both the above substances at a heat below that of redness.

3. From a mixture of chlorate of potassium (in coarse powder), 3 parts; powdered binoxide of manganese, 1 part; both by volume. Pure. 100 grs. of the mixture yield about 110 cubic inches of oxygen. This method, which has received the approval of Faraday, is exceedingly convenient. The gas is evolved with a rapidity which is entirely at the command of the operator, by simply increasing or lessening the heat. The residuum in the retort may be kept for another operation, if not exhausted; or it may be at once washed out with a little warm water, and the manganese, which is uninjured by the process, reserved for future use. Red lead, black oxide of copper, red oxide of iron, and several other substances, answer nearly as well as binoxide of manganese.

4. From a mixture of bichromate of potassium, 3 parts; oil of vitriol, 4 parts; gently heated, as before. Yields pure oxygen very freely, and with a rapidity entirely at the will of the operator. (Balmain.)

5. From binoxide of manganese and oil of vitriol, equal parts; as the last. 44 grs. of pure binoxide of manganese yield 8 grs., or 24 cubic inches, of oxygen; 1 oz. yields 88 grs., or 256 cubic inches. (Liebig.)

6. (On the large scale.)—*a.* From nitre exposed to a dull red heat in an iron retort or gun-barrel. 1 lb. yields about 1200 cubic inches of gas, contaminated, more or less, with nitrogen. (Ure.)

b. From binoxide of manganese, as the last. 1 oz. of the pure binoxide yields 44 grs., or 128 cubic inches, of oxygen (Liebig); 1 lb. of good commercial binoxide yields from 1500 to 1600 cubic inches, or from 5 to 6 galls.

c. M. Boussingault has reinvestigated a process, long known, although not usefully applied, by which pure oxygen gas may be obtained from the atmosphere at a trifling cost, so as to enable it to be collected in unlimited quantities and preserved in gasometers, like coal-gas, for application in the arts, manufactures, and sanitation. This process depends upon a peculiar property possessed by the earth baryta, of absorbing atmospheric oxygen at one temperature and evolving it at another; or rather, the ready conversion of hydrate of barium into peroxide of barium by a current of atmospheric air at a dull red heat, and the decomposition of this peroxide, by steam, at a lower temperature, even at 212° Fahr., with reproduction of hydrate of barium, the process being in reality a continuous one. The baryta is mixed with a portion of hydrate of calcium or of magnesium, and the mixture being placed in an appropriate earthen tube heated to dull redness, is oxidised by passing a current of dry atmospheric air over it. As soon as the oxidation is complete, the tube is connected with the gas-holder, and a jet of steam allowed to act upon it; this reconverts the peroxide of barium into hydrate of barium, the excess of oxygen being given off and collected in the gas-holder. The baryta is then again oxidised by a fresh current of air and deoxidised by steam, and the whole process is repeated as frequently as required. One ton of baryta, thus treated, is capable of yielding 2500 cubic feet of pure oxygen every 24 hours; and this, as it does not waste or lose its properties, at the mere cost of the fuel and labour required in the process.

d. From ferrate of potassium, prepared on the large scale. When exposed to moisture or thrown into water, pure oxygen is evolved. This method has been successfully adopted to maintain the air of diving-bells, and of other confined spaces, in a state fit for respiration.

7. OXYGEN GAS AT THE ORDINARY TEMPERATURE. Boettger states that when a mixture is made of equal weights of the peroxides of lead and barium, and dilute HNO_3 of a strength of 9° Beaumé is poured thereon, a current of pure O, free from ozone and antozone, is given off abundantly. This mixture of the two peroxides may be kept dry in a stoppered bottle for any length of time.

Prop. Oxygen gas is colourless, tasteless, inodorous, and incombustible; the sp. gr. is 1·057 (Dumas; 1·1026—Berzelius & Dulong; 1·111—Thomson); 100 cubic inches at 60° Fahr., and 36 inches of the barometer, weigh 34·29 grs. (Dumas; *34·109 grs.*—Berz.; 34·6 *grs.—Brande; 33·85 grs.—Ure).* Its density to that of atmospheric air is, therefore, as about 11 to 10. It is a powerful supporter of combustion, and its presence is essential to the existence of both animal and vegetable life. It forms $21\frac{0}{0}$ ($20·81\frac{0}{0}$) by volume, and $23\frac{0}{0}$ by weight, of the atmosphere. (M. Dumas.) Water dissolves about $5\frac{0}{0}$ by volume of oxygen, and by pressure a much larger quantity, forming oxygenated water (AQUA OXYGENII).

Tests. 1. It is distinguished from other gases by yielding nothing but pure water when mixed with twice its volume of hydrogen and exploded, or when a jet of hydrogen is burnt in it.—2. A recently extinguished taper, with the wick still red-hot, instantly inflames when plunged into this gas.—3. A small spiral piece of iron wire ignited at the point, and suddenly plunged into a jar of oxygen, burns with great brilliancy and rapidity. Charcoal does the same.

Estim. The estimation of the quantity of oxygen in an organic compound has already been described. For determining the quantity present in atmospheric air, and other like gaseous mixtures, Dobereiner has proposed the use of pyrogallic acid. The air under examination (freed from moisture) is measured into an accurately graduated tube over mercury, capable of holding about 30 cubic centimètres, and which it should $\frac{2}{3}$rds fill. A solution formed of 1 part of dry hydrate of potassium and 2 parts of water, and in volume about $\frac{1}{25}$th that of the air, is next introduced by means of a pipette with a curved point, and is gently agitated therewith in the gas for a short time; the decrease of volume gives the proportion of carbonic anhydride present. A solution of pyrogallic acid (1 gramme in 5 or 6 centimètres of water), equal in volume to one half that of the solution of potassa already used, is then introduced by means of another pipette, and the mixed liquids are cautiously shaken together over the inner surface of the tube. When absorption ceases (which it does in a few midutes), the quantity of residual gas (nitrogen) is read off from the graduations; the difference in volume before and after the introduction of the pyrogallic acid indicates the proportion of oxygen. This is a mere modification of Prof. Liebig's method. 1 gramme of pyrogallic acid in combination with hydrate of potassium is capable of absorbing about 189 cubic centimètres of oxygen. (Dobereiner.) Other methods employed for the analysis of air, depending on the increase or loss of weight when the air is passed over finely divided copper heated to redness, the loss of volume when the air is exploded in a eudiometer with half its bulk of hydrogen, or when a stick of phosphorus is left in it for some hours, are well known, and described at length in every elementary work on chemical analysis. The last method, although less accurate than the others, has the advantage of extreme simplicity.

Uses. Hitherto the trouble and expense of preparing oxygen has precluded its direct use on the large scale. It has been employed to increase the illuminative and heating power of lamps, and to render vitiated air respirable, &c.; and when largely diluted with atmospheric air, or condensed in water, as a remedial agent in asphyxia arising from the inhalation of carbonic acid and carbonic oxide.

Concluding remarks. Oxygen gas may be collected in the usual way, either over water, mercury, or in bags; or, on the large scale, in gasometers. The purity of the products of the several processes given above depends on the substances from which the gas is obtained being themselves pure. For particular experiments, the first portion of gas should be allowed to escape, or be received apart, as with this, as with the other gases, it is contaminated with the atmospheric air of the apparatus. The gas procured from manganese or nitre may be purified by passing it through milk of lime or a solution of caustic potassa; it will still, however, retain some traces of nitrogen. See ORGANIC SUBSTANCES, OZONE, &c.

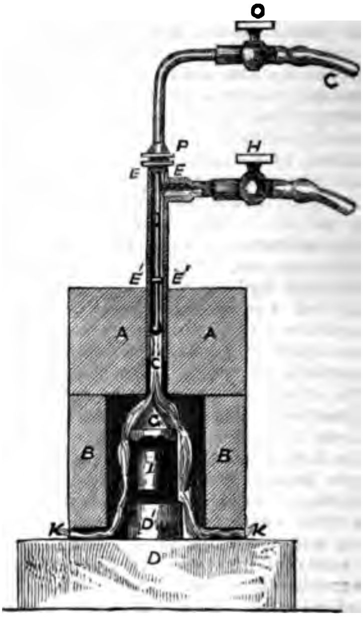
OXYGENA'TION. *Syn.* OXYGENISEMENT. The act or process of combining with oxygen. It is of more general application than the word 'oxidation,' which is frequently confounded with it, but which is only correctly applied when an oxide is formed.

OXYGENI'SED LARD. *Syn.* OXYGENATED AXUNGE; AXUNGIA OXYGENATA, L. *Prep.* (Ph. Bat. 1805.) From prepared lard, 16 parts, melted over a slow fire, and then mixed with nitric acid, 1 part; the combination being promoted by constant stirring with a glass rod, until it ceases to affect litmus paper. It should be extremely white, and should be kept in the dark. See OINTMENT OF NITRIC ACID.

OXYHYDROGEN BLOWPIPE. See BLOWPIPE. Deville and Debray ('Ann. Ch. Phys.' [3], lvi, 385) employ the oxyhydrogen blowpipe in the following manner for effecting the fusion of platinum and the refractory metals which accompany it. The apparatus consists of the blowpipe *C* (see *below*), a furnace *ABD*, and a crucible *GHI*. The blowpipe is composed of a copper tube about half an inch in diameter, terminating below in a slightly conical platinum jet about 1½ inch long. Within this tube, which is supplied with hydrogen or coal gas through the stop-cock *H*, is a second copper tube *C'* for supplying oxygen, terminated also by a platinum nozzle with an aperture of about a twelfth of an inch in diameter.

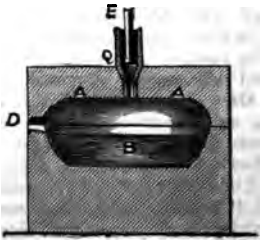
The furnace *ABD* consists of three pieces of well-burnt lime of slightly hydraulic quality, which may be turned at a lathe with ease. The cylinder *A* is about 2½ inches thick, and is perforated by a slightly conical hole into which the blowpipe fits accurately, passing about half-way through the thickness of the mass. A second somewhat deeper cylinder of lime, *B*, is hollowed into a chamber wide enough to admit the crucible, and leave an interval of not more than a sixth of an inch clear around it. *KK* are four apertures for the escape of the products of combustion.

The outer crucible *HH* is also made of lime, but it contains a smaller crucible *I* of gas-coke, provided with a cover of the same material; and in this the substance to be fused is placed, the crucible resting on the lime support *D'*. The conical cover *G* is made of lime, and its apex should be placed exactly under the blowpipe jet, at a distance from it of ⅜ to 1¼ inch.



The different pieces of the furnace must be bound round with iron wire to support them when they crack. The oxygen is admitted under a pressure of a column of 16 inches of water. The temperature is gradually raised to the maximum, and in about eight minutes from this time the operation is complete.

By employing a jet of mixed coal-gas and oxygen (*EQ*, see *below*) in a furnace of lime,



Deville and Debray succeeded, at an expense of about 43 cubic feet of oxygen, in melting and refining, in 42 minutes, 25·4 lbs. avoirdupois of platinum, and casting it into an ingot in a mould of gas-coke; and much larger masses have since been melted by this method. Lime is so bad a conductor of heat that if a cup of lime not more than 0·8 inch thick be filled with melted platinum the exterior scarcely rises beyond 300° F. (Miller's 'Elements of Chemistry,' 3rd. ed., pt. ii, p. 825.)

OX'YMEL. *Syn.* OXYMEL, L. An acidulous syrup made of honey and vinegar. There are only two oxymels in the last Ph. L. The ingredients in an oxymel should be of such a character, and in such proportions, as to produce a mixture of the proper consistence without evaporation.

Oxymel of Col'chicum. *Syn.* OXYMEL COLCHICI CORMI, OXYMEL COLCHICI, L. *Prep.* (Ph. D. 1826.) Fresh corms (roots) of meadow saffron, 1 oz.; distilled vinegar, 1 pint (wine measure); macerate for 2 days, press out the liquor, filter, add of clarified honey, 2 lbs., and boil down the mixture to the consistence of a syrup, frequently stirring.—*Dose.* 1 to 3 drs., twice or thrice a day; in gout, rheumatism, dropsy, &c.

Oxymel of Gar'lic. *Syn.* OXYMEL ALII, L. *Prep.* (Ph. L. 1746.) Sliced garlic, 1½ oz.; caraway seed and sweet fennel seed, of each, 2 drs.; boiling vinegar, 8 fl. oz.; infuse, strain, and add of clarified honey, 10 oz. In hooping-cough, chronic diarrhœa, rheumatism, &c.

Oxymel, Pec'toral. *Syn.* OXYMEL PECTORALE, O. INULÆ COMPOSITUM, L. *Prep.* (Ph. Br.) Elecampane, 1 oz.; orris root, ½ oz.; water, 1½ pint; boil to ½ pint, strain, add of honey, 16 oz.; ammoniacum, 1 oz.; (dissolved in) vinegar, 3 fl. oz.; lastly, boil to an oxymel. —*Dose.* 1 spoonful, occasionally; in coughs, humid asthma, &c.

Oxymel, Sim'ple. *Syn.* VINEGAR SYRUP, ACETATED HONEY; OXYMEL (Ph. L. & D.), OXYMEL SIMPLEX, MEL ACETATUM, L. *Prep.* 1. (Ph. L.) Acetic acid (sp. gr. 1·048), 7 fl. oz.; distilled water, 8 fl. oz.; mix, and add them to honey, 5 lbs., previously made hot. This contains only one half the acid ordered in the Ph. L. 1836.

2. (Ph. D.) Clarified honey, 1 lb.; acetic acid (sp. gr. 1·044), 3 oz.; as before. Stronger than the last.

3. Ph. L. 1836.) Honey, 10 lbs.; acetic acid (1·048), 1½ pint; as before. This contains too much vinegar. (See No. 1.)

4. (Wholesale.) From honey (thick and good), 12 lbs.; melt it by a gentle heat, add of distilled vinegar (of fully 5%), 2 quarts, and strain the mixture through flannel. No evaporation is required.

Uses, &c. Demulcent and refrigerant.—*Dose.* 1 to 4 fl. drs., either gradually sucked from the spoon or dissolved through some simple liquid. Dissolved in water, it forms a useful and pleasant cooling drink or gargle in fevers, sore throats, hoarseness, &c.; but in some individuals it occasions griping. It is commonly used as an adjunct, in mixtures, &c.

Oxymel of Squills. *Syn.* HONEY OF SQUILLS; MEL SCILLÆ (Ph. L.), O. SCILLITICUM, L. *Prep.* 1. Vinegar of squills, 2½ pints; gently evaporate it to 12 fl. oz., and add of honey (previously made hot), 5 lbs.

2. (Ph. L. 1836.) Strained honey, 3 lbs.; vinegar of squills, 1½ pint; boil to a proper consistence. The formula of the Ph. D. 1826 was similar.

Uses, &c. Expectorant, and in large doses nauseant.—*Dose.* ½ to 2 fl. drs.; in chronic coughs, hoarseness, humeral asthma, &c.

Oxymel of Ver'digris. See LINIMENT.

OXYR'RHODYNE. *Syn.* OXYRRHODINON. An old compound formed of 1 part of vinegar of roses and 2 parts of oil of roses.

OXYSAC'CHARUM. A syrup acidulated with vinegar. See SYRUP.

OXYSUL'PHIDE. A name given to certain compounds or mixtures of metallic oxides and sulphides. See ANTIMONY, OXYSULPHIDE, &c.

OYS'TER. *Syn.* OSTREA, L. This well-known shell-fish is the *Ostrea edulis* (Linn.)

Oysters are nutritious and easy of digestion, when fresh, but are apt to prove laxative to those unaccustomed to their use. They are in season each month of the year the name of which contains the letter R. The best British oysters are found at Purfleet; the worst near Liverpool. Colchester, and other places in Essex, are the great nurseries or feeding-grounds for supplying the metropolis, and, indeed, the whole of England, with the most esteemed variety (NATIVES) of this shell-fish. The shells (TESTÆ PREPARATÆ, T. OSTREARIÆ) were formerly used in medicine as an absorbent. See SHELL-FISH, SAUCES, &c.

OZONE (Greek, ὄζω, I smell) is a peculiar variety of oxygen, characterised by its greater weight, its peculiar chlorous smell, its intensely active oxidising powers, and, finally, by the ease with which it passes into common oxygen. The history of ozone may be summed up as follows:—In 1785 Van Marum observed the production of a peculiar smell when electric sparks were passed through oxygen. This smell, which every one who has worked with an electric machine must have noticed, Van Marum regarded as the "smell of electricity," thinking that electricity was a substance. In 1840, Schönbein, of Basle, proved the existence of a definite substance, to which he assigned the name of ozone, and discovered several modes of producing it, a delicate test for it, and several of its most striking properties. He subsequently added many new facts, but to the time of his death never held a correct theory in regard to its nature. Later researches by Marignac and Dedalline, Becquerel and Fremy, Andrews and Tait, Soret, Brodie, and others, have established the true nature of this remarkable body. It is now generally admitted that it only differs from common oxygen in containing three atoms of oxygen in each molecule instead of two. In fact, as the formula for oxygen is O_2, that of ozône is O_3. It follows that ozone is half as heavy again as oxygen, and it has accordingly been demonstrated that its specific gravity is 24 (H = 1), that of oxygen being 16. All the known reactions of ozone are easily explained in accordance with this view.

Ozone may be generated in several ways. (1) By the action of electricity on oxygen or air, sparks are far less efficacious than the silent or "slow" discharge; but the best apparatus is the induction-tube of Siemens. This consists of two tubes, one inside the other. The inner side of the inner and the outer side of the outer tube are coated with tinfoil, and these coatings are connected with the terminals of a powerful induction-coil. Dry air or oxygen streams between the tubes and passes out, strongly charged with ozone. (2) During certain processes of oxidation a piece of phosphorus, half covered with water in a bottle of air, absorbs a portion of the oxygen, while another portion becomes partially ozonised. It has been recently shown that ozone is formed in small quantity during the burning of hydrogen at a jet, and in several analogous reactions. (3) During the liberation of oxygen at low temperatures, when barium dioxide is moistened with sulphuric acid, the odour of ozone is at once apparent, and the evolution proceeds for a considerable time. (4) In the electrolysis of water the oxygen evolved consists partly of ozone, especially if the poles are small.

Ozone has never been isolated. By the use of Siemens' apparatus, oxygen containing, as a maximum, twenty volumes per cent. of ozone may be obtained. This represents a contraction of about 1-11th during formation. But it is at present impossible to separate the one from the other. Ozone is entirely converted into oxygen by a temperature of 270° C. The conversion is effected more slowly at lower temperatures. Silver, mercury, iodine, and many other substances, are oxidised immediately, at ordinary temperatures, by ozone. One of the most delicate tests for it is potassium iodide, either alone or mixed with starch. A brown colour in the former case, a blue in the latter, indicates the liberation of iodine. In the best form of *ozonometer* strips of paper saturated with starch and potassium iodide are exposed to the action of a definite volume of air in a dark chamber. The comparative quantities of ozone in different samples of air are judged of by the intensity of the colour compared with a fixed scale on which 1 is the lightest and 10 generally the darkest shade.

Ozone acts as a *reducing* agent in certain curious cases. Thus, hydrogen peroxide and ozone reduce one another, water and oxygen being the sole products; and some substances, such as platinum black and manganese peroxide, convert it into oxygen without suffering change themselves, being probably oxidised and reduced alternately. Ozone is a powerful bleaching and disinfecting agent, from the ease with which it gives up its third atom of oxygen.

Ozone is frequently present in the atmosphere, formed by atmospheric electricity, and perhaps by other means. Its function in nature is not yet well known; but as it readily converts ammonia into ammonium nitrite, it is probable that nitrites, and so ultimately nitrates, are among its ultimate products.

OZONOM'ETER. This name has been given to paper prepared with a mixed solution of starch and iodide of potassium. It is white, but is turned blue by ozonised air, when exposed to it in a slightly moistened state.

PACK'FONG. *Syn.* PAKFONG, CHINESE WHITE COPPER. An alloy formed by fusing together, in a covered crucible, arsenic, 2 parts, and copper clippings, 4½ to 5 parts, arranged in alternate layers, and covered with a capping of common salt. The product contains about 10% of arsenic.

Prop., *&c.* White, slightly ductile, and permanent at ordinary temperatures; at a temperature below that of redness it suffers decomposition, with the extrication of fumes of arsenious acid. Formerly much used for the scales of thermometers and other instruments, dial plates, candlesticks, &c. It is now almost superseded by the alloy of nickel and copper called German silver, to which the name is also applied by some recent writers.

PACK'ING. As there is considerable art in packing brittle, hollow-ware, as glass, china, &c., in such a way that it will stand exposure to the jolting, blows, and agitation of land carriage, it is better, when it is of much value, or in quantity, to employ a person qualified for the job. A man, accustomed to packing such articles, may be readily procured at any glass-works, or china warehouse, for a trifling consideration. When this cannot be done, it must be recollected that the great secret of safe packing consists in the articles being carefully preserved from undue pressure or contact with each other, yet so firmly arranged, and so surrounded with some material, as hay, straw, sawdust, &c., that they cannot be shaken into such a condition by the ordinary contingencies of transport. Loose packing must always be avoided.

PAD'DING. Amongst calico printers this term is applied to the operation of impregnating the pores of their cloth with a mordant. It is now almost exclusively performed by means of a simple piece of machinery (padding machine), which essentially consists of—a 'large reel,' around which the unprepared cloth is wound—a 'guide roller,' over which it passes to smooth and adjust it before entering the liquor—a copper cylinder, or 'dip-roller,' nearly at the bottom of the 'mordant-trough, under which it is carried from the guide-roller—a half-round polished 'stretched-bar,' to give it equal tension—a pair of 'padded cylinders,' to remove superfluous moisture—and, lastly, a 'reel' to receive the mordanted ('padded') cloth. The degree of tension is regulated by a weight suspended on a lever, and motion is given to the whole by an endless band from the driving shaft. This machine is also applicable to many of the operations of dyeing, bleaching, and starching textile fabrics.

PAINT'ER'S CREAM. *Prep.* Take of pale nut oil, 6 oz.; mastic, 1 oz.; dissolve, add of sugar of lead, ¼ oz., previously ground in the least possible quantity of oil; then further add of water, q. s., gradually, until it acquires the consistence of cream, working it well all the time. *Used* by painters to cover their work when they are obliged to leave it for some time. It may be washed off with a sponge and water.

PAINT'ING. The art or employment of laying on colour. In the fine arts, the production of a picture or a resemblance in colours on a flat surface. The artistic and mechanical consideration of this subject does not come within the province of our volume; but notices of the leading materials employed by both artists and house painters are given under the respective names. See the various pigments, COLOURS, OILS, VARNISHES, &c., and *below*.

Painting, Distem'per. A method of painting generally adopted by the ancients. Water was the principal medium, but various gelatinous and albuminous 'binders' were added to fix the pigments. Of these the most important were glue, size, and white of egg. In modern distemper, as executed by the painters of theatrical scenery, panoramas, &c., spirit of turpentine is largely employed as a medium.

Painting, Elydor'ic. A method of painting invented by M. Vincent, of Montpelier, having for its object to combine the fresh appearance and finish of water colours with the mellowness of oil painting. The liquid employed as a vehicle for the pigments is an emulsion formed of oil and water by the intervention of certain portion of gum or mucilage.

Painting, Enam'el. In this variety of painting, vitrifiable colours are laid on thin plates of metal, and fused into it. The outline is first burnt in, after which the parts are filled up gradually, with repeated fusions at an enameller's lamp, to the most minute finishing touches. "The enamel painter has to work, not with actual colours, but with mixtures which he only knows from experience will produce certain colours after the operation of the fire." (Aikin.)

Painting, Encaus'tic. This method is very ancient, but is now seldom practised. According to Pliny, the colours were made up into crayons with wax, and the subject being traced on the ground with a metal point, they were melted on the picture as they were used. A coating of melted wax was then evenly spread over all, and when it had become quite cold was finally polished.

The art of encaustic painting, after lying dormant for about 15 centuries, was revived by Count Caylus, in 1753. In its new form, the wood or canvas to be painted on is first well rubbed over with wax, and then held before the fire, so that the wax may penetrate and fill up all the interstices, and form a perfectly even surface. The coloured pigments are next mixed with the powder noticed below, which is then rubbed smooth with some thick gum water, and applied with brushes in the same manner as ordinary water colours. When the painting is finished, and quite dry, it is brushed over with pure white wax in a melted state, the surface being equalised by the skilful application of heat; it is, lastly, polished off, as before.

The powder.—To white wax, melted in an earthen pipkin, add, in small portions at a time, an equal weight of powdered mastic, stirring continuously until the whole is incorporated; then pour it into cold water, and afterwards reduce it to powder in a wedgwood-ware mortar. A small quantity only of this powder is used with light colours; but more is required with the darker ones, until, on approaching black, the two may be mixed in almost equal proportions.

Painting, Fres'co. This method of painting was known to the ancient Egyptians, and was commonly practised by the Greeks and Romans. It is confined to the decoration of the walls of buildings, and is executed by incorporating the colours with the still moist plaster, or gesso. The pigments employed are entirely mineral or vitreous. As it is extremely difficult to alter the work after the colours are once absorbed, or after the ground has hardened, the whole must be carefully designed before commencing the picture, and no more commenced at once than can be executed during the day.

Of all the varieties of painting, fresco is "undoubtedly the most virile, most sure, most resolute, and most durable" (Vasari), and the one most adapted for the purposes of historical painting in its grandest and most exalted forms. In comparison with it, it has been said that even oil painting is "employment fit only for women and children." (Michael Angelo.)

Painting, Glass. See STAINED GLASS.

Painting, Oil. This well-known and much practised method of painting takes its name from the vehicle employed for the colours. The last may be any of those of a permanent character, and whose natural tint is not altered by admixture with oil. Linseed, nut, and poppy oil, are those which are principally employed. The first requires the addition of 'driers,' and hence is generally used under the form of 'boiled oil.' Spirit of turpentine is commonly used to thin down the prepared colours, and the finished picture is frequently covered with a coat of varnish.

Painting, Por'celain. See POTTERY, STAINED GLASS, &c.

Painting, Vel'vet. Any of the ordinary non-corrosive pigments or liquid colours, thickened with a little gum, may be employed in this art; preference being, however, given to those that possess the greatest brilliancy, and which dry without spreading. See STAINS, &c.

Painting, Water-colour. In its strictest and modern sense, 'water-colour painting' means the painting on paper with colours diluted with water. The English school of water-colour painting has produced works which bear comparison with the great masterpieces in oil, and even surpass them in the delicacy of atmospheric effects. The old practice of making the entire drawing in light and shade by washes of Indian ink or neutral tints, and then adding the various local colours in transparent washes, has given place to the more healthy system of painting every object in its appropriate local colour at the outset.

PAINTINGS. Many valuable paintings suffer premature decay from the attacks of a microscopic insect, a species of acarus or mite. The best method of preventing this variety of decay, is to add a little creasote (dissolved in brandy or vinegar), or a few grains each of corrosive sublimate and sal ammoniac (dissolved in a little water), to the paste and glue used to line the picture, as well as to add a few drops of pure creasote or of an alcoholic or ethereal solution of corrosive sublimate to the varnish, when any is to be applied. If the destruction alluded to has already commenced, the painting should be at once carefully cleaned and re-lined, observing to employ one or other of the remedies just mentioned.

The most appropriate and only safe situation in which to keep paintings, is where there is a pure and moderately dry atmosphere. Impure air abounds in carbonic acid and sulphuretted hydrogen. It is the presence of the last in the air that blackens the 'lights,' and causes most of the 'middle tints' and 'shades' to fade; and it is exposure to damp that produces mouldiness and decay of the canvas. For this reason valuable paintings should not be kept in churches, nor suspended against heavy walls of masonry, especially in badly ventilated buildings. Excess of light, particularly the direct rays of the sun, also acts injuriously on paintings, since it bleaches some colours and darkens others.

The blackened lights of old pictures may be instantly restored to their original hue by touching them with peroxide of hydrogen, diluted with 6 or 8 times its weight of pure water. The part must be afterwards washed with a clean sponge and water. The most astonishing results have been produced in this way. See PEROXIDE OF HYDROGEN (page 610).

PAINTS. In trade, this term is commonly applied to pigments ground with oil to a thick paste, ready to be 'thinned down' with oil or turpentine to a consistence adapted for application with a brush.

Paints are prepared on the small scale by grinding the dry pigments with the oil by means of a stone-and-muller; on the large scale they are ground in a colour mill. There are several pigments, as King's yellow, Scheele's green, verdigris, white lead, &c., which from their poisonous character cannot be safely ground by hand, except in very small quantities at a time, and then only by the exercise of extreme caution.

In mixing or thinning down paints for use, it may be useful to mention that—for outdoor work, boiled oil is principally or wholly employed, unless it be for the decorative parts of houses, when a portion of turpentine and pale linseed oil is often added.—For in-door work, linseed oil, turpentine, and a little 'driers,' are generally used in the same way. The smaller the proportion of oil employed for the purpose, the less will be the gloss, and the greater the ultimate hardness of the coating. For 'flatted white,' &c., the colour being ground in oil, requires scarcely any further addition of that article, as the object is to have it 'dead' or dull. The best driers are ground litharge, and ground sugar of lead; the first for dark and middle tints, and the last for light ones.

To preserve mixed paints in pots from 'skinning over' or drying up, they should be kept constantly covered with water; or, what is better, with a thin film of linseed oil.

Brushes, when out of use, may be preserved in a similar manner to mixed paints. When dirty, or required for a paint of another colour, they may be cleaned with a little oil of turpentine, which may be either preserved for the same purpose another time, or may be allowed to deposit its colour, and then used to thin down paints as usual. In no case, however, should it be thrown back into the cistern or pan with the pure 'turps.'

Paints, Flex'ible. *Prep.* Take of good yellow soap (cut into slices), 2½ lbs.; boiling water, 1¼ gall.; dissolve, and grind the solution whilst hot with good oil paint, 1¼ cwt. *Used* to paint canvas.

Paints, Vitrifi'able. See ENAMEL, GLAZE, STAINED GLASS, &c.

PALLA'DIUM. Pd. A rare metal discovered by Dr. Wollaston in the ore of platinum, in 1803.

Prep. 1. A solution of the ore of platinum in *aqua regia*, from which most of the metal has been precipitated by chloride of ammonium, is neutralised by carbonate of sodium, and then treated with a solution of cyanide of mercury; the white insoluble precipitate (cyanide of palladium) is next washed, dried, and heated to redness; the residuum of the ignition (spongy palladium) is then submitted to a gradually increased pressure, and welding at a white heat, so as to form a button, in a similar manner to that adopted with platinum. *Prod.* Columbian ore of platinum, 1%; Uralian do., ·25 to ·75%.

2. The native alloy of gold and palladium (from the Brazils) is submitted to the operations of quartation and parting, the nitric acid employed being of the density of 1·3; the silver is next precipitased from the solution by means of a solution of common salt or dilute hydrochloric acid, and the decanted supernatant liquid, after evaporation to one half, is neutralised with ammonia, and concentrated so that crystals may form; these (chloride of palladium and ammonium) are cautiously washed in a little very cold water, dried, mixed with borax, and exposed in a crucible to the strongest heat of a powerful blast furnace, when a solid button of pure palladium is formed.

Prop., &c. Palladium closely resembles platinum in appearance, fusibility, malleability, and ductility; but it is less dense, and has a rather more silvery colour than that metal; it is freely soluble in aqua regia, and is slowly attacked by nitric acid, but the other acids exert little or no action on it; heated to redness in the air, a very superficial blue or purple film of oxide forms on the surface, which is again reduced at a white heat. It melts at 156° Wedgwood. Sp. gr. 11·3 to 12·1 (11·8—Wollaston; 12·14—Vauquelin). It readily unites with copper, silver, and some other metals, by fusion.

Tests. 1. The neutral solutions of palladium are precipitated in the metallic state by ferrous sulphate, dark brown by sulphuretted hydrogen, olive by ferrocyanide of potassium, and yellowish-white by cyanide of mercury.—2. A drop of tincture of iodine placed on the surface of metallic palladium, and then evaporated by the heat of a spirit lamp, leaves a black spot. By the last two tests palladium is readily distinguished from platinum.

Uses. It has been employed to form the scales of mathematical and astronomical instruments, and is used in dentistry. Its alloy with silver is a very valuable white metal. It is also used for making the smaller divisions of grain and gramme weights. Palladium is not tarnished by sulphuretted hydrogen. An alloy of 1 part of palladium and 100 parts of steel is well adapted for cutting instruments which require to be perfectly smooth on the edge.

PALMIT'IC ACID. $HC_{16}H_{31}O_2$. Prepared from palmitin (*see* next article), by saponification, as stearic acid is prepared from stearin. It forms pearly scales, and melts at 140° Fahr., like margaric acid, which it closely resembles.

PAL'MITIN. *Syn.* TRIPALMITIN. $C_3H_5(C_{16}H_{31}O_2)_3$. The solid portion of palm oil, purified by crystallisation from hot ether. White; soluble in ether and slightly so in hot alcohol; melts at 118° Fahr.; by saponification, it is converted into palmitic acid. (See *above*.)

PALPITA'TION. *Syn.* PALPUS, PALPITATIO CORDIS, L. A violent and irregular beating or action of the heart, either temporary or occasional. When it does not arise from sudden or violent agitation or distress of mind, it may be regarded as a symptom of a disturbance of the nervous functions by disease, in which case attention should be directed to the removal of the primary affection.

PAL'SY. See PARALYSIS.

PANACE'A. A term formerly applied to those remedies which were supposed to be capable of curing all diseases, and still applied to some quack medicines.

PANA'DA. See BREAD JELLY.

PAN'ARY FERMENTA'TION. The vinous fermentation as developed in the dough of bread.

PAN'CAKES. These are essentially fried batter, variously enriched and flavoured, according to the taste of the cook. When they contain fruit, fish, meat, or poultry, or are highly seasoned or ornamented, they are commonly called FRITTERS.

Prep. (M. Soyer.) Break 2 to 4 eggs into a basin, add 4 small table-spoonfuls of flour, 2 teaspoonfuls of sugar, and a little salt; beat the whole well together, adding, by degrees, ½ pint of milk, or a little more or less, depends ing on the size of the eggs and the quality of the flour, so as to form a rather thick batter; next add a little ginger, cinnamon, or any other flavour at will; lastly, put them into the pan, and when set, and one side brownish, lay hold of the frying-pan at the extremity of the handle, give it a sudden but slight jerk upwards, and the cake will turn over on the other side; when this is brown, dish up with sifted sugar, and serve with lemon. See FRITTERS.

PANIFICA'TION. The changes which occur in flour-dough under the influence of the fermentative process and heat, by which it is converted into bread.

PAPA'VERINE. *Syn.* PAPAVERINA. An alkaloid discovered by Merck in opium. It crystallises in needles; is insoluble in water; is slightly soluble in cold alcohol, and in ether; and forms crystallisable salts with the acids which possess little solubility. The hydrochlorate, one of the most characteristic of these compounds, crystallises in beautiful colourless prisms, which possess a high refractive power, and are only very slightly soluble in dilute hydrochloric acid.

PA'PER. *Syn.* CHARTA, PAPYRUS, L.; PAPIER, Fr. The limits of this work preclude the introduction of a description of the manufacture of this well-known and most useful article, which is now almost exclusively made by machinery of an elaborate and most ingenious description. We must, therefore, content ourselves with a short notice of a few of the preparations of the manufactured article. (See *below.*)

Good white paper should be perfectly devoid of odour, and when burnt it should leave a mere nominal amount of ash; digested in hot water, the liquid should be neutral to test paper, and not affected by sulphuretted hydrogen or the alkaline sulphurets, or by tincture of iodine. Coloured papers should not contain any deleterious matter.

Paper, Blistering. See VESICANTS.

Paper, Cloth. This is prepared by covering gauze, calico, canvas, &c., with a surface of paper pulp in a 'Foudrinier machine,' and then finishing the compound sheet in a nearly similar manner to that adopted for ordinary paper.

Paper, Col'oured. For those papers which are merely coloured on one side, the pigments, ground up with gum water or size, or the stains thickened with a little of the same, are applied with a brush, after which the sheets are suspended on a line to dry.

For paper coloured throughout its substance, the tinctorial matter is usually mixed with the pulp in the process of manufacture; or the manufactured paper is dipped into a bath of the colouring substance, and then hung up to dry.

Paper, Cop'ying. *Prep.* Make a stiff ointment with butter or lard and black lead or lamp black, and smear it thinly and evenly over soft writing paper, by means of a piece of flannel; the next day wipe off the superfluous portion with a piece of soft rag.

Use, &c. Placed on white paper and written on with a style or solid pen, a copy of the writing is left on the former. By repeating the arrangement, 2, 3, or more copies of a letter may be obtained at once. This paper, set up in a case, forms the ordinary 'manifold writer' of the stationers. The copying or transfer paper used for obtaining fac-similes of letters written with 'copying ink,' is merely a superior quality of bank-post paper.

Paper, Em'ery. See EMERY.

Paper, Glass. *Prep.* From powdered glass, as emery paper. *Used* to polish wood, &c. See GLASS (Powdered).

Paper, Gout. *Syn.* CHARTA ANTI-ARTHRITICA, L.; PAPIER FAYARD, Fr. *Prep.* 1. Euphorbium, 1 part; cantharides, 2 parts; (both in powder;) rectified spirit, 8 parts; ether, 3 parts; digest in a stoppered bottle, with frequent agitation, for a week; to the strained tincture add of Venice turpentine, 1 part; lastly, dip thin white paper into it, and dry the sheets in the air.

2. (Mohr.) Euphorbium, 1 dr.; cantharides, 4 drs.; rectified spirit (strongest), 5 oz.; make a tincture, to which add of Venice turpentine, 1½ oz., previously liquefied with resin, 2 oz.; and spread the mixture, whilst warm, very thinly on paper. *Used* as a counter-irritant in gout, rheumatism, &c.

Paper, Hydrograph'ic. An absurd name given to paper which may be written on with simple water or with some colourless liquid having the appearance of water.

Prep. 1. A mixture of nut-galls, 4 parts, and calcined sulphate of iron, 1 part (both perfectly dry and reduced to very fine powder), is rubbed over the surface of the paper, and is then forced into its pores by powerful pressure, after which the loose portion is brushed off. Writes black with a pen dipped in water.

2. From ferric sulphate and ferrocyanide of potassium, as the last. Writes blue with water.

3. As the last, but using sulphate of copper instead of sulphate of iron. Writes reddish-brown with water.

4. The paper is wetted with a colourless solution of ferrocyanide of potassium, and after being dried is written on with a colourless solution of ferric sulphate. Writes blue.

Obs. The above applications, we need scarcely say, are more amusing than useful. See SYMPATHETIC INK.

Paper, Incombus'tible. See INCOMBUSTIBLE FABRICS.

Paper, Irides'cent. *Prep.* (Beasley.) Sal ammoniac and sulphate of indigo, of each, 1 part; sulphate of iron, 5 parts; nut-galls, 8 parts; gum arabic, ⅛th part; boil them in water, and expose the paper washed with the liquid to (the fumes of) ammonia.

Paper, Issue. *Syn.* CHARTA AD FONTICULOS, L. *Prep.* (Soubeiran.) Elemi, spermaceti, and Venice turpentine, of each, 1 part; white wax, 2 parts; melt them together by a gentle heat, and spread the mixture on paper. *Used* to keep issues open.

Paper, Lithograph'ic. *Prep.* 1. Starch, 6 oz.; gum arabic, 2 oz.; alum, 1 oz.; make a strong solution of each separately, in hot water, mix, strain through gauze, and apply it whilst still warm to one side of leaves of paper, with a clean painting-brush or sponge; a second and a third coat must be given as the preceding one becomes dry; the paper must be, lastly, pressed, to make it smooth.

2. Give the paper 3 coats of thin size, 1 coat of good white starch, and 1 coat of a solution of gamboge in water; the whole to be applied cold, with a sponge, and each coat to be allowed to dry before the other is applied. The solutions should be freshly made.

Use, &c. Lithographic paper is written on with lithographic ink. The writing is transferred by simply moistening the back of the paper, placing it evenly on the stone, and then applying pressure. A reversed copy is obtained, which, when printed from, yields corrected copies, resembling the original writing or drawing. In this way the necessity of executing the writing or drawing in a reversed direction is obviated. See LITHOGRAPHY, INK, &c.

Paper, Oiled. *Prep.* Brush sheets of paper over with 'boiled oil,' and suspend them on a line till dry. Waterproof. Extensively employed as a cheap substitute for bladder and gut skin, to tie over pots and jars, and to wrap up paste blacking, ground white lead, &c.

Paper, Parch'ment. *Syn.* PAPYRIN, VEGETABLE PARCHMENT. *Prep.* 1. (Poumarède and Figuier.) Dip white unsized paper for half a minute in strong sulphuric acid, sp. gr. 1·842, and afterwards in water containing a little ammonia.

2. (W. E. Gaine, Patent 1857.) Plunge unsized paper for a few seconds into sulphuric acid diluted with half to a quarter its bulk of water (this solution being of the same temperature as the air), and afterwards wash with weak ammonia. This process, now extensively worked by Messrs. De la Rue and Co., produces a much better material than does that of Poumarède and Figuier.

Prop. A tough substance, resembling animal parchment, and applicable to the same purposes. It is largely *used* for covering pots of pickles and preserves, and by the chemist for the intervening membrane in experiments in diffusion. See DIALYSER, DIALYSIS, &c.

Paper, Ra"zor. Smooth unsized paper, one of the surfaces of which, whilst in a slightly damp state, has been rubbed over with a mixture of calcined peroxide of iron and emery, both in impalpable powder. It is cut up into pieces (about 5 × 3 inches), and sold in packets. *Used* to wipe the razor on, which thus does not require stropping.

Paper, Razor-strop. From emery and quartz (both in impalpable powder), and paper pulp (estimated in the dry state), equal parts, made into sheets of the thickness of drawing paper, by the ordinary process. For *use*, a piece is pasted on the strop and moistened with a little oil.

Paper, Res'in. *Syn.* POOR-MAN'S PLASTER; CHARTA RESINOSA, L. *Prep.* 1. Bees' wax, 1 oz.; tar and resin, of each, 3 oz.; melted together and spread on paper.

2. (Ph. Bor.) Paper, thinly spread over with black pitch. Calefacient, stimulant, and counter-irritant; in rheumatism, chest affections, &c.

Paper, Rheu'matism. See GOUT and RESIN PAPERS.

Paper, Safe'ty. *Syn.* PAPIER DE SURETÉ, Fr. White paper pulp mixed with an equal quantity of pulp tinged with any stain easily affected by chlorine, acids, alkalies, &c., and made into sheets as usual.

Paper, Test. *Syn.* CHARTA EXPLORATORIA, L. Under this head may be conveniently included all the varieties of prepared paper employed in testing. For this purpose sheets of unsized paper or of good ordinary writing paper (preferably the first), are uniformly wetted with a solution of the salt, or with a cold infusion or decoction of the tinctorial substance in distilled water, and are then hung up to dry in a current of pure air; they are, lastly, cut into pieces of a convenient size, and preserved in closed bottles or jars. For *use*, a small strip of the prepared paper is either dipped into or moistened with the liquid under examination, or it is moistened with distilled water, and then exposed to the fumes. A single drop, or even less, of any liquid may be thus tested.

The following are the principal test papers and their applications:—

PAPER, BRAZIL-WOOD. From the decoction. Alkalies turn it purple or violet; strong acids, red.

PAPER, BUCKTHORN. From the juice of the berries. Reddened by acids.

PAPER, CHERRY-JUICE. As the last.

PAPER, DAHLIA, GEORGINA P. From an infusion of the petals of the violet dahlia (*Georgina purpurea*). Alkalies turn it green; acids, red; strong caustic alkalies turn it yellow. Very delicate.

PAPER, ELDERBERRY. From the juice of the berries. As the last.

PAPER, INDIGO. From a solution of indigo. Decoloured by chlorine.

PAPER, IODIDE OF POTASSIUM.—*a.* From the solution in distilled water. Turned blue by an acidulated solution of starch.

b. From a mixture of a solution of iodide of potassium and starch paste. Turned blue by chlorine, ozone, and the mineral acids, and by air containing them.

PAPER, LEAD. From a solution of either acetate or diacetate of lead. Sulphuretted hydrogen and hydrosulphuret of ammonia turn it black.

PAPER, LITMUS. In general, this is prepared from infusion of litmus, without any precaution, but the following plan may be adopted when a superior test paper is desired:—

a. (Blue.) Triturate commercial litmus, 1 oz., in a wedgwood-ware mortar, with boiling water, 3 or 4 fl. oz.; put the mixture into a flask, and add more boiling water until the liquid measures fully ½ pint; agitate the mixture frequently until it is cold, then filter it, and divide the filtrate into two equal portions; stir one of these with a glass rod previously dipped into very dilute sulphuric acid, and repeat the operation until the litmus infusion begins to look very slightly red, then add the other half of the filtrate, and the two being mixed together, dip strips of unsized paper into the liquid, in the usual manner, and dry them. Acids turn it red; alkalies, blue. The neutral salts of most of the heavy metals also redden this, as well as the other blue test papers that are affected by acids.

b. (Red.) The treatment of the whole quantity of the infusion (see *above*) with the rod dipped in dilute sulphuric acid is repeated until the fluid begins to look distinctly red, when the paper is dipped into it as before. The alkalies and alkaline earths, and their sulphides, restore its blue colour; the alkaline carbonates and the soluble borates also possess the same property. Very sensitive. An extemporaneous red litmus paper may be prepared by holding a strip of the blue variety over a pot or jar into which 2 or 3 drops of hydrochloric acid have been thrown.

PAPER, MALLOW. From an infusion of the purple flowers of the common mallow. Affected like 'dahlia paper.'

PAPER, MANGANESE. From a solution of sulphate of manganese. Ozonised air blackens it.

PAPER, RHUBARB. From a strong infusion of the powdered root. Alkalies turn it brown; but boracic acid and its salts do not affect it. Very sensitive.

PAPER, ROSE. From the petals of the red rose, as the last. Alkalies turn it bright green. Dr. A. S. Taylor recommends the infusion to be very slightly acidulated with an acid before dipping the paper into it. More sensitive than turmeric paper.

PAPER, STARCH. From a cold decoction of starch. Free iodine turns it blue.

PAPER, SULPHATE OF IRON. From a solution of ferrous sulphate. As a test for hydrocyanic acid and the soluble cyanides.

PAPER, TURMERIC. From decoction of turmeric (2 oz. to the pint). It is turned brown by alkalies, and by boracic acid and the soluble borates. It is not quite so susceptible as some other tests, but the change of colour is very marked and characteristic.

Paper, Tra''cing. *Prep.* 1. Open a quire of smooth unsized white paper, and place it flat upon a table, then apply, with a clean 'sash tool,' to the upper surface of the first sheet, a coat of varnish made of equal parts of Canada balsam and oil of turpentine, and hang the prepared sheet across the line to dry; repeat the operation on fresh sheets until the proper quantity is finished. If not sufficiently transparent, a second coat of varnish may be applied as soon as the first has become quite dry.

2. Rub the paper with a mixture of equal parts of nut oil and oil of turpentine, and dry it immediately by rubbing it with wheaten flour; then hang it on a line for 24 hours, to dry.

Obs. Both the above are used to copy drawings, writing, &c. If washed over with ox-gall and dried, they may be written on with ink or water colours. The first is the whitest and clearest, but the second is the toughest and most flexible. The paper prepared from the refuse of the flax-mills, and of which bank-notes are made, is also called 'tracing paper.' and sometimes 'vegetable paper.' This requires no preparation; but though very flexible, it has little strength.

Paper, Var'nished. Before proceeding to varnish paper, card-work, pasteboard, &c., it is necessary to give it 2 or 3 coats of size, to prevent the absorption of the varnish, and any injury to the colour or design. The size may be made by dissolving a little isinglass in boiling water, or by boiling some clean parchment cuttings until they form a clear solution. This, after being strained through a piece of clean muslin, or, for very nice purposes, clarified with a little white of egg, is applied by means of a small clean brush, called by painters a sash tool. A light, delicate touch must be adopted, especially for the first coat, lest the ink or colours be started, or smothered. When the prepared surface is perfectly dry, it may be varnished in the usual manner. See MAPS, VARNISH, &c.

Paper, Wa''fer. See WAFERS.

Paper, Waxed. *Prep.* Place cartridge paper, or strong writing paper, on a hot iron plate, and rub it well with a lump of bees' wax. *Used* to form extemporaneous steam or gas pipes, to cover the joints of vessels, and to tie over pots, &c.

PAPER HANG'INGS. The ornamental paper used to cover the walls of rooms, &c. Under the old system, the paper, after being sized and prepared with a ground colour, had the pattern produced on it by the common process of 'stencilling,' a separate plate being employed for each colour that formed the pattern. To this succeeded the use of wooden blocks, the surface of which bearing the design in relief, and being covered with colour, was applied by simple hand pressure on the paper, in a precisely similar manner to that adopted in the block-printing of calicoes. The cylinder calico-printing machine has now been successfully applied to the manufacture of paper hangings.

The colours employed for paper hangings are—

BLACKS. Frankfort, ivory, and blue black.

BLUES. Prussian blue, verditer, and factitious ultramarine.

BROWNS. Umber (raw and burnt), and mixtures.

GRAYS. Prussian blue and blue black, with Spanish white.

GREENS. Brunswick green, Scheele's g., Schweinfurt g., and green verditer; also mixtures of blues and yellows.

REDS. Decoctions of Brazil wood (chiefly), brightened with alum or solution of tin; the red ochres; and, sometimes, red lake.

VIOLETS. Decoction of logwood and alum; also blues tempered with bright red.

YELLOWS. Chrome yellow, decoction of French berries or of weld, terra di sienna, and the ochres.

WHITES. White lead, sulphate of baryta, plaster of Paris, and whiting, and mixtures of them.

The vehicle employed to give adhesiveness and body to the colours is a solution of gelatine or glue, sufficiently strong to gelatinise on cooling.

The satiny lustre observable in some paper hangings (SATIN PAPERS) is produced by dusting finely powdered French chalk over the surface, and rubbing it strongly with a brush or burnisher. The ground for this purpose is prepared with plaster.

FLOCK and VELVET PAPERS are produced by

covering the surface of the pattern with a mordant formed with boiled oil thickened with white lead or ochre, and then sprinkling powdered woollen flocks on it. These are previously dyed, and ground to the required fineness in a mill.

PAPIER-MÂCHÉ. Pulped paper moulded into forms. It possesses great strength and lightness. It may be rendered partially waterproof by the addition of sulphate of iron, quicklime, and glue or white of egg to the pulp; and incombustible, by the addition of borax and phosphate of soda. The papier-mâché tea-trays, waiters, snuff-boxes, &c., are prepared by pasting or gluing sheets of paper together, and then submitting them to powerful pressure, by which the composition acquires the hardness of board when dry. Such articles are afterwards japanned, and are then perfectly waterproof.

The refuse of the cotton and flax mills, and numerous other substances of a like character, are now worked up as papier-mâché, and the manufactured articles formed of them are indistinguishable from those prepared directly from paper.

PAPY'RIN. See PAPER (Parchment).

PAR'ACHUTE. In aërostation, an instrument or apparatus having for its object to retard the descent of heavy bodies through the air. The only form of parachute which has been hitherto adopted with success is that of the common umbrella when extended. The materials of which the apparatus is made are canvas and cord, both light but strong, and carefully put together. The car to contain the adventurer resembles that of the balloon, only smaller.

It is estimated that a circular parachute, to descend in safety with an adult, weighing, with the apparatus, 225 lbs., must have a diameter of at least 30 feet. Its terminal velocity would then be at the rate of 12 to 13 feet per second, or about 6¼ miles per hour; and the shock experienced on contact with the earth would be equal to that which the aëronaut would receive if he dropped freely from a height about 2¼ feet,

Several descents from balloons, after they have acquired a great elevation, have been effected without accident by means of parachutes. Unfortunately, however, any want of integrity in the machine, or any accident which may happen to it after its detachment from the balloon, is irreparable and fatal.

PARACYAN'OGEN. The brown solid matter left in the retort when cyanide of mercury is decomposed by heat. It is isomeric with cyanogen.

PARAFFIN. *Syn.* TAR-OIL STEARIN. This remarkable hydrocarbon is one of the several substances discovered by Reichenbach in WOOD-TAR.

Prep. 1. (From WOOD-TAR. Reichenbach.) Distil beech tar to dryness, rectify the oily portion of the product which is heavier than water, until a thick matter begins to rise, then change the receiver, and moderately urge the heat as long as anything passes over; next digest the product in the second receiver, in an equal measure of alcohol of ·833, gradually add 6 or 7 parts more of alcohol, and expose the whole to a low temperature; crystals of paraffin will gradually fall down, which, after being washed in cold alcohol, must be dissolved in boiling alcohol, when crystals of pure paraffin will be deposited as the solution cools.

2. (From COAL—James Young, Patent 1850.) The details of this process for obtaining paraffin and its congeners by the slow distillation of coal (preferably 'Boghead') are given in our article on PARAFFIN OIL. The solid paraffin is separated from the last products, or 'heavy oils,' by artificial cold; it is then melted and run into moulds.

3. (From RANGOON PETROLEUM—Patent.) In this process, which is worked by Price's Candle Company, superheated steam is employed as the heating agent. The paraffin, or 'BELMONTINE,' as it is called, is the last product which distils over.

4. (From PEAT.) The various processes which have been suggested for obtaining paraffin from peat, turf, &c., are similar in principle to Young's. The great point is to conduct the distillation at as low a temperature as possible.

Prop. A white, hard, translucent body, melting at 110° Fahr. and upwards, according to its source, and burning with a bright white flame. It has great stability—sulphuric acid, chlorine, and nitric acid below 212° exerting no action upon it. Dr. Anderson states that its composition and properties vary with the source from which it is derived. With respect to the melting point, this variation is very remarkable. Thus, Young's paraffin, from Boghead coal, melts, according to the observations of Dr. Anderson, at 114°, while that from Rangoon petroleum ('belmontine'), melts at 140°, and that from turf at 116°.

Uses. Paraffin is now largely used for making candles, for which purpose it is specially adapted, being a most elegant substance, and surpassing all other candle materials, even spermaceti, in illuminating power. Its property of not being acted upon by acids or alkalies renders it suitable for stoppers for vessels holding chemical liquids; also for electrotype moulds. It is not acted upon by ozone, so that it has been employed with great advantages in experiments on this body for rendering air tight the joints formed by the union of glass tubes. As it contains no oxygen, it might be employed to protect oxydisable metals like sodium and potassium from contact with the air. One use of paraffin candle-ends will commend them to the ladies of the household—a small piece of paraffin added to starch will be found to give a gloss and brilliancy of surface to the starched linen that can be attained by no other addition.

PARAFFIN OIL. See OILS.

PARAL'YSIS. *Syn.* PALSY. A loss or considerable diminution of power of voluntary motion, or functional action, of any part of the body. In its most usual form, one side only of the body is affected. It not uncommonly seizes the lower extremities, or all parts below the pelvis; sometimes the arms only; and occasionally a part, as one side of the face, one eyelid, the tongue, or the muscles of deglutition. In these cases, the speech frequently becomes indistinct and incoherent, and the memory and judgment impaired, whilst the distorted features assume a more or less revolting aspect.

The causes of paralysis are various. It may be occasioned by pressure on particular parts of the brain, the spinal marrow, or the nerves; by poisons, the long-continued use of sedatives, local injuries, the sudden suppression of profuse and habitual evacuations, and by whatever tends to greatly relax or enervate the system. It may also be a consequence of an attack of apoplexy, or it may be symptomatic of other diseases, as scrofula, syphilis, and worms. When it is of a distinctly local character, it may arise from excessive use or undue employment of the part or organ. That of old age is, probably, a mere consequence of the failing nervous energy of the system being unequally distributed.

Palsy usually comes on with a sudden and immediate loss of the motion and sensibility of the parts; but, in a few instances, it is preceded by a numbness, coldness, and paleness; and, sometimes, by slight convulsive twitches. If the disease affects the extremities, and has been of long duration, it not only produces a loss of motion and sensibility, but likewise a considerable flaccidity and wasting away of the muscles of the parts affected.

When palsy attacks any vital part, such as the brain, heart, or lungs, it soon terminates in death.

The treatment of paralysis depends upon a careful consideration of its cause. The first object should be, as far as possible, to remove any compressing force, and to gradually arouse the torpid portion of the nervous system. In general, more or less depletion will be found beneficial, together with rather active purgation, and nervous stimulants, as ammonia, musk, &c. Blisters to the head and neck are also appropriate. With the debilitated and aged, venesection must be avoided. Stimulant and rubefacient frictions and liniments, the vapour bath, and other like remedies, also frequently prove useful. In local attacks of the disease, as the loss of use of one of the hands, arms, legs, &c., no agent has proved so generally successful as voltaic electricity. For this purpose the current should be in one direction only, and continued uninterruptedly for some *time daily*. When the direction of the current is alternate, with slight shocks, as in the common coil machine, this agent is of doubtful utility, except for occasional use. In *all* cases medical aid should be sought as early as possible.

PARANAPH'THALIN. *Syn.* ANTHRACENE. A substance found in the naphthalin of coal-tar, from which it may be separated by digestion in alcohol, which dissolves the ordinary naphthalin and leaves the paranaphthalin in an insoluble form; it is then purified by redigestion in hot alcohol, and final sublimation.

Prop., &c. White; crystalline; inflammable; soluble in ether and oil of turpentine; melts at 416° Fahr. Naphthalin and paranapthalin are isomeric compounds.

PARAPEC'TIN. See PECTIN.

PAR'ASITES. The parasitical animals that infest the human body are referred to under the heads ACARI and PEDICULI.

PARATARTAR'IC ACID. See RACEMIC ACID.

PARCH'MENT. See VELLUM, and PAPER (Parchment).

PARCHMENT PAPER. See PAPER.

PAREGOR'IC. See TINCTURE OF CAMPHOR (Compound).

Paregoric, Scotch. See TINCTURE OF OPIUM (Ammoniated).

PAREI'RA BRA'VA. See VELVET LEAF.

PARR. A name applied to the salmon until near the end of its second year, when it loses its dark lateral bars by the superaddition of a silvery pigment. It was formerly regarded as a distinct species.

PARS'LEY. *Syn.* PETROSELINUM, L. This well-known herb is the *Apium petroselinum*. The root is diuretic; the fruit (seed) carminative; the leaves are a pleasant stimulating salad and condiment, and are much used to flavour broth and soup. "The fruit is a deadly poison to parrots." (Lind. & Burnett.)

PARS'NEP. The root of *Pastinaca sativa*. *Used* as a table vegetable. The juice is sometimes made into wine.

PASTE. *Syn.* PASTA, L.; PÂTE, Fr. This word is very loosely applied to substances and preparations differing so widely from each other, that it would be scarcely possible to class them together. We shall, therefore, refer the reader to the individual articles. The pastes (pâtes) of French pharmacy are compound medicines of the consistence of hard dough, and which do not stick to the fingers. They are formed of sugar and gum, dissolved in water or in some medicated liquid. They are evaporated, so as to unite these principles by degrees, and give them the pliancy and the firmness of paste. They are employed internally in doses more or less variable, in a similar manner to lozenges. "Pâtes, properly so called, are divided into transparent, or such as are made without agitation, like jujubes of brown liquorice; and opaque, or such as are made with agitation, like the pâtes of marshmallow, lichen, &c." (Trousseau and Reveil.) See PASTES (Artificial Gems), PASTRY, and *below*.

Paste, Al'mond. *Syn.* PASTA AMYGDALINA, P. AMYGDALARUM, P. REGIA, L.; PÂTE ROYALE, Fr. *Prep.* I. (MOIST.)—*a.* Take of blanched Valentia almonds, 4 oz.; reduce them to a very smooth paste by patient pounding in a clean mortar, adding, towards the last, a little rose water, with some eau de Cologne, or 3 or 4 drops of otto of roses or neroli, or an equivalent quantity of any other perfume, according to the fancy of the artiste.

b. From bitter and sweet almonds (blanched), equal parts; rose water, q. s. It requires no other perfume.

c. To either of the preceding add of spermaceti, ⅛ oz. The white of an egg, or ¼ oz. of white soap, is added by some makers. With about ½ dr. of powdered camphor to each oz. of the above, it forms the 'camphorated almond paste' of the shops.

d. Take fine Narbonne honey and white bitter paste (see *below*), of each, 1 lb.; beat them to a smooth paste, then add, in alternate portions, of oil of almonds, 2 lbs.; yolks of 5 eggs; and reduce the whole to a perfectly homogeneous pasty mass. Much esteemed. It is commonly sold under the name of 'honey paste,' 'pâte royale,' &c. In a similar manner are made nosegay, orange, rose, vanilla, and other like pastes having almonds for a basis, by merely adding the respective perfumes.

2. (PULVERULENT.)—*a.* (Gray.) Prepared from the cake of bitter almonds from which the oil has been thoroughly expressed, by drying, grinding, and sifting it.

b. (Bitter white.) As the last, but the almonds are blanched before being pressed.

c. (Sweet white.) As the last, but using sweet almonds.

Obs. All the above are used as cosmetics, to soften and whiten the skin, prevent chaps, abrasions, chilblains, &c. The honey paste, and the sweet and bitter white pastes, are those most esteemed. (See *below*.)

Paste, Almond. (In confectionery.) *Prep.* 1. Take of Valentia almonds, 3 lbs.; bitter do., ¼ lb.; blanch them, and reduce them to a very smooth paste by pounding, then put them into a clean copper pan along with white sugar and good gum arabic, of each, 1 lb.; (the last previously dissolved in about a pint of water;) apply a gentle heat, and stir until the whole is mixed and has acquired a proper consistence, then pour it out on a smooth, oiled, marble slab, and when cold cut it into squares.

2. As the last, but when the mixture has acquired the consistence of thick honey, setting it aside to cool; when nearly cold, the whites of 6 eggs are to be added, and heat being again gradually applied, the whole is to be stirred until it acquires the proper consistence, as before.

3. Blanched sweet almonds and white sugar, of each, 1 lb.; blanched bitter almonds and powdered gum, of each, 3 oz.; beat them, in the cold, to a perfectly smooth paste, with orange-flower water or rose water, q. s., so that it may be sufficiently stiff not to stick to the fingers, and then cut the mass into squares, as before. The above are eaten as confections.

Paste, Ancho'vy. *Prep.* Remove the larger bones from the fish, and then pound them to a smooth paste in a marble mortar, adding a little bay-salt and cayenne pepper, at will; next rub the pulp through a fine hair sieve, and about 3-4ths fill the pots with it; lastly, cover the surface of each to the depth of about ⅛ inch with good butter in a melted state. It should be kept in a cool situation. Other fish pastes, as those of bloaters, lobsters, shrimps, caviare, &c., are made in a similar manner.

Paste, Arsen'ical. See CAUSTICS, PATENT MEDICINES, and POWDERS.

Paste, Baudry's. See PECTORAL PASTE (*below*).

Paste, Bird. See GERMAN PASTE (page 561).

Paste, Black Currant. As black currant lozenges, but simply cutting the mass into dice or square.

Paste, Car'rageen. *Prep.* From Irish moss, as the lichen paste of the P. Cod. (see *below*).

Paste, Chinese'. *Prep.* From bullock's blood, 10 lbs., reduced to dryness by a gentle heat, then powdered, and mixed with quicklime, also in fine powder, 1 lb. It is used as a cement, made into a paste with water, and at once applied.

Paste of Chlo''ride of Zinc. See CAUSTICS.

Paste of Dates. *Syn.* PASTA DACTYLIFERÆ, P. DACTYLORUM, L.; PÂTES DE DATTES, Fr. From dates (stoned), as jujube paste. Pectoral, and slightly astringent. Paste of gum senegal is usually sold for it.

Paste, De Handels. *Prep.* From opium, ½ dr.; camphor, 1 dr.; (both in powder;) extracts of belladonna and henbane, of each, 1 dr.; oil of cajeput and tincture of cantharides, of each, 10 or 12 drops; distilled water of opium (or of lettuce), q. s. In toothache.

Paste, Depil'atory. *Syn.* PASTA EPILATORIA, L. Several preparations of this character are noticed at pages 400-1. A mixture of slacked lime, 2 parts, and water, 3 parts, saturated with sulphuretted hydrogen, is said to be so powerful, that "a layer a line in thickness denudes the scalp in three minutes." (Beasley.)

Paste of Figs. *Syn.* PASTA CARICARUM, P. FICARIA, L. *Prep.* 1. From figs, as jujube paste.

2. (Soubeiran.) Pulp of figs, 1 part; press it through a sieve, mix it with powdered sugar, 4 parts, concentrated by a gentle heat (if ne-

oz.; eau de Cologne, q. s. It should not be put into the pots until the next day, and should be afterwards well preserved from the air. Much prized by smokers, and by persons troubled with a fetid breath from rotten teeth.

2. (CORAL PASTE; OPIAT DENTIFRICE ROUGE.) From prepared coral, 8 oz.; cuttle-fish bone, 4 oz.; mastic, 2 oz.; cochineal, ½ oz.; honey, ¾ lb.; essence of ambergris, 1 fl. dr.; oil of cloves, ½ fl. dr., dissolved in rectified spirit, 1 fl. oz. As the last. Cleans the teeth rapidly.

3. (Dyon's CHARCOAL PASTE.) From chlorate of potassa, 1 dr.; mint water, 1 fl. oz.; triturate until dissolved, then add, of powdered charcoal, 2 oz.; honey, 1 oz.

4. (MAGIC PASTE.) From white marble dust, 4 oz.; pumice stone (in impalpable powder), 3 oz.; rose pink, 1 oz.; honey, ½ lb.; otto of roses, 15 drops. Rapidly whitens the teeth, but it should not be used too freely, nor too frequently.

5. (P. Cod.) Prepared coral, 4 oz.; bitartrate of potassa, 2 oz.; cuttle-fish bone and cochineal, of each, 1 oz.; alum, ½ dr.; Narbonne honey, 10 oz.; with essential oil, q. s. to aromatize the mixture

6. (Pelletier's ODONTINE.) This is stated to be a mixture of pulverized sepia-bone, butter of cacao, and honey, with essential oil.

7. (ROSE PASTE.) Coral paste scented with roses, or the following: — Cuttle-fish bone, 1 oz.; prepared chalk, 2 oz.; cochineal, ½ dr.; honey of roses, 3 oz.; otto of roses, 6 drops.

8. (SOLUBLE PASTE, SALINE DENTIFRICE.) From bitartrate of potassa or sulphate of potassa (in fine powder), 3 oz.; honey of roses, 2 oz.

9. (SPANISH DENTIFRICE, CASTILIAN TOOTH CREAM.) From Castile soap (in fine powder) and cuttle-fish bone, of each, 2 oz.; honey of roses, 5 oz. An excellent preparation. It is superior to all the other pastes for removing tartar and animalculæ from the teeth.

10. (VANILLA PASTE.) From red cinchona bark, 2 drs.; vanilla, 1 dr.; cloves, ½ dr.; (the last two reduced to powder by trituration with) white sugar, 1 oz.; cuttle-fish bone and marble dust, of each, ½ oz.; syrup of saffron, q. s.

11. (VIOLET PASTE.) From prepared chalk and cuttle-fish bone, of each, 3 oz.; powdered white sugar, 2 oz.; orris root, 1 oz.; smalts, ¼ oz.; syrup of violets, q. s. to mix.

12. (Winckler's ROSEATE DENTIFRICE.) From cuttle-fish bone, 1 part; conserve of roses (Ph. L.), 3 parts; white otto of roses, 2 drops to the oz.

13. Chalk, 8 oz.; myrrh and rhatany root, of each, 2 oz.; orris root, 1 oz.; honey of roses, q. s. to mix. In foul and spongy gums.

Paste, Tooth'ache. See ODONTALGIC PASTE.

Paste, Tor'mentil. *Syn.* PASTA TORMENTILLÆ, L. *Prep.* (Morin.) Powdered tormentil root made into a paste with white of egg. In whitlow; applied on linen. Mixed with an equal weight of simple syrup, it has also been recommended in dysentery and diarrhœa.

Paste, Vienna. See POTASSA WITH LIME.

Paste, Vohler's. *Prep.* From dragon's blood, 1 dr.; powdered opium, 2 drs.; powdered gums of mastic and sandarach, of each, 4 drs.; oil of rosemary, 20 drops; tincture of opium, q. s. to form a paste. In toothache.

Paste, Ward's. See CONFECTION OF PEPPER.

PASTES. *Syn.* ARTIFICIAL GEMS, FACTITIOUS G.; PIERRES PRÉCIEUSES ARTIFICIELLES, Fr. Vitreous compounds made in imitation of the gems and precious stones. The substances which enter into their composition, and the principles on which their successful production depends, have been already briefly noticed. The present article will, therefore, be confined to giving the reader a few original formulæ, together with several others carefully selected from the most reliable English and Continental authorities. Like enamels the artificial gems have for their basis a very fusible, highly transparent and brilliant, dense glass, which is known under the name of 'frit,' 'paste,' 'strass,' 'flux,' 'fondant,' or 'Mayence base,' and which in its state of greatest excellence constitutes the 'artificial diamond.' For convenience, this will be noticed here under its last synonym. (See *below*, also Ure's 'Dictionary of Arts,' &c.)

Amethyst. 1. Paste or strass, 500 grs.; oxide of manganese, 3 grs.; oxide of cobalt, 24 grs.

2. (Douault-Wiéland.) Strass, 4608 grs.; oxide of manganese, 36 grs.; oxide of cobalt, 2 grs.

3. (Lançon.) Strass, 9216 grs.; oxide of manganese, 15 to 24 grs.; oxide of cobalt, 1 gr.

Aqua Marina. From strass, 4800 grs.; glass of antimony, 30 grs.; oxide of cobalt, 1½ gr. See BERYL, of which this is merely a variety.

Aventurine. 1. From strass, 500 grs.; scales of iron, 100 grs.; black oxide of copper, 50 grs.; fuse until the black oxide of copper is reduced to the reguline form, then allow the mass to cool very slowly, so that the minute crystals of metal may be equally diffused through it. Has a rich golden iridescence.

2. As the last, but submitting oxide of chromium for the protoxide of copper. Appears brown, filled with countless gold spangles; or, when mixed with more paste, of a greenish gray, filled with green spangles.

Beryl. (Douault-Wiéland.) Strass, 3456 grs.; glass of antimony, 24 grs.; oxide of cobalt, 1½ gr. See AQUA MARINA.

Carbuncle. See GARNET.

Chrysolite. From strass, 7000 grs.; pure calcined sesquioxide of iron ('crocus martis'), 65 grs.

Cornelian. 1. (Red.) From strass, 7000 grs.; glass of antimony, 3500 grs.; calcined peroxide of iron, 875 grs.; binoxide of manganese, 75 grs.

2. (White.) From strass, 7200 grs.; calcined bones, 250 grs.; washed yellow ochre, 65 grs.

Diamond. 1. From rock crystal (purest), 1600 grs.; borax, 560 grs.; carbonate of lead (pure), 3200 grs.; oxide of manganese, ½ to 1 gr.; powder each separately, mix them together, fuse the mixture in a clean crucible, pour the melted mass into water, separate any reduced lead, and again powder and remelt the mass.

2. Pure silica, 150 grs.; pure litharge, 250 grs.; borax and nitre, of each, 50 grs.; arsenious acid, 21 grs.

3. (Douault-Wiéland.)—*a.* From rock crystal, 4056 grs.; minium, 6300 grs.; potash, 2154 grs.; borax, 276 grs.; arsenic, 12 grs.

b. From rock crystal, 3600 grs.; ceruse of Clichy (pure carbonate of lead), 8508 grs.; potash, 1260 grs.; borax, 360 grs.

4. (Fontanier.) Pure silica, 8 oz.; salt of tartar, 24 oz.; mix, bake, cool, treat the fused mixture with dilute nitric acid until effervescence ceases, and afterwards with water as long as the washings affect litmus paper; next dry the powder, add to it of pure carbonate of lead, 12 oz., and to every 12 oz. of the mixture add of borax, 1 oz.; triturate in a porcelain mortar, melt in a clean crucible, and pour the fused mass into cold water; dry, powder, and repeat the process a second and a third time in a clean crucible, observing to separate any revived lead. To the third frit add of nitre, 5 drs., and again melt. The product is perfectly limpid and extremely brilliant.

5. (Lançon.) Litharge, 100 grs.; pure silica, 75 grs.; white tartar or potash, 10 grs.

6. (Loysel.) · Pure silica, 100 parts; red oxide of lead (minium), 150 parts; calcined potash, 30 to 35 parts; calcined borax, 10 parts; arsenious acid, 1 part. This produces a paste which has great brilliancy and refractive and dispersive powers, and also a similar specific gravity to the oriental diamond. It fuses at a moderate heat, and acquires the greatest brilliancy when remelted, and kept for 2 or 3 days in a fused state, in order to expel the superabundant alkali, and perfect the refining. ('Polytech. Journ.') The products of the above formula are not only employed to imitate the diamond, but they also form the basis of the other factitious gems. (See *above.*)

7. (Yellow diamond.) Strass, 500 grs.; glass of antimony, 10 grs.

Eagle Marine. From strass, 3840 grs.; copper stain, 72 grs.; pure zaffre, 1 gr.

Emerald. 1. From strass, 7000 grs.; carbonate of copper, 65 gr.; glass of antimony, 7 grs.

2. Paste, 960 grs.; glass of antimony, 42 grs.; oxide of cobalt, 3½ grs.

3. (Douault-Wiéland.) Paste, 4608 grs.; green oxide of copper, 42 grs.; oxide of chrome, 2 grs.

4. (Lançon.) Paste, 9612 grs.; acetate of copper, 72 grs.; peroxide of iron, 1½ gr.

Garnet. 1. Paste or strass, 1200 grs.; glass of antimony, 580 grs.; purple of cassius and binoxide of manganese, of each, 3 grs.

2. (Douault-Wiéland.) Paste, 513 grs.; glass of antimony, 256 grs.; purple of cassius and oxide of manganese, of each, 2 grs.

3. (Vinegar garnet.) From paste, 7000 grs.; glass of antimony, 3460 grs.; calcined peroxide of iron, 56 grs.

Lapis Lazuli. From paste, 7000 grs.; calcined horn or bones, 570 grs.; oxides of cobalt and manganese, of each, 24 grs. The golden veins are produced by painting them on the pieces with a mixture of gold powder, borax, and gum water, and then gently heating them until the borax fluxes.

Opal. 1. From strass, 960 grs.; calcined bones, 48 grs.

2. (Fontanier.) Paste, 1 oz.; horn silver, 10 grs.; calcined magnetic ore, 2 grs.; absorbent earth (calcined bones), 26 grs.

Ruby. 1. Paste, 45 parts; binoxide of manganese, 1 part.

2. Paste, 1 lb.; purple of cassius, 3 dr.

3. (Douault-Wiéland.)—*a.* From paste, 2880 parts; oxide of manganese, 72 parts.

b. Topaz-paste that has turned out opaque, 1 part; strass, 8 parts; fuse them together for 30 hours, cool, and again fuse it in small pieces before the blowpipe. Very fine.

4. (Fontanier.) Strass, 16 oz.; precipitate of cassius, peroxide of iron, golden sulphide of antimony, and manganese calcined with nitre, of each, 168 grs.; rock crystal, 2 oz., or more.

5. Paste and glass of antimony, of each, 8 oz.; rock crystal, 1 oz.; purple of cassius, 1½ dr. Turns on the orange.

Sapphire. 1. From strass, 3600 grs.; oxide of cobalt, 50 grs.; oxide of manganese, 11 grs.

2. (Douault-Wiéland.) Paste, 4608 grs.; oxide of cobalt, 68 grs.; fuse in a little Hessian crucible for 30 hours.

3. (Fontaner.) Paste, 8 oz.; oxide of cobalt, 49 grs.

Topaz. 1. From strass, 1050 grs.; glass of antimony, 44 grs.; purple of cassius, 1 gr.

2. (Douault-Wiéland.) Paste, 3456 grs.; calcined peroxide of iron, 36 grs.

Turquoise. From blue paste, 20 to 24 parts; calcined bones, 1 part.

Concluding remarks. It is absolutely necessary for the successful application of the preceding formulæ that the substances employed should be perfectly free from impurities, more particularly those of a mineral kind. The litharge, oxide of lead, and carbonate of lead, above all things, must be entirely free from oxide of tin, as the smallest particle of that substance may impart a 'milkiness' to the paste. All the ingredients must be separately reduced to powder, and, after being mixed, sifted through lawn. The fusion must be carefully conducted and continuous, and the melted mass should be allowed to cool very slowly, after having been left in the fire from 24 to 30 hours, at the least. Hessian crucibles are preferred for this purpose, and the heat of an ordinary pottery or porcelain kiln is sufficient in most cases; but a small wind-furnace, devoted exclusively to the purpose, is, in general, more convenient. It is found that the more tranquil, continuous, and uniform the fusion, the denser and clearer is the paste, and the greater its refractive power and beauty.

All the coloured vitreous compounds noticed under GLASS may be worked up as ornamental stones, in the same way as those just referred to.

The following method of obtaining artificial rubies and emeralds, first pointed out by Boettger, is exceedingly simple and inexpensive, and deserves the serious attention of those interested in this ingenious art:—Recently precipitated and well-washed hydrate of aluminum is moistened with a few drops of neutral chromate of potassium, and kneaded so that the mass assumes a tinge scarcely perceptible; it is then rolled up into small sticks, about the thickness of a finger, and slowly dried, taking the precaution to fill the fissures (if any) that form during desiccation with fresh hydrate of aluminum. When perfectly dry, and after having been submitted to a gentle heat, one end of these sticks is brought into the termination of the flame of an oxy-hydrogen blowpipe, until a portion of the mass is fused into a small globule. After the lapse of a few minutes, several minute balls form, having a diameter of some millimètres, and of such intense hardness that quartz, glass, topaz, and granite, may be easily and perceptibly scratched with them. These, when cut and polished, appear, however, slightly opaque. By employing nitrate of nickel in lieu of chromate of potassium, green-coloured globules, closely resembling the emerald, are obtained.

By the substitution of oxide of chromium for chromate of potassium, Mr. Cooley produced factitious gems of considerable hardness and beauty, though slightly opaque in some portion of the mass. The addition of a very little silica prevented, in a great measure, this tendency to opacity.

It may be observed that the beauty of pastes of factitious gems, and especially the brilliancy of mock diamonds, is greatly dependent upon the cutting, setting up, and the skilful arrangement of the foil or tinsel behind them. See ENAMEL, FOILS, GEMS, GLASS, &c.

PAS'TELS. [Fr.] Coloured crayons.

PAS'TIL. *Syn.* PASTILLE; PASTILLUS, PASTILLUM, L. A lozenge or confection. The pastilles (PASTILLI) of French pharmacy, are merely 'confectionery drops' aromatised or medicated. The name is also given to mixtures or odorous substances made up into small cones and burnt as incense. (See *below*).

Pastils, Explo'sive. Fumigating pastilles, containing a little gunpowder. *Used* to produce diversion, but they often prove far from harmless.

Pastils, Fumiga'ting. *Syn.* AROMATIC PASTILLES, INCENSE P.; PASTILLI FUMANTES, P. ODORATI, L. *Prep.* 1. Benzoin, 4 oz.; cascarilla, ½ oz.; nitre and gum arabic, of each, 3 drs.; myrrh, 1 dr.; oils of nutmeg and cloves, of each, 25 drops; charcoal, 7 oz.; all in fine powder; beat them to a smooth ductile mass with cold water, q. s.; form it into small cones with a tripod base, and dry them in the air.

2. (Henry and Guibourt.) Powdered gum benzoin, 16 parts; balsam of tolu and powdered sandal wood, of each, 4 parts; a light charcoal (Linden), 48 parts; powdered tragacanth and true labdanum, of each, 1 part; powdered nitre and gum arabic, of each, 2 parts; cinnamon water, 12 parts; as above.

3. (P. Cod.) Benzoin, 2 oz.; balsam of tolu and yellow sandal wood, of each, 4 drs.; nitre, 2 drs.; labdanum, 1 dr.; charcoal, 6 oz.; mix with a solution of gum tragacanth, and divide the mass into pastilles, as before.

4. (PASTILLES À LA FLEUR D'ORANGE,) For powdered roses in the next formula substitute pure orange powder, and for the essence of roses use pure neroli.

5. (PASTILLES À LA ROSE.) Gum benzoin, olibanum (in tears), and styrax (in tears), of each, 12 oz.; nitre, 9 oz.; charcoal, 4 lbs.; powder of pale roses, 1 lb.; essence of roses, 1 oz.; mix with 2 oz. of gum tragacanth, dissolved in rose water, 1 quart.

6. (PASTILLES À LA VANILLE.) Gum benzoin, styrax, and olibanum (as last), of each, 12 oz.; nitre, 10 oz.; cloves, 8 oz.; powdered vanilla, 1 lb.; charcoal, 4½ lbs.; oil of cloves, ½ oz.; essence of vanilla, 7 or 8 fl. oz.; as before.

Obs. The products of the above formula are all of excellent quality. They may be varied to please the fancy of the artiste, by the addition or substitution of other perfumes or aromatics. Cheaper pastilles may be made by simply increasing the quantity of the charcoal and saltpetre. The whole of the ingredients should be reduced to fine powder before mixing them. The use of musk and civet, so often ordered in pastilles, should be avoided, as they yield a disagreeable odour when burned. The addition of a little camphor renders them more suitable for a sick chamber. The simplest and most convenient way of forming the mass into cones is by pressing it into a mould of lead or porcelain.

Pastilles are burned either to diffuse a pleasant odour, or to cover a disagreeable one. For this purpose they are kindled at the apex, and set on an inverted saucer or a penny-piece to burn. Persons who use them frequently employ a small china or porcelain toy ('pastille house') sold for the purpose.

Pastils, Mouth. *Syn.* BREATH PILLS, CACHOU LOZENGES; PASTILLI COSMETICI, L.; CACHOU AROMATISÉ, C. AROMATIQUE, C. DE BOLOGNA, GRAINS DE CACHOU, Fr. *Prep.* 1. Soft extract of liquorice, 3 oz.; gum catechu and white sugar, of each, 1 oz.; gum tragacanth (powdered), ½ oz.; oil of cloves, 1 dr.; oil of cassia, ½ dr.; essence of ambergris and oil of nutmeg, of each, 12 drops; make a firm mass with rose or orange-flower water, q. s., and divide it into one-grain pills; when these are dry, cover them with gold or silver leaf.

2. Solazzi juice (dried by a gentle heat and powdered), 4 oz.; lump sugar, 3 oz.; powdered catechu, 2 oz.; powdered tragacanth, 1 oz.; oil of cloves, 2 fl. drs.; oil of cassia, 1 fl. dr.; white of egg or rose water, q. s. to form a pill-mass; as before.

3. Powdered catechu, 1 oz.; Salazzi juice, 4 oz.; lump sugar, 12 oz.; oils of cloves, cassia, and peppermint, of each, 1 fl. dr.; mucilage of tragacanth, q. s. to mix; as before.

4. Extract of liquorice (soft), 2 oz.; white sugar, 3 oz.; powdered tragacanth and cascarilla (or orris root), of each, ½ oz.; oil of cloves. ½ fl. 3r.; oil of cassia, 12 drops; water, q. s. as before.

5. (Chevallier.) Powdered coffee, chocolate and sugar, of each, 1½ oz.; powdered vanilla, and freshly burnt charcoal, of each, 1 oz.; mucilage of tragacanth, q. s.

6. Chloride of lime (dry and good), 1 dr.; white sugar, 3 oz.; powdered tragacanth, 1 oz; oil of cloves, 30 drops; rose water, q. s. To disinfect the breath.

Obs. Almost every maker employs his own forms for these articles. The objects to be aimed at are the possession of rather powerful and persistent odour, and a toughness to prevent their too rapid solution in the mouth. The original Italian formula included liquorice, mastic, cascarilla, charcoal, orris root, oil of peppermint, and the tinctures of ambergris and musk, but is now seldom employed in this country. The flavour of peppermint does not, indeed, appear to be approved of by English smokers. Sometimes, instead of being made perfectly spherical, they are flattened a little.

CACHOU À L'AMBRE GRIS, CACHOU À LA CANELLE, CACHOU À LA FLEURS D'ORANGE, CACHOU MUSQUÉ, CACHOU À LA ROSE, CACHOU À LA VANILLE, CACHOU À LA VIOLETTE, &c., are merely flavoured and scented respectively with the essences or oils of ambergris, cinnamon, neroli, musk, rose, vanilla, violets, &c. See BREATH, CACHOU AROMATISÉ, LOZENGES, PILLS, &c.

PA''STRY. Articles of food made of 'paste' or dough, or of which 'paste' forms a principal and characteristic ingredient. The word is popularly restricted to those which contain puff paste, or such as form the staple production of the modern pastrycook; but it is, in reality, of much more general signification. Several varieties of paste are prepared for different purposes, of which the following are the principal:—

PUFF PASTE. The production of a first class puff paste is commonly regarded as a matter of considerable difficulty, but by the exercise of the proper precautions it is, on the contrary, an extremely simple affair. This paste, before being placed in the oven, consists of alternate laminæ of butter or fat and ordinary flour dough, the latter being, of course, the thicker of the two. During the process of baking, the elastic vapour disengaged, being in part restrained from flying off by the buttered surfaces of the dough, diffuses itself between these laminæ, and causes the mass to swell up, and to form an assemblage of thin membranes or flakes, each of which is more or less separated from the other. Individually, these flakes resemble those of an ordinary rich unleavened dough when baked; but, collectively, they form a very light crust, possessing an extremely inviting appearance and an agreeable flavour.

The precautions above referred to are—the use of perfectly dry flour, and its conversion into dough with a light hand, avoiding unnecessarily working it,—the use of butter free from water or buttermilk, and which has been reduced to precisely the same degree of plasticity as the dough between which it is to be rolled,—conducting the operation in a cool apartment, and, after the second or third folding of the dough, exposing it to a rather low temperature before proceeding further with the process; and, lastly,—baking the paste in a moderately smart but not too hot an oven. The following are examples:—

1. (Rich.) Take of flour, 1 lb.; butter, ¼ lb.; cold spring water, q. s.; make a moderately soft flexible dough, then roll in (as described above) of dry fresh butter, ¾ lb.

2. (Ordinary.) Take of flour, 1 lb.; cold water, q. s.; make a dough, and roll in, as before, of butter, 6 oz.

3. (Rundell.) Take ¼ peck of flour, rub into it 1 lb. of butter, and make a 'light paste' with cold water, just stiff enough to work well; next lay it out about as thick as a crown-piece; put a layer of butter all over it, sprinkle on a little flour, double it up, and roll it out again; by repeating this with fresh layers of butter three or four times, or oftener, a very light paste will be formed. Bake it in a moderately quick oven.

4. (Soyer.) Put 1 lb. of flour upon your pastry slab, make a hole in the centre, into which put a teaspoonful of salt, mix it with cold water into a softish flexible paste with the right hand, dry it off a little with flour until you have well cleared the paste from the slab, but do not work it more than you can possibly help; let it remain for 2 or 3 minutes upon the slab, then take 1 lb. of fresh butter from which you have squeezed all the buttermilk in a cloth, and brought to the same con-

sistency as the paste, upon which place it; press it out flat with the hand, then fold over the edges of the paste so as to hide the butter, and reduce it with the rolling-pin to the thickness of about ½ an inch, when it will be about two feet in length; fold over one third, over which again pass the rolling-pin; then fold over the other third, thus forming a square; place it with the ends top and bottom before you, shaking a little flour both under and over, and repeat the rolls and turns twice again as before; flour a 'baking-sheet,' upon which lay it, on ice, if handy, or otherwise, in some cool place, for about half an hour; then roll it twice more, turning it as before, and again place it upon ice or in the cold for ½ an hour; next give it two more rolls, making seven in all, and it is ready for use. "You must continually add enough flour while rolling to prevent your paste sticking to the slab."

HALF-PUFF PASTE. As the preceding, using only one half the quantity of butter, and giving the paste only 3 or 4 folds.

SHORT PASTE, SHORT CRUST.—1. Flour (dry and warm), 1 lb.; sugar, 3 oz.; butter, ½ lb.; 2 eggs; water, ½ pint; make a light dough. If one half of 'Jones's patent flour, be used, no eggs will be required.

2. (Soyer.) Put on the 'paste slab' or 'pie board' 1 lb. of flour, 2 oz. of pounded sugar, 6 oz. of butter, 1 egg, ½ teaspoonful of salt, and ½ pint of water; mix the sugar and butter well together, add them with the water by degrees to the flour, and form a paste, but firmer than puff paste.

PIE PASTE. That commonly used is 'short paste,' varied at will; but at good tables the upper crust of the pie is generally made of 'puff paste,' and the remainder of 'short paste.'

PUDDING PASTE. This, for baked puddings, may resemble the last. For boiled puddings (or indeed for any), the paste may be either ordinary 'short paste,' or one made with 2 to 6 oz. of butter or lard, or 3 to 8 oz. of chopped beef suet, to each lb. of flour, with or without an egg, and a little sugar, according to the means of the parties. The first is most appropriate for those containing fresh fruit, and that with suet for meat puddings, and those containing dried fruit, as grocer's currants, plums, &c. Milk or milk-and-water is often used instead of simple water to make the dough. Ginger, spices, savory herbs, &c., are common additions to the crusts of puddings. Where economy is an object, and especiallly among the lower classes, kitchen fat is frequently substituted for suet, and lard for butter. When 'Jones's patent flour' is employed, an excellent plain pudding paste may be made by simply mixing it up with very cold water, and immediately putting it into the water, which should be boiling, and kept in that state until the pudding is dressed.

PA'TENT MED'ICINES. *Syn.* MEDICAMENTA ARCANA, L. The majority of the preparations noticed under this head are the nostrums popularly termed 'quack medicines,' and which are sold with a Government stamp attached to them. A few other secret or proprietary remedies are also, for convenience, included in the list. An alphabetical arrangement, based on the names of the reputed inventors or proprietors of the articles, has been adopted, as being the one best suited for easy reference. The composition of a number of them is given from careful personal inspection and analysis (by Mr. Cooley), and that of the remainder on the authority of Gray, Griffith, Paris, Redwood, the members of the Philadelphia College of Pharmacy, and other respectable writers. A variety of articles not included in the following list are noticed along with other preparations of the class to which they belong, or under the names of their proprietors. See BALSAM, CERATE, DROPS, ESSENCE, TINCTURE, OINTMENT, PILLS, &c.

Abernethy's Pills. See ABERNETHY MEDICINES (page 4).

Albinolo's Ointment. See HOLLOWAY'S OINTMENT (*below*).

Ali Ahmed's Treasures of the Desert. There are three preparations included under this name:—

a. (ANTISEPTIC MALAGMA.) From lead plaster, 3 parts; gum thus and salad oil, of each, 2 parts; bees' wax, 1 part; melted together by a gentle heat, and spread upon calico.

b. (PECTORAL, ANTIPHTHISIS, or COUGH PILLS.) From myrrh, 3½ lbs.; squills and ipecacuanha, of each, 1 lb.; (all in powder;) white soft soap, 10 oz.; oil of aniseed, 1½ oz.; treacle, q. s. to form a pill mass.

c. (SPHAIROPEPTIC or ANTIBILIOUS PILLS.) From aloes, 28 lbs.; colocynth pulp, 12 lbs.; rhubarb, 7 lbs.; myrrh and scammony, of each, 3½ lbs.; ipecacuanha, 3 lbs.; cardamom seeds, 2 lbs.; (all in powder;) soft soap, 9 lbs.; oil of juniper, 7 fl. oz.; treacle, q. s. This, as well as the last, is divided into 3½-gr. pills, which are then covered with tin foil or silver leaf. An excellent aperient pill, no doubt, and one likely to prove useful in all those cases in which the administration of a mild diaphoretic and stomachic purge is indicated. Unlike many of the advertised nostrums of the day, there is nothing in their composition that can, by any possibility, prove injurious; but beyond this they are destitute of virtue.

Anderson's Scot's Piils. See PILLS.

Atkinson's Infant Preservative. From carbonate of magnesia, 6 drs.; white sugar, 2 oz.; oil of aniseed, 20 drops; spirit of sal volatile, 2½ drs.; laudanum, 1 dr.; syrup of saffron, 1 oz,; caraway water to make up 1 pint.

Balm of Rackasiri. See BALSAM (page 262).

Balsam of Life. *Syn.* BAUME DE VIE, Fr. Several compound medicines of this name are noticed on page 261. The following are well-known nostrums:—

1. (Hoffman's)—*a.* Of the oils of cinnamon, cloves, lemon, lavender, and nutmegs, and bal-

sam of Peru, of each, 2 drs.; essence of ambergris, oil of amber, and oil of rue, of each, 1 dr.; cochineal, 12 grs.; strongest rectified spirit, 3½ pints; mix.

b. (Ph. Dan. 1840.) Oils of cinnamon, cloves, lavender, and nutmegs, of each, 20 grs.; purified oil of amber, 10 drops; balsam of Peru, 30 grs.; rectified spirit (tinged with alkanet root), 10 oz.

2. (Gabius's.) Nearly similar to Hoffmann's.

3. (Turlington's.) Benzoin and liquid styrax, of each, 12 oz.; balsam of tolu and extract of liquorice, of each, 4 oz.; balsam of Peru, 2 oz.; aloes, myrrh, and angelica root, of each, 1 oz.; highly rectified spirit of wine, 7 pints; digest, with frequent agitation for 10 days, and filter. Externally, the above are rubefacient and corroborant; internally, stimulant, cordial, and pectoral.

Betton's British Oil. From oil of turpentine, 1 pint; Barbadoes tar, ¼ lb.; oil of rosemary, 1 fl. oz.

Blake's Green-mountain Ointment. We are told that the active ingredient in this compound is *Arnica montana*, with a basis of soap cerate. It is very useful as an external application in several affections. The chief objection to its use is that it is a secret preparation.

Blake's Toothache Essence. From alum, in fine powder, 1 dr.; sweet spirit of nitre, 5 dr.

Boerhaave's Odontalgic Essence. From opium, ½ dr.; oil of cloves, 2 dr.; powdered camphor, 5 dr.; rectified spirit, 1½ fl. oz.

Bouchardat's Tasteless Aperient. From phosphate of soda, ¾ oz., placed in a soda-water bottle, which is then filled up with carbonated water, at the bottling machine. For a dose.

Brande's Tooth Tincture. From pellitory of Spain (bruised), 1 oz.; camphor, ¾ oz.; opium, ¼ oz.; oil of cloves, 1 dr.; digested for 10 days in rectified spirit, ½ pint.

Brodum's Nervous Cordial. *Prep.* 1. "Originally it consisted simply of an infusion of gentian root in English gin, coloured and flavoured with a little red lavender (compound spirit of lavender). After a time the doctor added a little bark to the nostrum, and subsequently made other additions." ('Anat. of Quackery.')

2. (Paris.) Tinctures of gentian, calumba, cardamoms, and cinchona, compound spirits of lavender, and steel wine, of each, equal parts. "It is tonic, stomachic, and stimulant; but, beyond these, possesses no curative properties." ('Anat. of Quackery.')

Chlorodyne. This nostrum, which was first introduced as "a combination of perchloric acid with a new alkaloid," has become a popular anodyne and sedative. Several preparations are sold under this name, and the claims of the rival makers have occasioned some expensive lawsuits. The name was undoubtedly invented by Dr. J. Collis Browne, but Mr. Freeman, pharmaceutical chemist, claims to be the inventor of the preparation. Whether Browne's and Freeman's 'chlorodynes' are essentially the same, we are not able to determine, but we know that there is not the slightest foundation for the statements made by each manufacturer respecting the new vegetable principle contained in his medicine. Chlorodyne, in every one of its forms, is simply a mixture of certain well-known materials, some of which are rather dangerous ingredients for a popular nostrum. According to the analysis of Dr. Ogden, Browne's chlorodyne is composed as follows:—

Chloroform, 6 drs.; chloric ether, 1 dr.; tincture of capsicum, ¼ dr.; oil of peppermint, 2 drops; hydrochlorate of morphine, 8 grs.; Scheele's hydrocyanic acid, 12 drops; perchloric acid, 20 drops; tincture of Indian hemp, 1 dr.; treacle, 1 dr. 'Towle's chlorodyne' is prepared according to this formula, the ingredients being named on the label.

Clarke's Conglutinnm. (See page 362.)

Cochrane's Cough Remedy. Acidulated syrup of poppies.

Corn Nostrums. (See page 371.)

Cottereau's Odontalgic Essence. A nearly saturated ethereal solution of camphor, mixed with about $\frac{1}{12}$th of its volume of strong liquor of ammonia,

Curtis's Anti-venereal Lotion. A mixture of Beaufoy's solution of chloride of lime, 2 fl. oz., with cold soft water, 8 fl. oz. For *use*, 1 to 2 table-spoonfuls are put into a wine-glassful of water.

Dalby's Carminative. 1. (Dr. Paris.) Carbonate of magnesia, 40 grs.; tincture of castor and compound tincture of cardamoms, of each, 30 drops; tincture of asafœtida and spirit of pennyroyal, of each, 15 drops; laudanum, 5 drops; oil of aniseed, 3 drops; oil of nutmeg, 2 drops; oil of peppermint, 1 drop; peppermint water, 2 fl. oz.—*Dose.* ¼ to 1 teaspoonful. The bottle should be well shaken before pouring it out.

2. (Wholesale.) Carbonate of magnesia, 1 oz.; tincture of castor, 5 fl. dr.; tincture of asafœtida, 3 fl. drs.; oils of aniseed and pennyroyal, of each, ¼ fl. dr.; oil of nutmeg, 15 drops; syrup of poppies, 7 oz.; rectified spirit. 3½ fl. oz.; peppermint wrter, ½ pint; as before.

Davidson's Cancer Remedy. A mixture of arsenious acid and hemlock, both in powder. (Dr. Paris.)

Davis's Calorific. The 'LIQUID' is commercial acetic acid (sp. gr. 1·048), diluted with about an equal voluue of water, and coloured with burnt sugar or spirit colouring. The 'SHIELD' consists of a piece of red flannel backed with oil skin, to prevent evaporation. A few drops of calorific are sprinkled on the flannel, which is then bound over the affected part. The heat of the body gradually volatilises the acetic acid, and the escape of the vapour being prevented by the oil skin, a strongly counter-irritant action is set up.

Derbyshire's Embrocation. From opium and mottled soap, of each, 2 oz.; extract of henbane, 2 drs.; and mace, ½ dr.; boiled for 30 minutes in water, 3 pints; to the cold liquor, rectified spirit, 1 quart, and liquor of ammonia, 1 fl. oz., are added, and, after repose, the clear portion is decanted. A preventive of sea-sickness.

Deshler's Cerate. Yellow basilicon. (See page 417.)

Duncan's Gout Medicine. See GOUT.

Dutch Ague Remedy. A mixture formed of Peruvian bark and cream of tartar, of each, 1 oz.; cloves, ½ dr.; reduced to fine powder. —*Dose.* 1½ dr., every 3 hours. (Dr. Paris.)

Godfrey's Cordial. 1. (Original formula.) Opium (sliced), ½ oz.; sassafras chips, 1 oz.; English brandy, 1 quart; macerate for 4 or 5 days, then add, of water, 1 quart, treacle, 3½ lbs., and simmer the whole gently for a few minutes; the next day decant the clear portion.

2. (Dr. Paris.) Aniseed, caraways, and corianders, of each, bruised, 1 oz.; sassafras chips, 9 oz.; water, 6 pints; simmer gently until reduced to 4 pints, then add of treacle, 6 lbs.; and when nearly cold, further add of tincture of opium, 3 fl. oz.

3. (Phil. Col. of Phar.) Carbonate of potassa, 2¼ oz.; water, 26 pints (old wine measure); dissolve, add of sugar-house molasses (treacle). 16 pints (o. w. m.); simmer the mixture, remove the scum, and when it has considerably cooled, add, of tincture of opium, 24 fl. oz.; oil of sassafras, ½ fl. oz.; (dissolved in) rectified spirit, 1 quart (o. w. m.). It contains about 16 drops of laudanum (= 1⅓ gr. of opium) in each fl. oz.

The following forms are also current in the wholesale trade:—

4. From molasses, 16 lbs.; distilled water, 2¾ galls.; oil of sassafras, 1 fl. oz., (dissolved in) rectified spirit, ½ gall.; bruised ginger, ¾ oz.; cloves, ½ oz.; laudanum, 8 fl. oz.; macerate for 14 days, and strain through flannel.

5. Sassafras chips, 1 lb.; ginger (bruised), 4 oz.; water, 3 galls.; simmer until reduced to 2 galls.; then add, of treacle, 16 lbs.; rectified spirit, 7 lbs.; laudanum, 1 pint.

6. Opium, ½ oz.; treacle, 7 lbs.; boiling water, 1 gall.; dissolve, and add, of rectified spirit, 1 quart; oil of sassafras, ½ dr.; cloves and mustard seed, of each, ½ oz.; coriander and caraway seeds, of each, 1 dr.; digest for a week.

7. Caraways, corianders, and aniseed, of each, 1 lb.; water, 6 galls.; distil 5 galls., and add, of treacle, 28 lbs.; laudanum, 1 quart; and oil of sassafras, 1 fl. oz., previously dissolved in rectified spirit, 1 gal.

Obs. This preparation is anodyne and narcotic, and, amongst the lower classes, is commonly given to children troubled with wind or colic. Its frequent and excessive use has sent many infants prematurely to the grave. *Gray says,* "It is chiefly used to prevent the crying of children in pain or starving." The dose is ⅓ teaspoonful and upwards, according to the age and susceptibility of the child.

Graves' Gout Preventive. A tincture prepared by steeping, for a week, dried orange peel and hiera picra, of each, 1 oz., and rhubarb, ½ oz., in brandy, 1 pint.

Grinrod's Remedy for Spasms. From acetate of morphia, 1 gr.; spirit of sal volatile and sulphuric ether, of each, 1 fl. oz.; camphor julep, 4 fl. oz.; for a mixture. It should be kept closely corked, in a cool place, and should be well shaken before use.—*Dose.* A teaspoonful in a glassful of cold water or wine, as required. It is a really valuable preparation.

Herrendschwand's Specific. A mixture of gamboge, 10 grs., with carbonate of potassa, 20 grs. (Dr. Paris.)

Holloway's Ointment. The original formula of ALBINOLO'S OINTMENT, of which this pretends to be a reproduction, contains the "graisses de serpent et de vipère," and other pharmaceutical curiosities. The principal ingredients, however, in the HOLLOWAY'S OINTMENT of the present day are very homely substances. In the case of Sillen *v.* Holloway, tried at the Court of Common Pleas in January, 1863, the plaintiff's council asserted that, on the ointment being received by the agent in Paris, it was submitted to the authorised government chemists to be analysed, in accordance with the law of France prohibiting the sale of secret remedies, and was found by them to contain butter, lard, Venice turpentine, white wax, yellow wax, and nothing else. In a letter to the 'Times,' Professor Holloway stated that the French analysis was incorrect, for three of the ingredients named were not in the ointment, while there were other components which the analysis had not discovered. The formula adopted by those who prepare an imitation ointment on the large scale, and which closely resembles, if it be not actually identical with, that employed by Mr. Holloway, is as follows:—Fresh butter (free from water), ¾ lb.; bees' wax (good), 4 oz.; yellow resin, 3 oz.; melt them together, add of vinegar of cantharides, 1 fl. oz., and simmer the whole, with constant agitation, for 10 or 12 minutes, or until the moisture is nearly evaporated; then add, of Canada balsam, 1 oz.; expressed oil of mace, ½ dr.; balsam of Peru or liquid styrax, 10 or 12 drops; again stir well, allow the mixture to settle, and when it is about half cold (not before) pour it into the pots, previously slightly warmed, and allow it to cool very slowly. The label will do the rest. No two samples of Holloway's ointment are precisely of the same colour or consistence.

Holloway's Pills. From aloes, 4 parts; jalap, ginger, and myrrh, of each, 2 parts; made into a mass with mucilage. and divided into 2-grain pills, of which about 4 dozen are put into each 1*s.* 1½*d.* box.

Jackson's Bathing Spirit. A species of soap liniment, made of soft soap, 1 lb.; camphor, 6 oz.; oils of rosemary and thyme, of each ¾ fl. oz.; rectified spirit, 1 gal.

Kaye's Infant's Preservative. A preparation partaking of the joint properties of Atkinson's nostrum and Godfrey's cordial, but more powerful than either, as indicated by the doses in which it is directed to be given during early infancy, viz., "two, three, or more drops."

Keating's Cough Lozenges. These are said to be composed of—Lactucarium, 2 drs.; ipecacuanha, 1 dr.; squills, ¾ dr.; extract of liquorice, 2 oz.; sugar, 6 oz.; made into a mass with mucilage of tragacanth, and divided into 20-gr. lozenges.

King's Sarsaparilla Pills. From the compound extract. "Instead of two pills being equivalent to ½ fl. oz. of the concentrated decoction or essence of sarsaparilla, as asserted, it takes about 32 of them to represent the given quantity, and about 4 of them to be equal in strength to the common decoction of the Pharmacopœia." "Instead of one 2*s.* 9*d.* box of these pills being equal to a pint of the costly concentrated fluid preparation, it would take nearly 1½ lb. of them for that purpose." ('Med. Circ.,' ii, 493.)

Kitchener's Peristaltic Persuaders. See PILLS.

Lambert's Asthmatic Balsam. The active ingredients in this compound are said to be squills and aqueous extract of opium.

Lemazurier's Odontalgic Essence. From acetate of morphia, 1 gr.; dissolved in cherry-laurel water, 1 oz. For use, a teaspoonful is added to ½ a wine-glassful of warm water, and the mouth well rinsed out with the mixture.

Leroy's Purgative.—*a.* (No. 1.) Vegetable turbith, 6 drs.; scammony, 1½ oz.; jalap, 6 oz.; brandy, 10 pints; digest for 24 hours, and add a syrup made of senna, 6 oz.; water, 1¼ pint; sugar, 32 oz.

b. (No. 2.) As the last, only 1-3rd stronger.

c. (No. 3.) Twice as strong as No. 1.

Lewis's Electuarium. A liquid nostrum, said to be alterative and to contain a small quantity of both antimony and mercury.

Lewis's Baslamic Ointment. This preparation, which is declared by its proprietor to be "utterly unsurpassable," for the most part resembles Holloway's ointment. ('Med. Circ.,' ii, 493.)

Lewis's Silver Cream. This nostrum is said to depend for its efficacy on white precipitate and a salt of lead. .

Locock's Pulmonic Lozenges. See WAFERS.

Mahomed's Paste. See ELECTUARY.

Mardant's Norton's Drops. A mixture of the tinctures of gentian and ginger, holding in solution a little bichloride of mercury, and coloured with cochineal.

Marriott's Dry Vomit. A mixture of equal parts of tartar emetic and sulphate of copper.

Marsden's Drops. A coloured solution of corrosive sublimate. (Dr. Paris.)

Matthieu's Vermifuge.—*a.* (To destroy the worms.) Tin filings, 1 oz.; male fern root, 6 drs.; worm seed, 4 drs.; resinous extract of jalap and sulphate of potassa, of each, 1 dr.; honey, q. s. to form an electuary.—*Dose.* A teaspoonful, repeated every third or fourth hour, for 2 or 3 days, when the following is to be substituted, and continued until the bowels are well acted on.

b. (To expel the worms.) Jalap and sulphate of potassa, of each, 40 grs.; scammony, 20 grs.; gamboge, 10 grs.; honey, q. s. as before.

McKinsey's Golden Cerate. This appears to resemble Poor Man's Friend.

McKinsey's Katapotia. This notorious nostrum is compounded of aloes, 5 oz.; soap, 1½ oz.; (both in powder;) beaten up with syrup of saffron and a little essential oil, and divided into pills varying in weight from 2 to 2½ grs. each. ('Med. Circ.,' iv, 86.)

McKinsey's Medicinal Powder. *Syn.* REV. T. SMITH'S M. P. From dried lavender flowers and rosemary tops, of each, 2½ oz.; asarabacca, 1 oz.; reduced to powder, and further disguised with a little perfume. A very small quantity of subsulphate of mercury is also most probably added. Two or three pinches of this powder, taken 3 or 4 times a day, as snuff, is said by the proprietor to be sufficient to cure almost every known disease. See ASARABACCA.

Morison's Aperient Powder. A mixture of cream of tartar and lump sugar, in nearly equal proportions, with sufficient powdered cassia to give it an aromatic flavour. See PILLS.

Morrison's Adhesive Paste. See PLASTER.

Ollivier's Biscuits. Take of the white of 2 eggs; water, ¾ pint; beat them together, strain the mixture, and add to it a solution of bichloride of mercury, 76 grs.; collect the precipitate, wash, dry, powder, and carefully weigh it; next add it to such a quantity of flour &c., that each 2-dr. biscuit may contain exactly 1/7 gr.

Papier Fayard. See PAPER (Gout).

Pate Arsenicale. A powder composed of arsenious acid, 8 grs.; dragon's blood, 22 grs.; cinnabar, 70 grs. It is to be made into a paste with the saliva at the time of applying it. A favorite remedy in cancer on the Continent. (Dr. Paris.)

Perry's Balm of Syriacum. From English gin, 1 pint; moist sugar, ½ lb.; (dissolved in) water, 4 oz.; mix, and add of paregoric (Tinct. Camph. Co.—Ph. L. 1836), 1 oz. tincture of tolu, ½ oz.; tincture of cantharides, q. s.; together with a few drops each of the oils of aniseed and spearmint; agitate well together, and the next day filter, or decant the clear portion.

Perry's Preventive Lotion. This is said to be a solution of sal alembroth, 2 drs., in water, 1 pint. For use, it is diluted with 4 or 5 times its bulk of water.

Pieste's Toothache Essence. From liquor of ammonia, 2 parts; laudanum, 1 part. It is applied on lint.

Pilules Angéliques. *Syn.* GRAINS DE SANTÉ. Take of aloes and juice of roses, of each, 4 oz.; juices of borage and chicory, of each, 2 oz.; beat them together, and when they are reduced to the consistence of a soft pill-mass, add of powdered rhubarb, 2 drs., powdered agaric, 1 dr., and divide the mixture into 1½-gr. pills. A good purgative. *Dose.* 4 to 12.

Poor-man's Friend (French). See OINTMENT (Brown).

Poor-man's Friend (Dr. Roberts'). This consists chiefly of ointment of nitric-oxide of mercury.

Pringle's Remedy for Typhus. (Dr. Paris.) Pale cinchona (bruised), ½ oz.; water, 12 fl. oz.; boil them together for 10 minutes, adding, towards the end, Virginian snake-root (bruised), 2 drs.; macerate for an hour in a covered vessel, and to the strained liquid add of dilute sulphuric acid, 2 fl. drs., and when the mixture is cold, further add of spirit of cinnamon, 1 fl. oz. The dose is 2 table-spoonfuls every six hours.

Reynold's Gout Specific. Wine of colchicum disguised by some unimportant additions.

Righini's Odontalgic Drops. A solution of creasote in an equal weight of the strongest rectified spirit, coloured with cochineal, and disguised by the addition of a few drops of oil of peppermint.

Ruspini's Styptic. A strong solution of gallic acid in spirit of roses. Dr. A. T. Thomson says that it also contains sulphate of zinc.

Rust's Toothache Paste. See PASTE.

Scott's Drops. *Syn.* TINCTURE OF SOOT. From wood-soot, 2 oz.; assafœtida, 1 oz.; brandy or proof spirit, 1 pint. *Dose.* 1 to 2 table-spoonfuls; in hysteria, &c.

Smith's Powder. See MC.KINSEY'S POWDER.

Solomon's Anti-impetigines. A solution of bichloride of mercury disguised by the addition of a little flavouring and tinctorial matter. ('Med. Circ.,' ii, 69, 70.)

Standert's Red Mixture. Take of carbonate of magnesia, 1 oz.; powdered Turkey rhubarb, ½ oz.; tincture of rhubarb, 3 fl. oz.; tincture of opium, 2 fl. drs.; oils of aniseed and peppermint, of each, ½ dr.; (dissolved in) gin or proof spirit, 5 fl. oz.; agitate the whole together, then further add of soft water, 1½ pint. In colic and diarrhœa. *Dose.* A wine-glassful. The spirit is frequently omitted, but then the mixture soon spoils.

Standart's Stomachic Candy. Take of lump sugar, 1 lb.; water, 3 fl. oz.; dissolve by heat; add cardomom seeds, ginger, and rhubarb, of each, 1 oz.; and when the mixture is complete, pour it out on an oiled slab or into moulds.

Storey's Worm Cakes. Take of calomel and cinnabar of each, 24 grs.; powdered jalap, 72 g s.; ginger, 1 dr.; white sugar, 1½ oz.; syrup, q. s.; mix and divide into a dozen cakes. Resemble 'Ching's lozenges' in their action. (See page 719).

Struve's Lotion. See HOOPING-COUGH LOTION (page 715).

Succession Powder. A mixture of powdered quartz and diamond dust, chiefly the first. *Used* as an escharotic.

Tasteless Ague Drops. A solution of arsenite of potassia. It is the common ague medicine in the fen counties of England.

Turlington's Balsam. See BALSAM OF LIFE (*above*).

Valangin's Solution of Solvent Mineral. From arsenious acid, ½ dr., dissolved in hydrochloric acid, 1½ dr., and the solution diluted with distilled water, 1½ pint. In ague, &c. It has rather less than half the strength of the solution of arsenite of potassa, Ph. L.

Vance's Cream. See CHILBLAIN.

Wahler's Ointment. See CHILBLAIN.

Ward's Purging Powder. A mixture of jalap and cream of tartar, equal parts, coloured with a little red bole. *Dose.* A teaspoonful, or more, in broth or beer, twice or thrice daily; in dropsy.

Webster's Diet Drink. A sweetened decoction of betony, dulcamara, guaiacum wood, liquorice root, sarsaparilla, sassafras, thyme, and turmeric.

Wilson's Gout Tincture. This is said to be wine of colchicum.

Wright's Pearl Ointment. Take of white precipitate, 8 oz.; Goulard's extract, 1 pint; rub them to a cream, and add the mixture to white wax, 7 lb., and olive oil, 10 lb., previously melted together by a gentle heat; lastly, stir the whole until it is nearly cold. ('Pharm. Journ.')

Young's Aperient Drink. From carbonate of soda, 2½ drs.; bitartrate of potassa, 3 drs.; (both in crystals;) throw them into a soda-water bottle containing cold water, 8 fl. oz., and immediately cork it down securely, and keep it inverted, in a cool place, until required for use.

Zanhetti's Bohemian Restorative Tincture. From crushed raisins, ¾ lb.; hay saffron, 2 oz.; aqueous extract of opium, 3 drs.; powdered cochineal, 2 drs.; capillaire and orange-flower water, of each, ½ pint; proof spirit, 3 pints; digested together for a week, and then strained, with expression.

PAULLIN'IA. See GUARANA.

PAYN'IZING. The name given to Mr. Payne's process for preserving and mineralising wood. See DRY-ROT.

PEACH. *Syn.* PERSICUM, L. The fruit of *Amygdalus Persica.* Two varieties are known in our gardens — CLINGSTONE PEACH and FREESTONE PEACH, terms which explain themselves. The fruit is wholesome; but the flowers and kernels contain prussic acid, and are poisonous.

PEACH'WOOD. The produce of a species of *Cæsalpinia*, now extensively used in calico-printing.

PEAR. *Syn.* PYRUS, L. The fruit of *Pyrus communis* (Linn.), one of the rosaceæ. Its general qualities resemble those of the apple.

PEAR FLAVOUR. See ESSENCE.

PEARL. *Syn.* MARGARITA, MARGARITUM, PERLA, UNIO, L. The most beautiful and costly pearls are obtained exclusively from the pearl oyster (*Meleagrina margaritifera*) of the Indian Seas. The principal fisheries are on the coast of Ceylon, and at Olmutz, in the Persian Gulf. An inferior description of pearl is procured from a fresh-water shell-fish (*Unio margaritifera*) in the neighbourhood of Omagh, county of Tyrone. A similar quality is also procured from the river Ythan, Aberdeenshire. It is probable that pearls from this source, collected by the ancient Britons, may have given rise to the statement by Tacitus, in his Life of Agricola, of pearls "not very orient, but pale and wan," being among the indigenous products of Great Britain.

Pearls are composed of membrane and carbonate of calcium; or, in other words, of substances similar to bladder and chalk, in alternate layers.

The cause of the production of pearls is highly curious and interesting. When any foreign body gains a permanent lodgment within the shells of any of the mollusca which are lined with pearly matter, or nacre, the pearly secretion of the animal, instead of being spread in layers on the inside of its habitation, is accumulated around the offending particles in concentric films of extreme tenuity, and more or less spherical, forming a pearl.

Pearls were formerly used in medicine as absorbents or antacids; and among the ancients they were occasionally taken, dissolved in acid, both as a remedy and for the purpose of displaying the careless opulence and luxury of their possessors. A perfect pearl, large, truly spherical, highly iridescent, and reflecting and decomposing the rays of light with vivacity, claims to rank with the most costly of the gems, and in some parts of the East is, with justice, more highly prized than even the diamond. In Europe, however, the present estimation of their value is somewhat different. "A handsome necklace of Ceylon pearls, smaller than a large pea, costs from £170 to £300; but one of pearls about the size of peppercorns may be had for £15. The pearls in the former sell at a guinea each, and those in the latter at about 1s. 6d." (Milburn.) Seed pearls are of little value, however beautiful.

Pearl, Artificial. These are hollow spheres or beads of glass, perforated with two holes at opposite sides to permit of their being strung into necklaces. A small portion of essence d'orient is introduced into each, by suction, and is then spread over the inner surface of the glass. When this has become dry and hard, the globe is filled up with white wax, spermaceti, or gum arabic. The glass of which the beads are formed is slightly bluish and opalescent, and very thin. The latest improvement consists in removing the glassy appearance of the surface of the prepared bead, by exposure to the fumes of hydrofluoric acid, highly diluted.

Pearl, Mother of. *Syn.* UNIONUM CONCHÆ, L.; NACRE DE PERLE, Fr. This is the internal or nacreous layer of those shells which produce the pearls for ornamenting the person; hence the term 'mother of pearl' is by no means inappropriate. It is also derived from several other species, known in trade as ear-shells, green snail-shells, Bombay-shells, &c.

The brilliant hues of mother of pearl do not depend so much upon the nature of the substance as on its structure. Its surface is covered by minute corrugations or furrows, which give a chromatic appearance to the reflected light. Sir David Brewster was the first to show that this substance is capable of imparting its iridescent appearance to fusible metal or fine black wax.

Mother of pearl is cut and wrought with nearly similar tools to those used for ivory, but its treatment, owing to its more fragile nature and delicate structure, requires considerably greater care. It is polished with colcothar or putty powder.

The numerous applications of mother of pearl, for buttons and knife-handles, boxes, inlaying work, &c., are well known.

PEARL'ASH. This is prepared by calcining the crude potashes on a reverberatory hearth, dissolving the calcined mass in water, and, after repose, decanting the clear solution, and evaporating it to dryness in flat iron pans, the product being constantly stirred towards the end to reduce it to a semi-granular state. Although purer, its richness in absolute alkali is less than that of the potashes from which it is prepared, being only from 47 to 51%. This exists almost entirely under the form of carbonate. The commercial value of this substance is determined by the ordinary processes of ALKALIMETRY.

PEARL BARLEY. See BARLEY.

PEARLS (Rose). *Syn.* ROSE BEADS. The petals of red roses beaten in an iron mortar for some hours, until they form a smooth, black paste, then rolled into beads and dried. Hard; very fragrant; take a fine polish.

PEARL WHITE. This is subchloride of bismuth; but the name is now commonly applied to trisnitrate of bismuth, which is sold for it.

PEAS. *Syn.* GARDEN PEAS, MOTOR P.; PISA, L. The seed of *Pisum sativum* (Linn.). Poggiale found in 100 parts of common green peas, dried and shelled, 57 of starch, 21·7 of a nitrogenous substance (legumin), 1·9 of fatty matter, 3·2 of cellulose, 2·8 of ash, and 12·7 of water. In the fresh state (GREEN PEAS) they are nutritive, and, with the pods which contain them, are highly serviceable in scurvy. The last have been used for making beer. The dried seeds are still more nutritious, but are heavy and flatulent unless well cooked. For kitchen use, 'SPLIT PEAS' should be chosen, and after having washed them in a little clean soft water, and allowed them to drain, they should be left to soak in cold soft water for at least 12 hours before applying heat to them, and should then be dressed in the same water in which they have been soaked, and be only gently simmered until they are reduced to a pulp. Additions of meat, vegetables, &c., should not be made until they have nearly arrived at this condition. 'WHOLE PEAS' require soaking for at least 18 or 20 hours.

A substitute for green peas in winter may be obtained by placing the dried seed on a flat dish, sprinkling them with water, and keeping them in a warm situation. In a few days germination commences, and, after it has proceeded sufficiently far, the whole is dressed in the usual manner. An easier and simpler plan is to preserve the green peas, when they are in season, by the common method adopted for gooseberries and other like fruit.

Peas, Is'sue. *Syn.* PISA PRO FONTICULIS, L. Orange berries, or the small unripe fruit of the orange tree, dried, and smoothed in a lathe. See ISSUE.

PEB'BLE. The trade name for the transparent colourless variety of rock crystal or quartz used for the lenses of spectacles instead of glass, over which, from its extreme hardness, it has the advantage of being little apt to be scratched.

PEC'TIC ACID. The name given by Braconnot to an acid which is found very generally diffused throughout the vegetable kingdom, and analogous to jelly.

Prep. From carrot roots, from which the juice has been pressed out, by boiling them with $\frac{1}{25}$th part of their weight of carbonate of potassa, and about 6 times their weight of water, until the liquid becomes gelatinous when neutralised with an acid. A pectate of potassium is formed, from which the acid may be obtained by neutralising the alkali with a stronger acid, or by carefully adding a solution of chloride of calcium as long as a gelatinous precipitate (pectate of calcium) falls, and, after washing this with water, decomposing it with dilute hydrochloric acid.

Prop., &c. A colourless jelly, having an acid reaction; scarcely soluble in cold water, more so in hot water; and precipitated by acids, alkalies, alcohol, salts, and even sugar. Its compounds with the bases are called pectates. By long boiling with solution of caustic alkali it is converted into metapectic acid, which does not gelatinise. (See *below*.)

PEC'TIN. *Syn.* VEGETABLE JELLY. Obtained by adding alcohol to the juice of ripe currants or other fruit, until a gelatinous precipitate forms, which must be drained, washed with a little weak alcohol, and dried.

Prop., &c. In the moist state it forms a neutral, tasteless, soluble, transparent jelly; when dried, a translucent mass, closely resembling isinglass; boiled with water, or with dilute acids, it is converted into parapectin and metapectin; in the presence of alkalies, these, as well as pectin, are changed into pectic acid, and, by continuing the ebullition for some time longer, into metapectic acid, which is not gelatinous. See PECTIC ACID.

PEC'TORALS. Under this head are popularly included all the various remedies employed in breath or chest diseases.

PEDIC'ULI. Three species of these parasites infest the human body:—PEDICULUS HUMANUS CAPITIS, or HEAD LOUSE, which lives and breeds in the hair of the scalp, and does not voluntarily extend its ravages beyond it;—P. H. CORPORIS, or BODY LOUSE, which resides on the trunk of the body and the garments, and is characterised by being white and nearly immaculate; and P. PUBIS, or CRAB LOUSE (so named from the cheliform structure of its legs), found chiefly on the pubes, but if not checked, gradually extending itself to the armpits, eyebrows, and other parts covered with hair. This is the most malignant species of the three, and frequently burrows so deeply in the skin as to be with difficulty dislodged.

The presence of pediculi is, in general, an indication of dirty habits, or of contact with the dirty and lazy. Persons who perform the duties of the toilet with ordinary care, and who change their linen sufficiently often, are utter strangers to the visitations of these insects. The use of the hair-brush, strong scents, oil, soap-and-water, and the like, are incompatible with their existence. For the destruction of the *p. pubis*, a solution of from 15 to 20 grs. each of bichloride of mercury and sal ammoniac, in a pint of distilled or pure soft water, is most cleanly and effective. Weak tobacco water, decoction of stavesacre seeds or of white hellebore, and the ointments of mercury, sulphur, and white precipitate, are also frequently employed for the same purpose. See ACARI, VERMIN, &c.

PEL'LICLE. See CRYSTALLISATION.

PEL'LITORY. *Syn.* PELLITORY OF SPAIN; (PELLITORY ROOT; PYRETHRI RADIX, B.P.); PYRETHRUM (Ph. L. & E.), L. The root of *Anacyclus Pyrethrum*. It is a powerful tropical excitant. It is chiefly employed as a masticatory in headache, toothache, palsy of the tongue, and facial neuralgia and rheumatism; and, made into a tincture with rectified spirit, it is a common remedy among dentists for the toothache. Internally, it has been given as a gastric stimulant, and in intermittents, &c. ½ to 1 dr. may be chewed at a time.

PEL'TRY. The name applied to fur skins in the state in which they are received from the hunters. To prepare them as furs, the inside of them is generally first 'tawed' by the application of a solution of alum. They are next well dusted over and rubbed with hot plaster of Paris or whiting, and are, lastly, thoroughly dried and brushed clean. When it is desired to change or modify their colour, the grease being removed by lime water or a weak soda lye, they are stretched out on a table or board, and the ordinary liquid mordants and dyes are applied to them hot, by means of a painter's brush.

The furs of the rabbit and hare are rendered fit for the purposes of the felt and hat manufactures by a process called by the French '*sécretage*.' This consists in thoroughly moistening the hair with a solution of quicksilver, 1 part, in aquafortis, 16 parts, diluted with half to an equal bulk of water. This is applied with a brush, and the moistened skins being laid together, face to face, are dried as rapidly as possible in a stove room. See Furs.

PEN'CILS. This name is applied to the small brushes made of camel's hair used by artists, as well as to the plumbago crayons familiarly known as black-lead pencils. The last are prepared by one or other of the following methods:—

1. The blocks of plumbago are exposed to a bright-red heat in a closely covered crucible, and are afterwards sawn into minute sticks, and mounted in cases of cedar or satin wood.

2. The plumbago, in powder, is calcined as before, and then mixed with an equal, or any other desired proportion of pure washed clay, also in powder, after which the mixture is reduced to a plastic state with water, and pressed into grooves cut on the face of a smooth board, or into well-greased wooden moulds, in which state it is left to dry. When dry, the pieces are tempered to any degree of hardness by exposing them, surrounded by sand or powdered charcoal, in a closely covered crucible, to various degrees of heat. The crucible is not opened until the whole has become cold, when the prepared 'slips' are removed and mounted as before. This method was invented by M. Conté, in 1795.

3. The dough or paste, prepared as last, is reduced to the required form by forcing it through a perforated plate (in a similar manner to that adopted for coloured crayons), or into minute metallic cylinders, from which it may be readily shaken after it has become partially dry.

Obs. The leads for some varieties of drawing-pencils are immersed for a minute in very hot melted wax or suet before mounting them. To the composition for others a little lampblack is added, to increase and vary the degree of blackness. The pencils for asses' skin books and prepared paper are tipped with 'fusible metal.' Numerous improvements in pencil-cases and pencil-mounts have been patented of late years by Stevens and others.

PENNYROY'AL. *Syn.* Pulegium (Ph. L. & E.), Mentha p. (Ph. D.), L. "The recent and dried flowering herb of *Mentha pulegium*, Linn." (Ph. L.) Pennyroyal tea is a popular emmenagogue, expectorant, and diaphoretic, and is in common use in asthma bronchitis, hooping-cough, hysteria, suppressions, &c. Water, essence, oil, and spirit of pennyroyal, are officinal. They are now chiefly used as mere adjuncts or vehicles.

PEP'PER (Black). *Syn.* Pepper; Piper, B.P.; Nigri baccæ, Piper nigrum (Ph. L. E. & D.), L. "The immature fruit (berry) of *Piper nigrum*, Linn., or the black pepper vine." (Ph. L.)

Pur. The ground black pepper of the shops is universally adulterated. In fact, the public taste and judgment are so vitiated, that the pure spice is unsaleable. A most respectable London firm, on commencing business, supplied their customers with unadulterated ground pepper, but in 3 cases out of every 4 it was returned on their hands and objected to, on account of its dark colour and rich pungency, which had induced the belief that it was sophisticated. The house alluded to was therefore compelled by the customers to supply them with an inferior, but milder and paler, article. The substances employed to lower black pepper are known in the trade as—'P. D.,' 'H. P. D.,' and 'W. P. D.'—abbreviations of pepper dust, hot p. d., white p. d. The first is composed of the faded leaves of autumn, dried and powdered; the second, the ground husks (hulls) of black mustard, obtained from the mustard mills; and the third is common rice, finely powdered. Equal parts of black peppercorns, H. P. D., and W. P. D., form the very best ground pepper sold. The ordinary pepper of the shops does not contain more than ⅛th to ⅙th of genuine pepper, or 2 to 2½ oz. in the lb. Very recently, ground oil-cake or linseed meal has been chiefly employed as the adulterant, instead of the old 'P. D.'

Uses, &c. Black pepper is a powerful stimulant, carminative, and rubefacient. Its use, in moderation, as a condiment, is peculiarly serviceable to persons who are of a cold habit, or who suffer from a weak digestion; but in inflammatory habits, and in affections of the mucous membranes, it is generally highly injurious. As a medicine, it is often serviceable in nausea, vomiting, chronic diarrhœa, and agues. In North America, a common remedy for the last is ½ oz. of ground pepper stirred up with a glassful of warm beer; or a like quantity made into a tincture by steeping it in 5 or 6 times its weight of gin, rum, or whisky, for a few days.

Prepared black pepper is made by steeping the berries for 3 days in 3 times their weight of vinegar, and then drying and grinding them. It is milder than common pepper. See Confections, Piperine, &c.

Pepper, Cayenne. *Syn.* Bird pepper, Chili p., Guinea p. Indian p. Red p.; Piper

CAPSICI, P. CAYENNE, L. This is prepared from chillies, or the pods of *Capsicum frutescens*, or from *Capsicum baccatum*, or bird pepper, but generally from the first, on account of its greater pungency and acrimony; and, occasionally, from *Capsicum annuum* or medicinal capsicum.

Prep. 1. From the dried pods (powdered), 1 lb.; and wheaten bread or captain's biscuits (heated until they are perfectly dry and brittle, and begin to acquire a yellow colour throughout, and then powdered), 7 lbs.; mixed and ground together. Colouring matter and common salt are frequently added, but are unnecessary.

2. As the last, but making the mixture into a dough with water, then forming it into small cakes, drying these as rapidly as possible at a gentle heat, and then grinding them.

3. (London.) The ripe pods, dried in the sun, are stratified with wheaten flour in a dish or tray, and exposed in a stove-room or a half-cold oven until they are quite dry; they are then removed from the flour, and ground to fine powder; to every oz. of this powder, 1 lb. (say 15 oz.) of wheaten flour (including that already used) are added, and the mixture is made into a dough with a little tepid water and a teaspoonful of yeast; after fermentation is well set up, the dough is cut into small pieces, and baked in a slow oven until it is perfectly hard and brittle; it is then beaten or ground to powder, and forms 'cayenne pepper.'

Pure cayenne pepper, when burnt, leaves a scarcely perceptible quantity of white ash; a red-coloured ash indicates the presence of red ochre, brick-dust, Armenian bole, or other earthy colouring matter. If red lead is present, it will be left behind under the form of a dark-coloured powder, or a small metallic globule.

Pur. The 'cayenne pepper' of the shops is often a spurious article, made by grinding a mixture of any of the reddish woods or sawdust, with enough red pods or chillies to render the mixture sufficiently acrid and pungent. Common salt, colcothar, red bole, brick-dust, vermilion, and even red lead, are also common additions.

Uses, &c. The capsicums resemble the peppers, except in their greater energy and their pungency being unmodified, by the presence of essential oil. As a condiment, under the form of cayenne pepper, and in all diseases in which the employment of a powerful stimulant or rubefacient is indicated, their uses are well known. In medicine, the fruit of *Capsicum annuum* (Linn.—Ph. E. & D.; *C. fastigiatum*, Blume—B.P., Ph. L.), or annual capsicum is ordered (CAPSICUM—Ph. L. E. & D.). The London College directs the fruit to be that of 'Guinea,' less than one inch long, oblong, cylindrical, and straight." See ESSENCE OF CAYENNE.

Pepper, Prepared Cayenne, is the residuum of cayenne—vinegar, essence, or tincture, dried and ground (see *below*).

Pepper (Soluble), Cayenne. *Syn.* CRYSTALLISED SOLUBLE CAYENNE. *Prep.* 1. Capsicum pods (recent, ground in a pepper mill), 1 lb.; rectified spirit, 2½ pints; proceed by percolation so as to obtain 2½ pints; from this distil one half of the spirit by the heat of a water bath; to the residuum add of fine dry salt, 5 lbs.; mix them well together, and dry the mixture at a very gentle heat, frequently stirring; lastly rub it through a sieve, and put it into warm dry bottles. It is usually coloured with a little vermilion or rouge (sesquioxide of iron), but it possesses an agreeable colour without it.

2. Essence of cayenne (No. 1, page 580), 6 pints; distil off 3 pints, add to the residual liquor, of dry salt, 12 lbs.; mix well, dry by a gentle heat, and otherwise proceed as before.

3. Capsicums (ground), 3 lbs.; red sanders or Brazil wood (sliced or rasped), 10 oz.; rectified spirit, 1 gal.; macerate for 14 days, then express the tincture, filter, distil off one half, add of dry salt, 15 lbs., and proceed as before.

4. As the first formula, with the addition of a strong decoction of saffron, q. s. It gives a beautiful colour to soups, &c.

Obs. The above formulæ are those actually employed by the houses most celebrated for their 'soluble cayenne.' The products are of the very finest quality, and are perfectly wholesome. We speak from an extensive experience in the manufacture. The spirit distilled from the essence forms a most suitable menstruum for making fresh essence or tincture of cayenne.

Pepper, Cu'beb. See CUBEBS.

Pepper, Jamai'ca. See PIMENTO.

Pepper, Kit'chen. See SPICE.

Pepper, Long. *Syn.* PIPERIS LONGI FRUCTUS, PIPER LONGUM (Ph. L. & E.), L. "The immature fruit (dried female spikes) of *Piper longum*, Linn." (Ph. L.), or long-pepper vine. The spikes are about 1½ inch in length, with an indented surface, and are of a dark-gray colour. In its general properties it resembles black pepper, but it is less aromatic, though equally pungent. Elephant pepper is merely a larger variety of this species. (Gray.) The root and stems, sliced and dried, form the 'pippula moola' of the East Indies. (Roxburgh.)

Pepper, Red. See CAYENNE PEPPER.

Pepper, White. *Syn.* PIPER ALBUM, L. This is made by either soaking ordinary black pepper in a solution of common salt, until the outside skins are soft, and then rubbing them off in the hands, or by merely rubbing off the skins of the over-ripe berries that fall from the vines. An inferior quality is made by bleaching black pepper with chlorine.

Obs. The use of white pepper instead of black is an instance of the sacrifices made to please the eye. Pure white pepper has only about 1-4th of the strength of pure black pepper, whilst it is nearly destitute of the fine aroma of the latter. It also contains a mere trace of piperina or piperine, one of the most valuable constituents of black pepper.

PEP'PER PODS. Capsicums. See CAYENNE PEPPER.

PEP'PERMINT. *Syn.* MENTHA PIPERITA (Ph. L. E. & D.), L. "The recent and dried flowering herb of *Mentha piperita*" (Ph. L.), or garden peppermint. The flavour and odour of this herb are well known. It is the most pleasant and powerful of all the mints. Peppermint water and the essential oil have long been employed in nausea, griping, flatulent colic, hysteria, diarrhœa, &c.; but in regular practice chiefly to cover the taste of nauseous medicines, or as an adjunct or vehicle for more active remedies. See OILS (Volatile), WATERS, &c.

PEP'SIN. *Syn.* GASTERASE, CHYMOSIN. A peculiar principle found in the gastric juice, and which, in conjunction with hydrochloric acid, also present in the stomach, confers upon it the power of digesting certain portions of the food, and of dissolving, as Tuson has recently shown, calomel and other mineral substances.

Prep. 1. (Beale, 'Med. Times & Gaz.,' February 10th, 1872, p. 152.) "The mucous membrane of a perfectly fresh pig's stomach is carefully dissected from the muscular coat, and placed on a flat board. It is then lightly cleansed with a sponge and a little water, and much of the mucus, remains of food, &c., carefully removed. With the back of a knife, or with an ivory paper-knife, the surface is scraped very hard, in order that the glands may be squeezed and their contents pressed out. The viscid mucus thus obtained contains the pure gastric juice with much epithelium from the glands and surface of the mucous membrane. It is to be spread out upon a piece of glass, so as to form a very thin layer, which is to be dried at a temperature of 100° over hot water, or *in vacuo* over sulphuric acid. Care must be taken that the temperature does not rise much above 100 F°., because the action of the solvent would be completely destroyed. When dry the mucus is scraped from the glass, powdered in a mortar, and transferred to a well-stoppered bottle. With this powder a good digestive fluid may be made as follows:

Of the powder	5 grains.
Strong hydrochloric acid .	18 drops.
Water	6 ounces.

Macerate it at a temperature of 100° for an hour. The mixture may be filtered easily, and forms a perfectly clear solution very convenient for experiment.

"If the powder is to be taken as a medicine, from two to five grains may be given for a dose, a little diluted hydrochloric acid in water being taken at the same time. The pepsin powder may be mixed with the salt at a meal. It is devoid of smell, and has only a slightly salt taste. It undergoes no change if kept perfectly dry, and contains the active principle of the gastric juice almost unaltered.

"The method of preparing this pepsin was communicated to Mr. Bullock, of the firm of Messrs. Bullock and Reynolds, 3, Hanover Street, Hanover Square, who at once adopted it for the preparation of medicinal pepsin, and soon improved upon it in some particulars. The dose is from 2 to 4 or 5 grains. *Test.* 8 grains of this pepsin, with 10 drops dilute hydrochloric acid and an ounce of distilled water, dissolve 100 grains of hard-boiled white of egg in from twelve to twenty-four hours. In the body probably twice this quantity of white of egg or even more would be dissolved in a comparatively short space of time. The digestive powder prepared from the pig's stomach retains its activity for any length of time if kept dry. I had some which had been kept in a bottle for upwards of five years, and still retained its active power unimpaired. The solution made with this pepsin and hydrochloric acid was nearly tasteless and inodorous. One pig's stomach, which cost sixpence, will yield about 45 grains of the powder prepared as above described.

"Gradually the usefulness of this preparation of pepsin of the pig was found out, and it had to be prepared in increasing quantities. I should be afraid to say how many pigs' stomachs have been used of late years during the winter season.

"In 1857 Dr. Pavy carefully examined the pepsin prepared and sold by many different firms, and found that this dried mucus of the pig's stomach was the most active of them all ('Medical Times and Gazette,' 1857, vol. i, p. 336). In 1870 Professor Tuson instituted a still more careful comparative examination, and with a similar result ('Lancet,' August 13th, 1870); for he found that this preparation was *twenty-five times stronger than some others that he obtained for examination.*"

2. (Scheffer, 'Pharm. Journ.,' March 23rd, 1872, p. 761.) "Of the well-cleaned fresh hog stomach the mucous membrane is dissected off, chopped finely and macerated in water acidulated with muriatic acid for several days, during which time the mass is frequently well stirred. The resulting liquid, after being strained, is, if not clear, set aside for at least twenty-four hours in order to allow the mucus to settle. To the clarified liquid the same bulk of a saturated solution of sodium chloride is added, and the whole thoroughly mixed. After several hours the pepsin, which by the addition of chloride of sodium has separated from its solution, is found floating on the surface, from whence it is removed with a spoon and put upon cotton cloth to drain; finally it is submitted to strong pressure, to free it as much as possible from the salt solution.

"The pepsin, when taken from the press and allowed to become air dry, is a very tough substance, and presents, according to thickness, a different appearance, resembling in thin sheets parchment paper, and in thick layers sole leather; its colour varies from a dim straw yellow to a brownish yellow. Besides a little mucus, it contains small quantities of phosphate of lime and chloride of sodium, which, however, do not interfere with its digestive properties, as they are found also in normal gastric juice.

"In order to get a purer article I redissolve the pepsin, as obtained after expression, in acidulated water, filter the solution through paper and precipitate again with a solution of sodium chloride; the precipitate, after draining and pressing, is now free of phosphate of lime and mucus, but still contains salt. In the freshly precipitated state the pepsin is very readily soluble in water, and cannot therefore be freed from adhering salt by washing.

"By allowing the pressed sheet of pepsin to get perfectly air dry—whereby it becomes coated with a white film and small crystals of chloride of sodium—and by immersing it then in pure water for a short time, the greater part of sodium chloride can be extracted, but it has to be done very rapidly, as the pepsin swells up considerably and loses its tenacity. By operating in this manner I have obtained a pepsin which dissolves in acidulated water to quite a clear colourless liquid, but as it still contains traces of salt, I prefer to call it purified pepsin."

Pepsin, Saccharated. To work it into saccharated pepsin ('American Journal of Pharmacy,' January, 1871) the damp pepsin, as it is taken from the press, is triturated with a weighed quantity of sugar of milk to a fine powder, which, when it has become air dry, is weighed again, the quantity of milk sugar subtracted, and so the amount of pepsin found. The strength of this dry pepsin is now ascertained by finding how much coagulated albumen it will dissolve at a temperature of 100° F. in five or six hours, and after this sufficient milk sugar is added to result in a preparation of which ten grains will dissolve one hundred and twenty grains of coagulated albumen, and this preparation I have called saccharated pepsin.

PERCHLO″RATE. *Syn.* PERCHLORAS, L. A salt of perchloric acid.

The perchlorates are distinguished from the chlorates by their great stability, and by not turning yellow when treated with hydrochloric acid. Like the chlorates, they give off oxygen when heated to redness. They may be prepared by directly neutralising a solution of the acid with a solution of the base. See POTASSIUM (Perchlorate of), and CHLORINE.

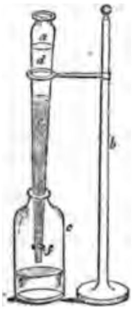
PERCHLO″RIC ACID. See CHLORINE.

PERCOLA′TION. *Syn.* METHOD OF DISPLACEMENT. A method of extracting the soluble portion of any substance in a divided state, by causing the menstruum to filter or strain through it. The 'sparging' of the Scotch brewers is an example of the application of this principle on the large scale. In pharmacy, the 'method of displacement' is frequently adopted for the preparation of tinctures, infusions, &c., and is, in some respects, superior to digestion or maceration. "The solid materials, usually in coarse or moderately fine powder, are moistened with a sufficiency of the solvent to form a thick pulp. In twelve hours, or frequently without delay, the mass is put into a cylinder of glass, porcelain, or tinned iron, open at both ends, but obstructed at the lower end by a piece of calico or linen, tied lightly over it as a filter; and the pulp being backed by pressure, ranging as to degree with different articles, the remainder of the solvent is poured into the upper portion of the cylinder, and allowed gradually to percolate. In order to obtain the portion of the fluid which is absorbed by the residuum, an additional quantity of the solvent is poured into the cylinder, until the tincture which has passed through equals in amount the spirit originally prescribed. The spirit employed for this purpose is then recovered, for the most part, by pouring over the residuum as much water as there is spirit retained in it, which may be easily known by an obvious calculation in each case. The method of percolation is now preferred by all who have made sufficient trial of it to apply it correctly." (Ph. E.)

The first portion of liquid obtained by the method of displacement is always in a state of high concentration. In general, it is a simple solution of the soluble ingredients of the crude drug in the fluid employed. But sometimes the solvent, if compound, is resolved into its component parts, and the fluid which passes through at any given time is only one of these, holding the soluble parts of the drug in solution. Thus, if diluted alcohol be poured over powder of myrrh, in the cylinder of the percolator, the fluid which first drops into the receiver is a solution of an oily consistence, chiefly composed of resin and volatile oil, dissolved in alcohol. In like manner, when the powder of gall-nuts is treated in the same way by hydrated sulphuric ether, two layers of fluid are obtained, one of which is a highly concentrated solution of tannin in the water of the ether, and the other a weak solution of the same principle in pure ether. In all cases, therefore, in which it is not otherwise directed, it is absolutely necessary to agitate the several portions of the liquid obtained by percolation together, in order to ensure a product of uniform strength or activity.

Several forms of displacement apparatus are employed by different operators. A simple and useful one is that figured in the margin. It has also the advantage of being inexpensive, and may be made by any worker in tin plate.

In operating on some substances it is found advantageous to hasten the process by pressure.



a. Percolator.

b. Stand.

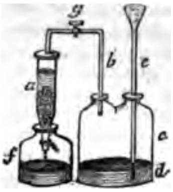
c. Receiver.

d. Menstruum.

e. Substance operated on.

Calico strainer.

This may be effected by any of the methods adopted for that purpose, and already described under FILTRATION. An ingenious little apparatus, which is well adapted for small quantities, is shown in the *engr*. By pouring mercury or water through (*e*), into the bottle (*c*), the air in the latter suffers compression, and acts in a corresponding manner on the percolating liquor in (*a*). The whole of the joints must be made air-tight.



a. Percolator.
b. Tube connecting it with—
c. A double-necked bottle containing—
d. Mercury.
e. Feeding-tube.
f. Receiver.
g. Stop-cock to regulate or arrest the pressure of air on the contents of the cylinder (*a*).

The method of displacement, although apparently simple, requires for its successful application no inconsiderable amount of experience and skill in manipulation. The principal points to be attended to are—the reduction of the substance to the proper state of comminution (neither too coarse nor too fine),—the due regulation of the period of maceration according to the hardness, density, and texture of the substance; and, more important still,—the proper packing of the ingredients in the cylinder. On the correct performance of the last the success of the process mainly depends. Some substances require considerable pressure to be used, whilst others, when even lightly packed, scarcely permit the fluid to pass through them. When the material is too loosely packed, the menstruum passes through quickly, but without exerting its proper solvent action; when too great pressure is employed, percolation either progresses very slowly or not at all. On the whole, the firmness of the packing should be inversely as the solvent and softening power of the menstruum upon the solids exposed to its action; but to this rule there are many exceptions, and each substance may be said to require special treatment. An excellent plan, applicable to all substances, and especially to those of a glutinous or mucilaginous nature, is to mix the powder with an equal bulk of well-washed siliceous sand before rubbing it up with the menstruum. In reference to the coarseness of the powder, it must be observed that substances which readily become soft and pappy when wetted by the menstruum, should not be used so fine as those that are more woody and fibrous, and not of a glutinous or resinous nature.

The 'method of displacement' has the advantage of expedition, economy, and yleiding products possessing considerable uniformity of strength; but the difficulties attending its application by the inexperienced are serious obstacles to its general adoption in the laboratory. It answers admirably for the preparation of all tinctures that are not of a resinous nature, and for most infusions of a woody and fibrous substances, as roots, woods, barks, leaves, seeds, insects, &c., and particularly when cold or tepid water is taken as the solvent. It is also especially adapted for the preparation of concentrated infusions and essences, as they may thus be obtained of any required strength without loss, or requiring concentration by heat, which is so destructive to their virtues.

"When (ordinary) tinctures are made in large quantities, displacement is never likely to supersede maceration, on account of any practical advantages it may possess. If the prescribed directions be duly attended to, the process of maceration is unexceptionable. The process is more simple than the other; the mode of operating is more uniform, it is, in fact, always the same; it requires less of skill and dexterity in conducting it; it requires less constant attention during its progress, which, in operating on large quantities is a consideration; and, finally, the apparatus required is less complicated. When, however, only small quantities of tincture are made at a time, and kept in stock, the adoption of the process of displacement will often be found convenient and advantageous. It offers the means of making a tincture in two or three hours, which, by the other process, would require as many weeks." (Mohr and Redwood.)

Another useful application of the method of displacement is to the manufacture of extracts on the large scale. Here it is superior to any other plan. By the simple and inexpensive forms of apparatus in block-tin, stoneware, or glass, which have recently been designed for the purpose, not merely a first-class product is ensured, but a great saving in fuel and labour is at the same time effected. See BREWING, EXTRACT, TINCTURE, &c.

PERCUS'SION. *Syn.* PERCUSSIO, L. In medicine, the act of striking any part of the body with the fingers, or any instrument, to ascertain its condition. See AUSCULTATION.

PERCUS'SION CAPS. The composition employed to prime these articles is noticed under Fulminating Mercury.

PER'FECT LOVE. See Liqueur (Parfait Amour).

PER'FUME. A substance that emits or casts off volatile particles which, when diffused through the atmosphere, agreeably affect the organs of smelling. The term is also applied to the volatile effluvia so perceived. The principal source of perfumes is the Vegetable Kingdom. Its flowers, seeds, woods, and barks, furnish a rich variety, from which the most fastidious connoisseur may select his favourite bouquet. A few perfumes, as musk, ambergris, and civet, are derived from the Animal Kingdom; but none of these evolve an aroma comparable in freshness to that of the rose, or in delicacy to that of the orange-blossom, or even the unpretending jasmine. The Inorganic Kingdom yields not a single perfume, so called; nor has the science of chemistry yet been able to produce a single odoriferous compound from matter absolutely inorganic.

PERFU''MERY. Perfumes in general; also the art of preparing them. In its commercial application, this word embraces not merely perfumes, but also cosmetics, and other articles of a closely allied character employed at the toilet, the manufacture and sale of which constitute the trade of the modern perfumer. Formulæ for the preparation of all the more valuable perfumes, as well as of others met with in trade, both simple and compound, will be found under the heads Cosmetics, Depilatory, Essence, Hair Dyes, Oils, Pastes, Pastils, Pommade, Spirit, Waters, &c., to which we refer the reader.

Perfumes, Ace'tic. See Vinegar.

Perfumes, Ammo''niated. These may be prepared by simply adding a sufficient quantity of ammonia to the liquid perfumes. When the articles are to be distilled, a cheaper plan is to add about 5 drs. of sal ammoniac and 8 drs. of carbonate of potassa to each pint of the article just before distillation. Ammoniated Cologne water is now a fashionable substitute for spirit of sal volatile.

PERIOD'IC ACID. See Iodine.

PERISTAL'TIC PERSUA'DERS. See Pills (Kitchener's).

PER'MANENT WHITE. See Baryta (Sulphate) and White Pigments.

PERNAMBU'CO WOOD. *Syn.* Peach wood. The wood of *Cæsalpinia echinata.* It constitutes the paler variety of Brazil wood used by the dyers.

PER'RY. *Syn.* Pyraceum, L. A fermented liquor prepared from pears in the same way as cider is from apples. The red rough-tasted sorts are principally used for this purpose. The best perry contains about 9% of absolute alcohol; ordinary perry, from 5 to 7%.

Perry is a very pleasant-tasted and wholesome liquor. When bottled 'champagne fashion,' we have seen it frequently passed off for champagne, without the fraud being suspected.

PER'SIAN BER'RIES. See French Berries.

PERSPIRA'TION. The liquid or vapour secreted by the ramifications of the cuticular arteries over the surface of the body. The perspiratory apparatus consists of a gland deeply seated in the corium, communicating by means of tubules (pores) with the surface of the scarf-skin.

The uses of the perspiratory functions appear to be to preserve the suppleness and sensibility of the skin, to maintain the temperature of the body at a uniform standard, and to remove from the system a number of compounds noxious to animal life. The perspiration "is a fluid whose regularity and continuance of exhalation are not merely conducive but absolutely necessary, to health; without such regularity, the animal temperature would run riot, and substances of an injurious quality would be allowed to permeate the finest and most delicate of the tissues of the body." (Eras. Wilson.) "From the constriction or constipation of the cutaneous pores by the ambient air, especially when the body, beforehand put into a heat, is suddenly exposed thereunto, the serous particles, which used to fly off continually in vapour, being now pent in, ecite an ixntense and feverish effervescence; till, finding some other passage, either by the kidneys or by the glandules of the nose and windpipe, they are discharged by way of a catarrh; or, missing this separation, still keep up the ebullition, very often to the harard of life, by suffocating the vital flame. And this is the natural consequence of obstructed insensible perspiration, which, in the vulgar phrase, is the same with what they mean by catching cold, and of which, give me leave to remark, that as fevers make two thirds of diseases infesting mankind, according to the computation of the judicious Sydenham, so two thirds of fevers very probably may take their rise from perspiration hindered." (Daniel Turner.) Suppressed perspiration is also one of the commonest causes of diarrhœa,

PERU'VIAN BALSAM. See Balsam of Peru.

PERU'VIAN BARK. See Cinchona.

PES'SARY. *Syn.* Pessum, Pessarium, L. An instrument made of caoutchouc, gutta percha, box-wood, or ivory, inserted into the vagina to support the mouth and neck of the uterus. They are variously formed, to meet the prejudices of the party or the necessities of the case. The cup, conical, globe, and ring pessaries (pessi) are those best known.

Medicated pessaries are prepered by adding the active ingredients to a hard cerate, and pressing the mixture into the desired form. Astringents (various), belladonna, acetate of lead, iodine, mercury, opium, &c., have been thus applied by Dr. Simpson and others.

PESTILENCE. See Plague.

PESTILEN'TIAL DISEASES. All those diseases which are epidemic and malignant and assume the character of a plague. See Cholera, &c.

PETONG'. Same as *packfong*.

PET'ROLENE. The pure liquid portion of mineral tar. It has a pale yellow colour, a penetrating odour, and a high boiling-point; is lighter than water, and is isomeric with the oils of turpentine and lemons. In its general proportions, it resembles rectified mineral naphtha.

PETRO'LEUM. *Syn.* Rock oil, Liquid bitumen, Oil of petre; Oleum petræ, Bitumen liquidum, L. Petroleum is an oil found oozing from the ground or obtaned on sinking wells in the soil. To a limited extent it is met with in most countries of Europe and in the West India islands, but occurs in abundance in Pennsylvania and other parts of the United States and in Canada. It varies in colour from slight yellow to brownish black, in consistence from a thin mobile liquid to a fluid as thick as treacle, in specific gravity from 800 to 1100 (water being 1000) and is either clear and transparent or turbid and opaque. Petroleum is essentially a volatile oil, and when submitted to distillation yields gases homologous with light carburetted hydrogen of marsh-gas (Ronalds obtained three), liquids of similar constitution (Pelouze and Cahours isolated twelve), and solid paraffin-like bodies. Commercially petroleum is distilled so as to yield petroleum-spirit or mineral naphtha used as a substitute for turpentine and for burning in sponge-lamps and costermongers' barrow-lamps; petroleum oil used all over the world as mineral lamp oil for illuminating purposes; and a heavy oil employed for lubricating machinery. The value of a sample of rock-oil is determined by thus distilling a weighed quantity in a small glass retort and weighing the products. The petroleum or middle product must be of such a character as to have a specific gravity not higher than 810 or 820 and to contain so little petroleum spirit that it only evolves inflammable vapour when heated to 100° Fahr. in the manner prescribed in the Petroleum Act, 1871 (see *below*). Any petroleum product or mineral oil which will not stand this test, and which is kept in larger bottles than one pint, and in larger total quantity than three gallons cannot be stored or sold except by licence of the local authorities.

Directions for Testing Petroleum to ascertain the temperature at which it gives off inflammable vapour.

The vessel which is to hold the oil shall be of thin sheet iron; it shall be two inches deep and two inches wide at the opening, tapering slightly towards the bottom; it shall have a flat rim, with a raised edge one quarter of an inch round the top; it shall be supported by this rim in a tin vessel four inches and a half deep and four and a half inches in diameter; it shall also have a thin wire stretched across the opening, which wire shall be so fixed to the edge of the vessel that it shall be a quarter of an inch above the surface of the flat rim. The thermometer to be used shall have a round bulb about half an inch in diameter, and is to be graduated upon the scale of Fahrenheit, every ten degrees occupying not less than half an inch upon the scale.

The inner vessel shall be filled with the petroleum to be tested, but care must be taken that the liquid does not cover the flat rim. The outer vessel shall be filled with cold, or nearly cold water; a small flame shall be applied to the bottom of the outer vessel, and the thermometer shall be inserted into the oil so that the bulb shall be immersed about one and a half inches beneath the surface. A screen of pasteboard or wood shall be placed round the apparatus, and shall be of such dimensions as to surround it about two-thirds, and to reach several inches above the level of the vessels.

When heat has been applied to the water until the thermometer has risen to about 90° Fahr., a very small flame shall be quickly passed across the surface of the oil on a level with the wire. If no pale blue flicker or flash is produced, the application of the flame is to be repeated for every rise of two or three degrees in the thermometer. When the flashing-point has been noted, the test shall be repeated with a fresh sample of the oil, using cold, or nearly cold, water as before; withdrawing the source of heat from the outer vessel when the temperature approaches that noted in the first experiment, and applying the flame test at every rise of two degrees in the thermometer. See Naphtha, Oils (Mineral), &c.

PEW'TER. This is an alloy of tin and lead, or of tin with antimony and copper. The first only is properly called pewter. Three varieties are known in trade;—

Prep. 1. (Plate Pewter.) From tin, 89%; antimony, 7%; bismuth and copper, of each, 2%; fused together. *Used* to make plates, teapots, &c. Takes a fine polish.

2. (Triple Pewter. From tin, 79%; antimon, 15%; lead, 6%; as the last. *Used* for minor articles, syringes, toys, &c.

3. (Ley Pewter.) From tin, 80%; lead, 20%. *Used* for measures, inkstands, &c.

Obs. According to the report of the French commission, pewter containing more than 18 parts of lead to 82 parts of tin is unsafe for measures for wine, and similar liquors and, indeed, for any other utensils exposed to contact with our food or beverages. The legal sp. gr. of pewter in France is 7·764; if it be greater, it contains an excess of lead, and is liable to prove poisonous. The proportions of these metals may be approximately determined from the sp. gr.; but correctly, only by an assay for the purpose. See BRASS, GERMAN SILVER, LEAD, and TIN.

PHE'NOL. C_6H_6O. See CARBOLIC ACID.

PHE'NYL. C_6H_5. The hypothetical compound radical of the phenyl-series. Carbolic acid is said to be its hydrate.

PHENYL'AMINE. $C_6H_5H_2N$. Aniline is sometimes so named on account of its relation to the phenyl series.

PHILO'NIUM. The ancient name of an aromatic opiate, reputed to possess many virtues, invented by Philo. See CONFECTION OF OPIUM.

PHILOS'OPHER'S STONE. *Syn.* LAPIS PHILOSOPHORUM, L. A wonderful substance, the discovery of which formed the day dreams of the alchemists. It was supposed to be capable of converting all the baser metals into gold, and of curing all diseases. Some of the alchemists appear to have laboured under the delusion that they had actually discovered it. The last of these enthusiasts was the talented and unfortunate Dr. Price, of Guildford. Speaking of the age of alchemy, Liebig says,—"The idea of the transmutability of metals stood in the most perfect harmony with all the observations and all the knowledge of that age, and in contradiction to none of these. In the first stage of the development of science, the alchemists could not possibly have any other notions of the nature of metals than those which they actually held. . . . We hear it said that the idea of the philosopher's stone was an error; but all our views have been developed from errors, and that which to-day we regard as truth in chemistry may, perhaps, before tomorrow, be regarded as a fallacy."

PHILOSOPH'IC CANDLE. An inflamed jet of hydrogen gas.

PHILOSOPHIC WOOL. Flowers of zinc.

PHIL'TRE. *Syn.* PHILTRUM, L. A charm or potion to excite love. The ancients had great faith in such remedies. Nothing certain is now known respecting their composition; but there is sufficient evidence that recourse was frequently had to them by the ancients, and that "their operation was so violent that many persons lost their lives and their reason by their means." The Thessalian philtres were those most celebrated. (Juv., vi, 610, &c.) At the present day the administration of preparations of the kind is interdicted by law.

PHLORE'TIN. $C_{15}H_{14}O_5$. A crystallisable, sweet substance, formed along with grape sugar, when phloridzin is acted on by dilute acids.

PHLORID'ZIN. $C_{21}H_{24}O_{10}$. *Syn.* PHLORIZINE; PHLORIDZINUM, L. *Prep.* By acting on the fresh root-bark of the apple, pear, or plum tree, with boiling rectified spirit; the spirit is distilled off, and the phloridzin crystallizes out of the residual liquor as it cools.

Prop &c. Fine, colourless, silky needles, freely soluble in rectified spirit and in hot water, but requiring 1000 parts of cold water for its solution; its taste is bitter and astringent. When its solution is boiled with a little dilute sulphuric acid or hydrochloric acid, it is changed into grape sugar and phloretin.

Phloridzin bears a great likeness to salicin. It is said to be a powerful febrifuge. *Dose.* 3 to 15 grs.

PHOCE'NIC ACID. See DELPHINIC ACID.

PHŒNIC'INE. See INDIGO PURPLE.

PHOS'GENE GAS. See CHLOROCARBONIC ACID.

PHOS'PHATE. *Syn.* PHOSPHAS, L. A salt of phosphoric acid. See PHOSPHORIC ACID and the respective metals.

PHOS'PHIDE. See PHOSPHURET.

PHOS'PHITE. *Syn.* PHOSPHIS, L. A salt of phosphorous acid. See PHOSPHOROUS ACID.

PHOS'PHORUS. P.

Prep. This is now only conducted on the large scale:—Bone-ash (in powder), 12 parts, and water 24 parts, are stirred together in a large tub until the mixture is reduced to a perfectly smooth 'pap'; oil of vitriol, 8 parts, is then added in a slender stream, active stirring being employed during the whole time, and afterwards until the combination appears complete; the next day the mass is thinned with cold water, and, if convenient, heated in a leaden pan or boiler until it has entirely lost its granular character; it is now transferred to one or a series of tall casks (according to the extent of the batch), and further diluted with a large quanty of water; after repose, the clear liquid is decanted, the sediment washed with water, and the 'washings' and 'decanted liquor' evaporated in a leaden or copper boiler until the white calcareous deposit (gypsum) becomes considerable; the whole is then allowed to cool, the clear portion decanted, and the sediment thoroughly drained on a filter; the liquid thus obtained is evaporated in an iron pot to the consistence of a thick syrup (say 4 parts), when dry charcoal (in powder), 1 part, is added, and the desiccation continued until the bottom of the pot becomes nearly red hot, after which it is covered over and allowed to cool; the dry mixture, when cold, is put into one or more earthen retorts well covered with 'luting' and properly dried, and heat is applied (sideways rather than at the bottom) by means of a good air-furnace; after a short time the beak of the retort is connected with a copper tube, the other end of which is made to dip about one fourth of an inch beneath the surface of some lukewarm water placed in a trough or wide-mouthed bottle.

The distilled product is purified by squeezing it through chamois leather under warm water, and is then moulded for sale by melting it under water heated to about 145° Fahr., and sucking it up to any desired height in slightly tapering, but perfectly straight, glass tubes, previously warmed and wetted. The bottom of the tube being now closed with the finger, it is withdrawn, and transferred to a pan of cold water to congeal the phosphorus, which will then commonly fall out, or may be easily expelled by pressure with a piece of wire.

Prop., &c. Phosphorus, in its normal condition, is a pale yellow, semi-transparent, and highly combustible solid; soft and flexible at common temperatures; it becomes waxy at about 75° Fahr.; melts at about 111° and boils at 550° Fahr.; it takes fire in the air at 165°, and oxidates at all temperatures above 32°. Exposed to the air below 60°, its surface is slowly converted into phosphorous acid. It is apparently insoluble in water, but it conveys its peculiar flavour and odour to that fluid when agitated with it; it is slightly soluble in ether, naphtha, and the fixed and volatile oils, and more freely so in bisulphide of carbon. It unites with oxygen, forming oxides, and with oxygen and hydrogen, forming acids, and with the metals, forming phosphides.

Phosphorus is remarkable for assuming several allotrophic forms. In one of these forms (amorphous phosphorus) its properties are so altered that they might be those of a distinct element.

Uses. The principal consumption of phosphorus is in the manufacture of lucifer matches. When swallowed, it acts as a powerful corrosive poison; but small doses of its ethereal and oily solutions are occasionally administered in cases of chronic debility, extreme prostation of the nervous powers, impotency, &c. Its action is that of a powerful diffusible stimulant and diuretic; it is also aphrodisaic. Its use requires great caution, and the effects must be narrowly watched. The treatment of poisoning by phosphorus consists of the administration of a powerful emetic and the copious use of mucilaginous drinks.

Concluding remarks. From the great inflammability of phosphorus it can only be safely preserved under water. In commerce, it is always packed in tin cylinders filled with water, and soldered up air-tight. The leading points to be observed to ensure success in this manufacture are chiefly connected with the firing. The heat of the furnace should be most slowly raised at first, but afterwards equably maintained in a state of bright ignition. After 3 or 4 hours of steady firing, carbonic and sulphurous anhydride are evolved in considerable abundance, provided the materials had not been well dried in the iron pot; then sulphuretted hydrogen makes its appearance, and next phosphuretted hydrogen, which last should continue during the whole of the distillation. The firing should be regulated by the escape of this remarkable gas, which ought to be at the rate of about two bubbles per second. If the discharge comes to be intercepted, it is to be ascribed either to the temperature being two low, or to the retort getting cracked; and if, upon raising the heat sufficiently, no bubbles appear, it is a proof that the apparatus has become defective, and that it is needless to continue the operation. We may infer that the process approaches its conclusion by the increasing slowness with which the gas is disengaged under a powerful heat; and when it ceases to come over we may cease firing, taking care to prevent reflux of water into the retort (and consequent explosion), from condensation of its gaseous contents, by admiting air into it through a recurved glass tube, or through the tube of the copper adapter. The usual period of the operation, upon the great scale, is from 24 to 30 hours.

Phosphorus, Amor'phous. *Syn.* RED PHOSPHORUS, ALLOTROPIC PHOSPHORUS; PHOSPHORUS FUSCUS, P. RUBER. L. This is phosphorus in that peculiar condition to which Berzelius has applied the term "allotropic." The honour of its discovery is due to Dr. Shrötter, of Vienna.

Prep. The ordinary phosphorus of commerce, rendered as dry as possible, is placed in a shallow vessel of hard and well-annealed Bohemian glass, fitted with a safety tube just dipping beneath the surface of a little hot water contained in an adjacent vessel; heat is then applied by means of a metallic bath (a mixture of lead and tin), the temperature of which is gradually raised until it ranges between 464 and 482° Fahr., and bubbles of gas escape from the end of the safety tube and catch fire as they come in contact with the air; this temperature is maintained until the amorphous condition is produced, the length of the exposure being regulated by a miniature operation with tubes conducted in the same bath; as soon as this point is reached, the apparatus is allowed to cool, and the amorphous phosphorus, which still contains some unconverted phosphorus, detached from the glass; it is then reduced to powder by careful trituration under water, drained on a calico filter, and, whilst still moist, spread thinly on shallow trays of iron or lead; in this state it is exposed, with frequent stirring, to heat in a chloride of calcium bath, at first gentle, and then gradually increased to its highest limit, and the heat continued until no more luminous vapour escapes; the residuum on the trays is then cooled, washed with water until this last ceases to affect test paper, and is, lastly, drained and dried. To render it absolutely free from unaltered phosphorus, it may be washed with bisulphide of carbon.

On the small scale, common phosphorus may be converted into amorphous phosphorus by simply exposing it for 50 or 60 hours to a temperature of about 473° Fahr., in any suitable vessel from which the air is kept excluded by a stream of carbonic acid, or any other gas which is unable to act chemically on the phosphorus.

By keeping common phosphorus fused at a high temperature, under the above conditions, for fully 8 days, compact masses of amorphous phosphorus may be obtained.

Prop., *&c.* A reddish-brown, infusible, inodorous, solid substance, which is reconverted into ordinary phosphorus by simply exposing it to a heat a little above 500° Fahr. It is unaltered by atmospheric air; is insoluble in bisulphide of carbon, alcohol, ether, or naphtha; is non-luminous in the dark below about 390° Fahr.; and does not take fire at a lower temperature than that necessary for its reconversion into the common or crystalline form. The sp. gr. ranges between 2·089 to 2·017, according to the method of preparing it. Its properties render it an admirable substitute for the common phosphorus in the composition for tipping matches, both as regards security from spontaneous ignition and the health of the manufacturers; but the anticipations that it would be thus generally applied, owing to its high price, have not yet been realised.

Phosphorus, Trichloride of. PCl_3. *Syn.* Phosphorous Terchloride, Phosphorous Chloride. By gently heating phosphorus, in excess, in dry chlorine gas; or by passing the vapour of phosphorus through a stratum of powdered mercuric chloride, strongly heated in a glass tube. It is limpid, colourless, highly fetid, fumes in the air, and is slowly resolved by water into phosphorous acid and hydrochloric acid. Sp. gr. 1·45.

Phosphorus, Pentachloride of. PCl_5. *Syn.* Phosphoric chloride, Perchloride of Phosphorus.

Prep. By the spontaneous combustion of phosphorus in an excess of dry chlorine; or by passing a stream of dry chlorine into the liquid terchloride. By the first method it is obtained as a white crystalline sublimate; by the second, as a solid crystalline mass. It is volatile; water resolves it in phosphoric acid and hydrochloric acid.

Phosphorus, Oxychloride of. PCl_3O. *Syn.* Phosphoric oxychloride, Phosphoric monooxychloride.

Prep. By heating pentachloride of phosphorus with a quantity of water insufficient to convert it into phosphoric acid. It is a colourless, fuming liquid, having the sp. gr. 1·7.

Phosphorus, Hydride of. PH_3. *Syn.* Phosphoretted Hydrogen, Phosphuretted hydrogen.

Prep. 1. Phosphorous acid is gently heated in a retort, and the first portion of the gas collected.

2. From phosphorus (in small lumps) boiled in a solution of hydrate of potassium or milk of lime, contained in a small retort, as before. Take a very small thin retort, capable of holding not more than 1 oz. or 1½ oz. of water; place in this 3 or 4 fragments of the sticks of fused hydrate of potassium, each being about ½ inch in length; add as much water as will barely cover them, and then drop in a small fragment of phosphorus, about the size of a horse-bean; apply a very gentle heat with the small flame of a spirit lamp, agitating the retort continually. A pale lambent flame will first appear in the interior, and when this reaches the orifice, and burns in the open air, the retort should be placed on the stand with its beak about an inch under water. Care must be taken not to withdraw the flame of the lamp. When the bubbles of the gas rise to the surface they spontaneously inflame.

3. From phosphide of calcium and dilute hydrochloric acid, as above; or simply from the phosphide thrown into water.

Obs. The gas obtained by methods 2 and 3 is contaminated with the vapour of a liquid phosphide of hydrogen, PH_2, which gives to it the property of spontaneous inflammability.

Prop., *&c.* Colourless; very fetid; slightly soluble in water; burns with a white flame; decomposed by light, heat, and strong acids; as commonly prepàred, inflames on contact with air, at ordinary temperatures, but when pure, only at the heat of boiling water. Sp. gr. 1·24. It is rendered quite dry by standing over fused chloride of calcium.

Phosphorus, Suboxide of. P_4O. (Odling.) A reddish-brown powder, formed when a stream of oxygen is forced upon phosphorus, melted beneath the surface of hot water. To purify it from phosphoric acid and free phosphorus, it is washed on a filter with water, then dried by bibulous paper, and finally digested with bisulphide of carbon.

Hypophosphorous Acid. H_3PO_2. By cautiously decomposing a solution of hypophosphite of barium with sulphuric acid, filtering from the precipitate (sulphate of baryta), and evaporating. Dissolve hypophosphite of calcium, 480 grs. in distilled water, 6 fl. oz.; dissolve crystallised oxalic acid, 350 grs., in another portion of distilled water, 3 fl. oz.; mix the solutions and filter the mixture through white filtering paper. Add distilled water carefully to the filtrate till it measures 10 fl. oz., and evaporate this to 8½ fl. oz. The solution thus prepared contains about 10% of terhydrated hypophosphorous acid.

Prop. A viscid, uncrystallisable liquid having a strongly acid reaction. It is a powerful drying agent, and forms salts called hypophosphites.

Ammonium, Hypophosphite of. $(NH_4)_3 PO_2$. *Prep.* Dissolve hypophosphite of calcium, 6 oz., in water, 4 pints; and dissolve translucent sesquicarbonate of ammonium, 7·23 oz. (barely 7¼), in water, 2 pints; mix the solutions; filter, washing out the solution retained by the carbonate of lime with water, q. s.; evaporate the filtrate to dryness with great care; dissolve it in alcohol, q. s.; filter, evaporate, and crystallise. Very soluble in both alcohol and water.

Barium, Hyperphosphite of. $Ba_3(PO_4)_2$.

Prep. Boil phosphorus in a solution of hydrate of barium (baryta water) till all the phosphorus disappears and the vapours have no longer a garlic odour. Filter, evaporate, and set aside to crystallise.

Calcium, Hypophosphite of. $Ca_3(PO_2)_2$.

Prep. Slack recently burned lime, 4 lbs., with water, 1 gall., and mix it with water, 4 galls., just brought to the boiling temperature in a deep open boiler, stirring until a uniform milk of lime is formed; then add phosphorus, 1 lb., and keep up the boiling constantly, adding hot water from time to time, so as to preserve the measure as nearly as may be until all the phosphorus is oxidised and combined, and the strong odour of the gas has disappeared; then filter the solution through muslin, wash out that portion retained by the calcareous residue with water, and evaporate the filtrate till reduced to 6 pints; re-filter, to remove a portion of carbonate of calcium resulting from the action of the air upon the solution; evaporate again until a pellicle forms, and set aside to crystallise—or continue the heat with constant stirring until the salt granulates.

Obs. As spontaneously inflammable phosphoretted hydrogen is given off during the boiling, the process must be conducted under a hood, with a strong draught or in the open air. Smaller proportions than those given may be used.

Prop. Hypophosphite of calcium is a white salt, with pearly lustre, crystallising in flattened prisms; soluble in 6 parts of cold water, and slightly soluble in dilute alcohol. It is the most important of these compounds, and when introduced into the stomach it is supposed to be converted into phosphate of calcium. It has been termed 'chemical food.' By decomposition it readily furnishes the other hypophosphites.

Ferric, Hyperphosphite of. $FePO_2$. *Prep.* By precipitating a solution of hypophosphite of sodium or ammonium, with solution of ferric sulphate, washing the gelatinous precipitate with care (it being somewhat soluble); and, finally, drying it into an amorphous white powder. This is freely soluble in hydrochloric and hypophosphorous acids.

Potassium, Hypophosphite of. K_3PO_2. *Prep.* From hypophosphite of calcium, 6 oz., dissolved in water, 4 pints; and granulated carbonate of potassium, 5¼oz., dissolved in water, ½pint. Mix, filter, and wash the precipitate till the filtrate measures 5 pints. Evaporate till a pellicle forms, then stir constantly, continuing the heat till the salt granulates. A white, opaque, deliquescent body, very soluble in water and alcohol.

Quinine, Hypophosphite of. Dissolve sulphate of quinine, 1 oz., in water, by the aid of diluted sulphuric acid; precipitate the alkaloid with ammonia; wash the precipitated quinine and digest it in hypophosphorous acid with heat (the quinine being in excess); after filtering the solution, allow it to evaporate spontaneously till the required salt crystallises. It forms elegant tufts of soft, feathery crystals, which are soluble in 60 parts water.

Sodium, Hypophosphite of. Na_3PO_2. *Prep.* From hypophosphite of calcium, 6 oz., dissolved in water, 4 pints; and crystallised carbonate of sodium, 10 oz., dissolved in water, 1½ pint. Proceed as in making hypophosphite of potassium, but allowing 6 pints as the measure of the filtrate. If required in crystals, the granulated salt may be dissolved in alcohol sp. gr. ·835, evaporated till syrupy, and set by in a warm place. Crystallises in rectangular tables, with a pearly lustre; is very soluble in water and ordinary alcohol, and deliquesces when exposed to the air.

Phosphorus, Trioxide of. P_2O_3. *Syn.* PHOSPHOROUS ANHYDRIDE; ANHYDROUS PHOSPHORIC ACID.

Prep. By burning phosphorus in a limited supply of air. White flaky powder, with an odour of garlic, and rapidly absorbing water to form phosphorous acid.

Phosphorous Acid. H_3PO_3. *Syn.* HYDRATED PHOSPHOROUS ACID. Pure phosphorus is volatilised through a layer of powdered mercuric chloride, contained in a glass tube; terchloride of phosphorus comes over, which, on being mixed with water, is resolved into hydrochloric acid and phosphorous acid; by evaporating the mixed liquid to the consistence of a syrup, the first is expelled, and the residuum forms a crystalline mass of hydrated phosphorous acid on cooling.

Prop., &c. It is a powerful deoxidising agent. Heated in a closed vessel, it is resolved into hydrated phosphoric acid and pure phosphuretted hydrogen gas. With the bases it forms salts, called phosphites, which possess little practical importance.

Phosphorous Pentoxide Acid. P_2O_5. *Syn.* ANHYDROUS PHOSPHORIC ACID; PHOSPHOROUS ANHYDRIDE; PHOSPHORIC OXIDE. By the vivid combustion of phosphorus in a stream of dry atmospheric air, or under a bell-jar, copiously supplied with dry air. The product is pure anhydrous phosphoric acid under the form of snow-like flakes. It must be immediately collected and put into a warm, dry, well-stoppered bottle. In this state it exhibits an intense attraction for water, and when thrown into it combines with explosive violence; exposed to moist air for only a few seconds, it deliquesces to a syrupy-looking liquid.

Phosphoric Acid. There are three distinct acids usually grouped under this head, namely, METAPHOSPHORIC ACID, HPO_3; PYROPHOSPHORIC ACID, $H_4P_4O_7$; and PHOSPHORIC ACID, H_3PO_4.

Metaphosphoric Acid. HPO_4. *Syn.* MONOBASIC PHOSPHORIC ACID; GLACIAL PHOSPHORIC ACID.

Prep. Bones (calcined to whiteness and powdered), 3 parts, are digested for several days in oil of vitriol, 2 parts, previously diluted with water, 6 parts, the mixture being frequently stirred during the time; a large quantity of water is next added, the whole thrown in a strainer, and the residual matter washed with some hot water; the mixed liquors are then precipitated with a solution of carbonate of ammonium, in slight excess, filtered from the insoluble, finally ignited in a platinum crucible.

By acting upon the anhydride with cold water.

When phosphoric acid is added to a strong solution of phosphate of zirconium, and the mixture, after concentration, is exposed to a low temperature, prismatic crystals are deposited. These, after being strongly heated to expel their basic water, are pure metaphosphate of sodium. From the solution of this salt in cold water, a solution of pure metaphosphoric acid may be obtained, as above, by means of nitrate or acetate of lead and sulphuretted hydrogen.

Obs. This acid precipitates the salts of silver white, and is distinguished from the other modifications of phosphoric acid by the property which its solution possesses of coagulating albumen.

Pyrophosphoric Acid. $H_4P_2O_7$. *Syn.* DIBASIC PHOSPHORIC ACID. By strongly heating common or phosphate of sodium. The water of crystallisation only is at first expelled, and the salt becomes anhydrous; but as the temperature reaches that of redness the salt loses water and is decomposed. By solution of the altered salt in water, crystals of pyrophosphate of sodium may be obtained. A solution of this last compound, treated with nitrate of lead, and the resulting precipitate, suspended in cold water, and decomposed by sulphuretted hydrogen, yields a solution of pure pyrophosphoric acid.

Obs. Heat resolves this into a solution of the ordinary acid. Pyrophosphoric acid precipitates the salts of silver of a white colour. The salts of this acid are called pyrophosphates.

Phosphoric Acid. H_3PO_4. *Syn.* TRIHYDRIC PHOSPHATE, TRIBASIC PHOSPHORIC ACID, ORTHOPHOSPHORIC ACID. Ordinary nitric acid is heated in a tubulated retort connected with a receiver, and small fragments of phosphorus are dropped into it, singly and at intervals; as soon as the oxygenation of the phosphorus is complete, the heat is increased, the undecomposed acid distilled off, and the residuum evaporated to the consistence of a syrup. In this state it forms the phosphoric acid of the shops. Commercial phosphate of sodium is dissolved in water and the solution precipitated with another of acetate of lead; an abundant white precipitate (phosphate of lead) falls; this is collected on a filter, well washed, and, whilst still moist, is suspended in distilled water, and sulphuretted hydrogen gas passed into it, in excess; a black insoluble precipitate forms, while pure tribasic phosphoric acid remains in solution, and is easily deprived of the residual sulphuretted hydrogen by a gentle heat. By concentration in vacuo over sulphuric acid, it may be obtained in thin crystalline plates.

The solution of this acid may be boiled without change, but when concentrated and heated to about 400° Fahr. it is converted into pyrophosphoric acid, and at a red heat into metaphosphoric acid. Its salts are the ordinary phosphates, or nitrophosphates, and they give a yellow precipitate with nitrate of silver.

Tests. The following reactions characterise the ordinary or other phosphates:—1. Chloride of barium produces in aqueous solutions of the neutral and basic phosphates a white precipitate, which is insoluble in either hydrochloric or nitric acid, and with difficulty soluble in a solution of chloride of ammonium.—2. Solution of sulphate of calcium produces in neutral and alkaline solutions of the phosphates a white precipitate, freely soluble in acids, even the acetic.—3. Sulphate of magnesium produces in solutions of the phosphates, to which some chloride of ammonium and free ammonia has been added, a white, crystalline, and quickly subsiding precipitate of the phosphate of ammonium and magnesium, which is insoluble in a solution of either ammonia or chloride of ammonium, but readily soluble in acids, even the acetic.—4. Nitrate of silver, with neutral and basic alkaline phosphates, gives a light yellow precipitate. If the fluid in which the precipitate is suspended contained a basic phosphate, it does not affect test paper; if it contained a neutral phosphate, the reaction will be acid. If the phosphate examined has been heated to redness before solution, it then, as a metaphosphate, gives a white precipitate with nitrate of silver.—5. Hydrochloric acid is added to the solution to acid reaction, and afterwards 1 or 2 drops of a concentrated solution of ferric chloride; a solution of acetate of potassium is next added in excess, when a flocculent, gelatinous, white precipitate will be formed if phosphoric acid or any phosphate was present in any form or combination in the original liquor. This test is highly characteristic, and of general applicability.—*Obs.* The insoluble phosphates must be first treated with diluted hydrochloric or sulphuric acid, and the resulting solution filtered and neutralised with an alkali, before applying the reagents. When the substance under examination consists of a very small quantity of phosphoric acid or phosphate, with a large quantity of sesquioxide of iron, it should be fused with some carbonate of sodium, the residuum of the ignition exhausted with water, and the tests applied to the filtered solution. Arsenious acid, if present, should be removed by sulphuretted hydrogen before applying the tests. When phosphate of aluminum, the solution in hydrochloric acid is neutralised with carbonate of sodium; carbonate of barium is next added in excess, followed by the addition of hydrate potassium, also in excess, after which the whole is boiled. An insoluble phosphate of barium is formed, which may be decompose by sulphuric acid, as before. See MOLYBDATE OF AMMONIUM.

Estim. Pure solutions or phosphoric acid may be tested by the common methods of acidimetry. When in a state of combination, it may be separated and weighed in either of the forms noticed under GUANO.

Uses, &c. This acid is the common form, and is the compound alluded to when 'phosphoric acid' is spoken of. It is extensively employed by the bleacher, dyer, calico-printer, and enameller. Unlike sulphuric acid and the other strong acids, it does not coagulate albumen nor injure vegetable fibre, and is not decomposed by contact with organic matter. In combination with alumina and a large boracic acid, it is said to be capable of producing a glaze for earthenware of extreme beauty and durability, and perfecty innocuous. It is also used in medicine.

PHOSPHORUS, BALDWIN'S. Recently fused nitrate of calcium. For this purpose it must be broken into fragments whilst still warm, and at once placed in dry and well-stopped phials. After exposure for some time to the direct rays of the sun, it emits sufficient light in the dark to render visible the figures on the dial-plate of a watch.

PHOSPHORUS, BOLOGNIAN. *Syn.* KERCHER'S PHOSPHORUS, BOLOGNIAN STONE. This substance was accidentally discovered by a shoemaker of Bologna, and excited much interest about the middle of the 17th century. The following is said to have been the formula employed by the Logani family, who were particularly successful in its preparation, and acquired wealth by its sale to the curious throughout Europe.

Prep. Reduce recently calcined native sulphate of barium to powder, make it into a paste with mucilage of gum tragacanth, and roll the mass into pieces about ¼ inch thick and 1 to 2 inches long; dry these slowly by a moderate heat, and then expose them to ignition in a wind furnace, by placing them loosely among the charcoal; lastly, allow them to cool slowly, and at once place the pieces in well-stopped phials. Like the preceding substance, it phosphoresces in the dark after exposure to the sun's rays.

PHOSPHORUS, CANTON'S. *Prep.* From calcined oyster shells, 3 parts; flowers of sulphur, 1 part; placed in alternate layers in a covered crucible, and exposed to a strong heat for about an hour. It is preserved and used like the above.

PHOSPHORUS, HOMBERG'S. Recently ignited chloride of calcium.

PHOSPHORUS BOTTLES. *Prep.* 1. Phosphorus, 12 grs.; olive oil, ¼ oz.; mix in an oz. phial, and place the latter, loosely corked, in a basin of hot water; as soon as the phosphorus is melted, remove the phial, cork it securely, and agitate it until nearly cold. On being uncorked, it emits sufficient light in the dark to see the time by a watch, and will retain this property for some years if not too frequently employed. These are frequently called 'luminous phials.'

2. (BRIQUETS PHOSPHORIQUES.)—*a.* From phosphorus, 3 parts; white wax, 1 part; cautiously melted together by the heat of hot water; as the mixture begins to cool, the bottles are turned round, so that it may adhere to the sides.

b. (Bendix.) Cork (rasped small, and dry) and yellow wax, of each, 1 part; phosphorus, 4 parts; petroleum, 8 parts; mixed, by fusion, as the last.

Used as instantaneous-light bottles. A sulphur match rubbed against the composition immediately inflames on exposure to the air. They should be only unstoppered at the instant of introducing the match, and should be handled with caution.

PHOSPHORUS MATCHES. See MATCHES, and *above*.

PHOSPHORUS PASTE. *Syn.* ANTI-ARSENICAL RAT-POISON, PHOSPHOR-PASTE. *Prep.* 1. Phosphorus, 1 oz.; warm water, 1 pint; place them in a bottle, cork it, and agitate them well together, until the phosphorus is reduced to a minute state of division, adding towards the end moist sugar, ½ lb.; next add of lard (melted by a gentle heat), 1 lb., and repeat the agitation until the whole is nearly cold; when cold, form it into a stiff dongh with oatmeal or barley meal, and make this into small balls or cakes; lastly, dry these in the air, without artificial heat.

2. (Simon.) Phosphorus, 8 parts; water (lukewarm), 180 parts; mix in a mortar, and add of rye meal, 180 parts; when cold, further add of butter or lard, 180 parts; sugar, 125 parts; and mix the whole thoroughly together. This is the formula authorised by an ordonnance of the Prussian Government, dated April 27th, 1843.

Obs. Rats, mice, &c., eat the above composition with avidity, after which they soon die. It is said that the best method of using it is to place small pieces of it in and about the holes, with some water in a shallow vessel for them to drink. It has the advantage of retaining its efficacy for many years, and is less dangerous to human beings than compositions containing arsenic, whilst it is even more effective for the purpose for which it is employed. Some persons recommend the addition of a little oil of rhodium or oil of aniseed. See RATS, &c.

PHOS'PHURET. *Syn.* PHOSPHIDE; PHOSPHURETUM, PHOSPHIDUM, L. A compound of phosphorus with a metal or other basic radical. See the respective METALS, &c.

PHOSPHURETTED HY'DROGEN. *Syn.* PHOSPHORETTED HYDROGEN. See HYDROGEN.

PHOTOG'RAPHY. *Syn.* HELIOGRAPHY. The art of producing images on prepared surfaces by means of the actinic or chemical rays of the sun's light. The principal photographic processes now in use are the positive-, negative-, and dry-collodion processes, in each of which a thin film or skin of iodised collodion forms the sensitive surface, a plate of glass being generally used as the foundation of the film

In a positive picture the 'lights' are silvery white by reflected light, and the 'shades' are produced by a 'backing' of black varnish or velvet, showing through the glass plate. In a negative picture the 'lights' are of a dirty yellow or brown by reflection. and being formed by opaque deposits, appear dense black by transmitted light. Negatives are used in the various paper-printing processes; they are placed upon prepared paper and exposed to direct light, which darkens those parts of the paper not protected by the opaque 'lights,' and thus produces positive prints with natural lights and shades. In this way the portrait 'cartes de visite' and other paper photographs are formed. The advantages of the 'dry-collodion process" are, that the plates, when 'sensitised,' will keep for any length of time, and may be 'developed' several days after taking the picture. The principal paper processes are the Talbotype, or calotype, invented in 1839 by Mr. Fox Talbot; the ordinary albumen process, in which pure white of egg is used to give a glossy surface to the paper; and the waxed paper process, in which the paper is waxed before being sensitised. The Daguerreotype process, discovered by M. Daguerre in 1839, has been almost entirely superseded by the easier, healthier, and less expensive collodion process. It consists in submitting a plate of silver or silvered copper to the vapour of iodine and bromine in the dark. A sensitive film of iodide and bromide of silver is thus formed on the plate, which is immediately exposed to the image of an object in the camera obscura. The latent image impressed on the plate is brought out or developed by exposing the plate to the action of the vapour of mercury.

The art of photography cannot be adequately expounded in a work like the present, and we must refer our readers for practical directions to one of the many special treatises on the subject which have been written. The work which contains the greatest amount of information within a moderate compass is Jabez Hughes's 'Principles and Practice of Photography' (Simpkin, Marshall, and Co.), of which no fewer than nine editions have been issued. Besides this excellent little guide to manipulation, the 'Year Book of Photography,' edited for many years past by Geo. Wharton Simpson, M.A. (Piper and Carter), takes cognisance of all the latest improvements introduced into the practice of the art, and furnishes details in the form of an annual report. See CAMERA OBSCURA, COLLODION, &c.

PHOTOM'ETRY. The art of determining the relative intensities of different lights. Various methods have been adopted, at different times, for this purpose, among which, however, a few only are sufficiently simple for general application. The principle adopted by Bouguer and Lambert depends on the fact that, though the eye cannot judge correctly of the proportional force of different lights, it can, generally, distinguish with great precision when two similar surfaces or objects presented together are equally illuminated, or when the shadows of an opaque object produced by different lights are equally dark. Now, as light travels in straight lines, and is equally diffused, it is evident that its intensity will progressively lessen as the distance of its source increases. This diminution is found to be in the duplicate ratio of the distance. To apply this principle to candles, lamps, gas-lights, &c., we have only to arrange two of them so that the light or shadow resulting from both shall be of equal intensity, after which we must carefully measure the distance of each of them from the surface on which the light or shadow falls. The squares of these distances give their relative intensity. In general, some known light, as that from a wax candle (4 to the lb.), is taken as the standard of comparison.

Dr. Ritchie's 'photometer' consists of a rectangular box, about 2 inches square, open at both ends, and blackened inside to absorb extraneous light. In this, inclined at angles of 45° to its axis, are placed two precisely similar rectangular plates of plain silvered glass, and fastened so as to meet at the top, in the middle of a narrow slit about an inch long and the eighth of an inch broad, and which is covered with a strip of tissue or oiled paper. In employing this instrument, the "lights must be placed at such a distance from each other, and from the instrument between them, that the light from each shall fall on the reflector next it, and be reflected to the corresponding portion of the oiled paper. The photometer is then to be moved nearer to the one or the other, until the two portions of the oiled paper corresponding to the two mirrors are equally illuminated, of which the eye can judge with considerable accuracy."

In Prof. Wheatstone's 'PHOTOMETER' the relative intensity of the two lights is determined by the relative brightness of the opposite sides of a revolving silvered ball illuminated by them.

In the method of photometry usually, but erroneously, ascribed to Count Rumford, the shadows of an opaque object formed by different lights, and allowed to fall on a white wall or paper screen, are contrasted. A wire about $\frac{3}{16}$ths of an inch thick, and about a foot in length, with the one end bent so as to form a handle, is commonly used to form the shadows. The method of proceeding is similar to that first above noticed.

It is generally supposed that the equality of two shadows can be appreciated with greater certainty than that of two lights.

PHTHIS'IC. A popular name for difficulty of breathing, from its supposed resemblance to phthisis. See BRONCHITIS, and *below*.

PHYSIC BALLS. See VETERINARY MEDICINES.

PI'CA. Depraved appetite. (See page 128.)

PIC'AMAR. One of the peculiar principles discovered by Reichenbach in beech-tar, and described by him as a viscid, colourless, oily liquid, only feebly odorous, but intensely bitter; insoluble in water; freely soluble in alcohol, ether, and oils; boiling-point 520° Fahr.; sp. gr. 1·095. See KREASOTE.

PICCALIL'LI. See PICKLES.

PICK'LE. The liquor in which substances used as food are preserved. That for flesh is commonly brine; that for vegetables, vinegar; both of which are commonly flavoured with spices, &c.

Prep. 1. (FOR MEAT.)—*a.* From bay salt, 3 lbs.; saltpetre, 2½ oz.; moist sugar, 1 lb.; allspice and black pepper, of each (bruised), 1 oz.; water, 9 pints; simmer them together in a clean covered iron or enamelled vessel for 7 or 8 minutes; when the whole has cooled, remove the scum, and pour it over the articles to be preserved. Used for hams, tongues, beef, &c., to which it imparts a fine red colour and a superior flavour.

b. From bay salt and common salt, of each, 2 lbs.; moist sugar, 1 lb.; saltpetre, ½ lb.; allspice (bruised), ½ oz.; water, 1 gal.; as before. Used chiefly for pork and hams. Common salt may be substituted for bay salt, but it is less powerfully antiseptic, and the flavour is less grateful.

2. (For VEGETABLES.)—*a.* Strong distilled vinegar, to each quart of which 1½ oz. of good salt has been added.

b. Good distilled vinegar, 4 pints; common salt, 2½ oz.; black pepper, ½ oz.; unbleached Jamaica ginger, 2½ oz.; (the last two bruised, but not dusty;) mace (shredded), ¼ oz.; simmer in an enamelled iron or stoneware vessel, as above, and strain through flannel. Sometimes a little capsicum is added. Used either hot or cold, according to the vegetable it is intended to preserve.

Pickle, Lemon. See SAUCES.

PICKLES. These well-known articles are easily prepared of the finest quality. The vegetables and fruit, selected of the proper quality and at the proper season, after being well cleansed with cold spring water, are steeped for some time in strong brine; they are then drained and dried, and transferred to bottles or jars; the spice (if any) is then added, the bottles filled up with hot, strong, pickling vinegar, and at once securely corked down and tied over with bladder. As soon as the bottles are cold, the corks are dipped into melted wax, the more surely to preserve them air-tight. Good wood or distilled vinegar is commonly used for this purpose; but the best malt or white wine vinegar of the strength known as No. 22 or 24 is exclusively employed for the finer pickles which are not spiced. In those for early use the 'steep' may be made in hot or boiling brine, by which the product will be ready for the table in a much shorter period; but with substances of a succulent and flabby nature, as cabbage, cauliflower, some fruit, &c., or in which crispness is esteemed a mark of excellence, this is inadmissible. To such articles the vinegar should also be added cold, or, at furthest, should be only slightly warmed. As a general rule, the softer and more delicate articles do not require so long soaking in brine as the harder and coarser kinds; and they may be often advantageously pickled by simply pouring very strong pickling vinegar over them, without applying heat. It must also be observed that beetroot, and other like substances which are sliced, as well as certain delicate fruits, must not be steeped at all. The spice is commonly added whole to the bottles; but a more economical plan is to steep it (bruised) for some time, or to simmer it in the vinegar before using the latter, as in the forms given under PICKLE (*above*).

The spices and flavouring ingredients employed for pickles are—allspice, black and white pepper, capsicums or red pods, cloves, garlic, ginger, horseradish, lemon peel, mace, mustard, shallots, and turmeric. These are chosen with reference to the particular variety of the pickle, or the taste of the consumer.

In the preparation of pickles it is highly necessary to avoid the use of metallic vessels, as both vinegar and brine rapidly corrode brass, copper, lead, &c., and thus become poisonous (see page 367). These liquids may be best heated or boiled in a stoneware jar by the heat of a water bath or a stove. Common glazed earthenware should be avoided, either for making or keeping the pickles in, as the glazing usually contains lead. Pickles should also be kept from the air as much as possible, and should only be touched with wooden or bone spoons. They are also better prepared in small jars, or bottles, than in large ones, as the more frequent opening of the latter exposes them too much. Copper or verdigris is frequently added to pickles to impart a green colour, or the vinegar is boiled in a copper vessel until sufficiently 'greened' before pouring it on the vegetables. This poisonous addition may be readily detected by any of the tests mentioned at page 367. If a green colour be desired, it may be imparted to the vinegar, and ultimately to the pickles, by steeping vine leaves, or the leaves of parsley or spinach, in it. A teaspoonful of olive oil may be advantageously added to each bottle, to keep the pickles white, and to promote their preservation.

⁂ The following list includes the leading pickles of the shops, and some others:—

Barbarries. From the ripe fruit, without heat.

Beans. From the young green pods of the scarlet bean, and the French or kidney bean, with heat.

Beetroot. From the sliced root, without steeping in brine, and with cold spiced vinegar.

When wanted for immediate use, the vinegar may be used boiling hot.

Brocoli. As CAULIFLOWERS.

Cabbage. This, either red or white, is cut into thin slices, and steeped in strong brine or sprinkled with common salt, and allowed to lie for 1 or 2 days; after which it is drained for 10 or 12 hours in a warm room, and then put into jars or bottles, with or without a little mace and white peppercorns, and at once covered with cold, strong, white vinegar.—Another plan is to steep the sliced cabbage in alum water for 10 or 12 hours, and, after draining and drying it, to pour the vinegar upon it as before. The product of the last formula eats very fresh and crisp, but takes longer to mature than that of the other. Some persons add a little salt with the vinegar; and others mix slices of red beet with the cabbage.

Capsicums. As GHERKINS.

Cauliflowers. As CABBAGE (nearly). Or, they may be steeped in hot brine for 1 or 2 hours before pouring the vinegar over them.

Cherries. From the scarcely ripe fruit, bottled, and covered with strong and colourless pickling vinegar.

Codlins. As BEANS.

Cucumbers. As GHERKINS.

Elderflowers. From the clusters, just before they open, as RED CABBAGE. A beautiful pickle.

English Bamboo. From the young shoots of elder, denuded of the outer skin, pickled in brine for 12 or 14 hours; then bottled with a little white pepper, ginger, mace, and allspice, and pickled with boiling vinegar. Excellent with boiled mutton.

Eschalots. With boiling spiced vinegar, or spices added to each bottle.

French Beans. See *above*.

Garlic. As ESCHALOTS.

Gherkins. From small cucumbers (not too young), steeped for a week in very strong brine; this last is then poured off, heated to the boiling-point, and again poured on the fruit; the next day the gherkins are drained on a sieve, wiped dry, put into bottles or jars with some spice (ginger, pepper, or cayenne), and at once covered with strong pickling vinegar, boiling hot. Several other pickles may be prepared in the same way.

Gooseberries. From the green fruit, as either CABBAGE or CAULIFLOWERS.

Indian Mango. From green peaches. (See *below*.)

Indian Pickle. *Syn.* PICCALILLI. This is a mixed pickle which is characterised by being highly flavoured with curry-powder, or termeric, mustard, and garlic. The following form is commonly used:—Take 1 hard white cabbage (sliced), 2 cauliflowers (pulled to pieces), some French beans, 1 stick of horseradish (sliced), about 2 dozen small white onions, and 1 dozen gherkins; cover them with boiling brine; the next day drain the whole on a sieve, put into a jar, and add, of curry-powder or turmeric, 2 oz.; garlic, ginger, and mustard seed, of each, 1 oz.; capsicums, ½ oz.: fill up the vessel with hot pickling vinegar, bung it up close, and let it stand for a month, with occasional agitation. See MIXED PICKLES (*below*).

Lemons. From the fruit, slit half way down into quarters, and cored, put into a dish, and sprinkled with a little salt; in about a week, the whole is placed in jars or bottles with a little turmeric and capsicums, and covered with hot vinegar.

Limes. As the last.

Mangoes. As LEMONS, adding mustard-seed and a little garlic, with spices at will. ENGLISH MANGOES are made from cucumbers or small melons, split and deprived of their seeds.

Melons. As LEMONS (nearly).

Mixed Pickles. From white cabbage, cauliflowers, French beans, cucumbers, onions, or any other of the ordinary pickling vegetables at will (except red cabbage or walnuts) treated as GHERKINS; with raw ginger, capsicum, mustard seed, and long pepper, for spice, added to each bottle. A little coarsely bruised turmeric improves both the colour and flavour.

Mushrooms. From the small button mushrooms, cleansed with cold spring water, and gently wiped dry with a towel, then placed in bottles, with a blade or two of mace, and covered with the strongest white pickling vinegar, boiling hot.

Myrobalans. The yellow myrobalan preserved in strong brine. Gently aperient.

Nasturtiums. From the unripe or scarcely ripe fruit, simply covered with cold strong vinegar; or, as CABBAGE or GHERKINS.

Onions. From the small button or filbert onion, deprived of the outer coloured skin, and either at once put into bottles and covered with strong white pickling vinegar, or previously steeped for a day or two in strong brine or alum water. When required for early use, the vinegar should be poured on boiling hot.

Peaches. From the scarcely ripe fruit, as GHERKINS.

Peas. As BEANS or CAULIFLOWERS.

Piccalilli. See INDIAN PICKLE.

Radish Pods. As BEANS or GHERKINS.

Samphire. From the perennial samphire (*Erythmum maritimum*), covered with strong vinegar, to each pint of which ¾ oz. of salt has been added, and poured on boiling hot. Said to excite the appetite.

Tomatoes. From the common tomato or love apple, as GHERKINS.

Walnuts. From the young fruit of *Juglans regia*, or common walnut:—1. Steep them in strong brine for a week, then bottle them, add spice, and pour on the vinegar boiling hot.

2. On each pint of the nuts, spread on a dish, sprinkle 1 oz. of common salt; expose them to the sun or a full light for 10 or 12

days, frequently basting them with their own liquor; lastly, bottle them, and pour on the vinegar, boiling hot.

3. (Dr. Kitchener.) Gently simmer the fruit in brine, then expose it on a cloth for a day or two, or until it turns black; next put it into bottles or jars, pour hot spiced vinegar over it, and cork down immediately. In this way the pickle becomes sufficiently mature for the table in half the time required for that prepared by the common method. Dr. Kitchener also recommends this parboiling process for several other pickles. Some persons pierce the fruit with an awl or stocking-needle, in several places, in order to induce early maturation. The spices usually employed are mustard-seed, allspice, and ginger, with a little mace and garlic.

PIC'OLINE. An oily substance, discovered by Dr. Anderson, associated with analine, chinoline, and some other volatile bases, in certain varieties of coal-tar naphtha.

PIC'RIC ACID. $HC_6H_2(NO_2)_3O$. *Syn.* CARBAZOTIC ACID, NITROPHENISIC ACID, TRINITROPHENISIC ACID. A peculiar compound formed by the action of strong nitric acid on indigo, aloes, wool, and several other substances.

Prep. 1. Add, cautiously and gradually, 1 part of powdered indigo to 10 or 12 parts of hot nitric acid of the sp. gr. 1·43; when the reaction has moderated and the scum has fallen, add an additional quantity of nitric acid, and boil the whole until red fumes are no longer evolved; redissolve the crystals of impure picric acid deposited in boiling distilled water, and remove any oily matter found floating on the surface of the solution by means of bibulous paper; a second time redissolve in boiling water the crystals which form as the liquid cools, saturate the new solution with carbonate of potassa, and set it aside to crystallise; the crystals of picrate of potassium thus obtained must be purified by several re-solutions and re-crystallisations, and next decomposed by nitric acid; the crystals deposited as the liquid cools yield pure picrid acid by again dissolving them in boiling water, and re-crystallisation.

2. Dissolve the yellow resin of *Xanthorrhœa hastilis* (Botany Bay Gum) in a sufficiency of strong nitric acid. Red vapours are evolved, accompanied by violent frothing, and a deep red solution is produced, which turns yellow after boiling. Evaporate this solution over a water bath. A yellow crystalline mass is deposited, which consists of picric acid with small quantities of oxalic and nitrobenzoic acids. The picric acid is purified by neutralising the yellow mass with potassa, and crystallising twice out of water. The pure picrate of potassium thus obtained is decomposed by hydrochloric acid, and the liberated picric acid is purified by two crystallisations. This process, devised by Stenhouse, is one of the best, and yields a quantity of the acid amounting to 50% of the resin employed.

Prop., &c. Brilliant yellow scales, scarcely soluble in cold water, but very soluble in boiling water, and in alcohol and ether; fusible; volatile; taste, insupportably bitter, and very permanent. It forms salts with the bases (picrates, carbazotates), mostly possessing a yellow colour, and exploding when heated. The picrate of lead has been proposed as a fulminating powder for percussion caps. The picrate of potassium has been given with advantage in intermittent fevers. A solution of picric acid in alcohol is an excellent test for potassa, if there be not too much water present, as it throws down a yellow crystalline precipitate with that alkali, but forms a very soluble salt with soda. Most of the picrates may be made by the direct solution of the carbonate, hydrate, or oxide of the metal, in a solution of the acid in hot water. The picrate of silver forms beautiful starry groups of acicular crystals, having the colour and lustre of gold.

The principal use of crude picric acid is for dyeing yellow. It is said to be largely employed for the adulteration of beer. It is, however, highly poisonous. According to Prof. Rapp, it acts deleteriously both when swallowed and applied to the unsound skin. Five grains seriously affected a large dog, and killed it within 24 hours. It induces vomiting, feebleness, and general loss of nervous tone. The tissues of animals poisoned by it (even the white of the eye) were tinged of a yellow colour. See PORTER, &c.

PICROTOX'IN. $C_{12}H_{14}O_5$. *Syn.* PICROTOXINE, PICTROTOXIA, PICROTOXINA. A poisonous principle discovered by Boullay in the fruit of *Anamirta paniculata*, or *Cocculus Indicus*.

Prep. 1. Precipitate a decoction of *cocculus Indicus* with a solution of acetate of lead, gently evaporate to dryness, redissolve the residuum in alcohol of ·817, and crystallise by evaporation; repeat the solution and crystallisation a second and a third time. Any adhering colour may be removed by agitating it with a very little water; or by animal charcoal, in the usual manner.

2. (Kane.) Alcoholic extract of *cocculus Indicus* is exhausted with the smallest possible quantity of water, and the mixed liquors filtered; to the filtrate hydrochloric acid is added, and the whole set aside to crystallise. The product may be purified as before.

Prop, &c. It forms small, colourless, stellated needles; soluble in alcohol, ether, and acetic acid, and feebly so in water; boiling water dissolves it freely; taste of solutions, inexpressibly bitter; reaction, neutral. It does not combine with acids, as formerly asserted, but it forms feeble combinations with some of the bases. It is a powerful intoxicant and narcotico-acrid poison. It acts powerfully on the spinal cord and nervous system generally, occasioning an increase of the animal temperature, and peculiar movements, similar to those described by Flourens as resulting from sections of the cerebellum. It is frequently present in malt liquors, owing to their common adulteration with cocculus Indicus.

PIERRE DIVINE. *Syn.* CUPRUM ALUMINATUM. See LAPIS DIVINUS.

PIES. Alexis Soyer gives the following instructions for making pies:—

To make a pie to perfection,—when your paste (half-puff or short) is carefully made, and your dish or form properly full, throw a little flour on your paste-board, take about a ¼ lb. of your paste, which roll with your hand until (say) an inch in circumference; then moisten the rim of your pie-dish, and fix the paste equally on it with your thumb. When you have rolled your paste for the covering, or upper crust, of an equal thickness throughout, and in proportion to the contents of your pie (¼ inch is about the average), fold the cover in two, lay it over one half of your pie, and turn the other half over the remaining part; next press it slightly with your thumb round the rim, cut neatly the rim of the paste, form rather a thick edge, and mark this with a knife about every quarter of an inch apart; observing to hold your knife in a slanting direction, which gives it a neat appearance; lastly, make two small holes on the top, and egg-over the whole with a paste-brush, or else use a little milk or water. Any small portion of paste remaining may be shaped to fanciful designs, and placed as ornaments on the top.

"For meat pies, observe that, if your paste is either too thick or too thin, the covering too narrow or too short, and requires pulling one way or the other, to make it fit, your pie is sure to be imperfect, the covering no longer protecting the contents. It is the same with fruit; and if the paste happens to be rather rich, it pulls the rim of the pie to the dish, soddens the paste, makes it heavy, and, therefore, indigestible as well as unpalatable."

Meat pies require the addition of either cayenne, or black pepper, or allspice; and fruit pies, of enough sugar to sweeten, with mace, ginger, cloves, or lemon peel, according to taste and the substance operated on. See PASTRY, &c.

PIG. The pig or hog (*Sus Scrofa*—Linn.), one of the common pachydermata, is now domesticated in all the temperate climates of the world. Its flesh constitutes pork, bacon, ham, &c.; its fat (lard) is officinal in the Pharmacopœias. The skin, bristles, and even the blood and intestines of this animal, are either eaten as food or turned to some useful purpose in the arts. See PORK, LEATHER, &c.

PIG'MENTS. These are noticed under the *respective colours.*

PIKE. The *Esox Lucius* (Linn.), a freshwater fish. It is remarkable for its voracity, but is highly esteemed by epicures. Various parts of it were formerly used in medicine. The fat (OLEUM LUCII PISCIS) was one of the simples of the Ph. L. of 1618, and was esteemed as a friction in catarrhs. It is even now used in some parts of Europe to disperse opacities of the cornea.

PIL'CHARD. The *Clupea Pilchardus*, a fish closely resembling the common herring, than which, however, it is smaller, but thicker and rounder and more oily. It abounds on the coasts of Devon and Cornwall, where it is not only consumed as food, but pressed for its oil.

PILES. *Syn.* HEMORRHOIDS; HÆMORRHOIDES, L. A painful disease occasioned by the morbid dilatations of the veins at the lower part of the rectum and surrounding the anus.

Piles are principally occasioned by costiveness and cold; and, occasionally, by the use of acrid food. They have been distinguished into—BLIND PILES, or a varicose state of the veins without bleeding,—MUCOUS PILES, when the tumours are excoriated, and mucus or pus is discharged,—BLEEDING PILES, when accompanied with loss of blood, and—EXCRESCENTIAL PILES, when there are loose fleshy excrescences about the verge of the anus and within the rectum.

The treatment of piles consists in the administration of mild aperients, as castor oil, or an electuary of sulphur and cream of tartar. When there is much inflammation or bleeding, cold and astringent lotions, as those of sulphate of zinc or alum, should be applied; and when the pain is considerable, fomentations of decoction of poppy heads may be used with advantage. To arrest the bleeding, ice is also frequently applied, but continued pressure is more certain. When the tumours are large and flaccid, the compound ointment of galls is an excellent application; and if there is a tendency to inflammation, a little liquor of diacetate of lead may be added. In confirmed piles, the internal use of copaiba, or, still better, of the confection of black pepper, should be persevered in for some time, together with local applications. In severe cases the protruded tumours are removed by surgeons by the knife or ligature. See OINTMENTS, ELECTUARIES, &c.

PILL COCHIA. See COMPOUND COLOCYNTH PILLS (*below*).

PILL RUFI. See PILLS OF ALOES WITH MYRRH (*below*).

PILLS. *Syn.* PILULÆ (Ph. E. & D.), PILULA (Ph. L.), L.; PILULES, SACCHAROLÉS SOLIDES, Fr. Pills are little balls, of a semi-solid consistence, composed of various medicinal substances, and intended to be taken whole. The facility with which they are made and administered, their comparatively little taste, their power of preserving their properties for a considerable length of time, and, lastly, their portability and inexpensiveness, have long rendered them the most frequently employed and the most popular form of medicine.

The rapid and skilful preparation of pills from all the numerous substances of which they are composed, is justly considered to demand the highest qualifications in the practical dispenser. · The medicinals employed must be made into a consistent and moderately firm mass, sufficiently plastic to be rolled or moulded into any shape, without adhering to the fingers, knife, or slab, and yet sufficiently solid to retain the globular form when divided into pills. A few substances, as certain extracts, &c., are already in this condition; but the others require the use of an excipient to give them the requisite bulk or consistence. As a general rule, all the constituents of a pill which can be pulverised should be reduced to fine powder, before mixing them with the soft ingredients which enter into its composition; and these last, or the excipient, should next be gradually added, and the mixture triturated and beaten until the whole forms a perfectly homogeneous mass. It is then ready to be divided into pills. This is effected by rolling it on a slab, with a pill or bolus knife, into small pipes or cylinders, then dividing these into pieces of the requisite weight; and, lastly, rolling them between the thumb and finger to give them a globular form. A little powdered liquorice-root or starch is commonly employed to prevent the pills adhering to the fingers, or to each other, after they are made. Magnesia, so frequently used for this purpose, is unsuited for pills containing metallic salts or the alkaloids, or other remedies, which are exhibited in very small doses.

Instead of forming the mass into pills by hand, in the manner just referred to, a convenient and simple instrument, called a 'pill-machine,' is now generally used by the druggists for the purpose. This consists of two pieces. The first (see fig. 1) is divided into three compartments:—*c* is a vacant space to receive the divided mass, which is to be rolled into pills:—*b* is a grooved brass plate, which assists in dividing the mass into pills; and —*a* is a box for containing the powder for covering the pills, and to receive them as they are formed. The second (see fig. 2) consists of a brass plate (*a*), grooved to match the plate *b* in fig. 1, and bounded at both ends by movable projecting plates (*b b*), containing each two wheels under the ledge of the plate (*b*); and a wooden back (*c*), with two handles, (*d d*), to which this plate is affixed. In using this machine, the pill-mass is rolled into a cylindrical form on the front part of it, by means of fig. 2 inverted; the small roll is then laid on the cutting part of the instrument (1, *b*), and divided by passing fig. 2 over it, the little wheels enabling the latter to run easily on the brass plate which forms the margin of the bed of the machine. The pills, thus formed, are then drawn forward on to the smooth bed on which the mass was first rolled, and receiving a finishing turn or two with the smooth side of the "cutter," by which they are rendered more nearly spherical. They are, lastly, thrown over into 1, *c*, ready to be transferred to the pill-box.

Fig. 1.

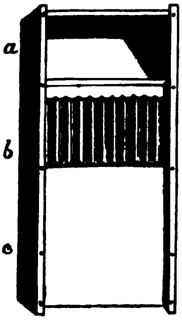
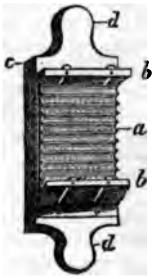


Fig. 2.



The nature of the excipient should be suited to that of the active ingredients in pills, as well as in all other forms of medicine. Soft extracts, and other substances of a like character, may be rendered more consistent by the addition of any simple powder, as that of liquorice or sugar. Vegetable powders are generally beaten up with syrup or treacle, and heavy powders with conserve of roses or extract of liquorice. Castile soap (made of olive oil and soda) and medicinal soft soap (made of olive oil and potash) are commonly employed for fatty and resinous matters, as well as for many others which are not decomposed by alkalies. When the chief ingredient of the mass is resin, rectified spirit is frequently used to soften it, either with or without the addition of soap to increase its solubility in the stomach. For many substances no excipient is required. Thus, most of the gum-resins and stiff extracts may be at once made into pills, or, at all events, after being slightly softened by heat. Mucilage, formerly so much used in the preparation of pills, is now only employed for those which are to be taken within a day or two after being made; as pills containing it become so hard and insoluble when kept for some time, as to resist the action of the stomach, and frequently to pass through the bowels without even losing their form.

It may be further remarked, that no deliquescent salt should enter into the composition of pills not intended for immediate use; and that when efflorescent salts are so employed, they should be first freed from their water of crystallisation.

When the mixed ingredients are made into a mass (pill-mass), which it is not intended at once to divide into pills, it should be preserved in a piece of bladder or gut-skin placed in a covered stoneware or earthenware pot. In this state it may be occasionally moistened with a little weak spirit to prevent its getting hard.

The weight (size) of pills varies from ½ gr. to 6 grs. If heavier than this, they are called 'boluses.' Formerly, as a general rule, they were made of 5 grs. each; but pills of this weight are, in general, so large, that some persons find a difficulty in swallowing them. Another disadvantage of large pills is the trouble of nicely apportioning the dose,—one pill being, perhaps, too small a quantity, and two pills the reverse. Hence, 2 to 3-gr. pills are now the favourite size with both pill-takers and dispensers, notwithstanding that 5-gr. pills are still ordered in one of the authorised Pharmacopœias.

Pills are occasionally coated with gold, silver, and other substances, to render them more agreeable to the eye, or to prevent the taste of nauseous ingredients affecting the palate during deglutition. They are gilded and silvered by placing them, in the moist state, on a leaf or two of the metal in a small gallipot, and covering them in a similar manner with another leaf of metal; over the mouth of the gallipot is laid a piece of smooth writing paper, and on this the palm of the hand; a sudden and rapid circular motion is then given to the whole. If the pills are not sufficiently moist or sticky, they should be rendered so by rolling them between the fingers very slightly moistened with mucilage, before proceeding to silver them. Another method is to shake them in a similar manner with a little gold or silver dust.

When pills are to be covered with gelatin, each pill, being stuck on the point of a very thin wire four or five inches in length, is dipped into a solution of gelatin, so as to coat it completely, and the wire is then inserted into a pincushion, or a vessel containing fine sand, and left until the gelatin is firm, which occurs in about a quarter of an hour; the pins may then be easily removed by simply warming them, by placing the centre of each wire for a second or two in the flame of a spirit lamp or candle. 'Sugar-coated pills' are prepared in nearly the same way, but substituting hot and highly concentrated syrup, to which a little gelatin has been added, for a simple solution of gelatin.

M. Durden covers pills with collodion. Others have recommended for this purpose a solution of gutta percha in either chloroform or bisulphide of carbon. The ready solubility in the stomach of pills thus covered has, with justice, been questioned. Gelatin, or, still better, gelatin mixed with a little sugar, is unexceptionable in this respect; whilst it undoubtedly excludes the taste of nauseous medicines more effectually than any other substance. Mr. Furley employs a thin coating of albumen to render pills tasteless.

As pill-masses are likely to get hard and brittle by keeping, an excellent plan is to keep the dry ingredients powered and mixed together in well-corked bottles or jars, when a portion may at any time be beaten up with syrup, conserve, soap, &c.; according to the formula, and as wanted for use. The mixed ingredients in this state are technically known as 'species' or 'powder for' the respective pills.

"It is generally said that pills should be taken on an empty stomach, and at a considerable distance from a meal; but for ourselves, we think that it is nearly always better to take them during a meal; first, because the stomach does not then find itself immediately under the influence of substances which, if not always dangerous, seldom fail to act more or less disagreeably; secondly, because its absorbent action is more certain; and, lastly, because they are then taken more easily." (Trousseau and Reveil). The meal here referred to should be a light one, from which acidulous and other substances likely to interfere with the action of the remedy should be excluded. The dose should also be increased.

In the London Pharmacopœia the singular number ('pilula') is now very properly employed to express the names of the officinal pill-masses; but in the other Pharmacopœias the names are given in the plural form. As the latter is almost universally adopted in speaking of magistral formulæ and nostrums, we have used it in all cases, for the sake of uniformity and for ease of reference. See BOLUS, EXTRACT, PRESCRIBING, and *below*.

Pills, Abernethy's. See ABERNETHY MEDICINES (page 4).

Pills of Ac'etate of Lead. *Syn.* PILULÆ PLUMBI ACETATIS, L. *Prep.* 1. Acetate of lead, 20 grs.; powdered camphor, 15 grs.; conserve of roses, q. s.; mix and divide into 12 pills.

2. (Radius.) Acetate of lead and powdered mallow or liquorice root, of each, ½ dr.; simple syrup, q. s.; divide into 18 pills.—*Dose.* 1 to 5 daily, washed down with water soured with vinegar; as a powerful astringent in hæmorrhages, diarrhœa, the night-sweats in phthisis, &c. See OPIATED LEAD PILLS.

Pills of Acetate of Mercury. *Syn.* PILULÆ HYDRARGYRI ACETATIS, L. *Prep.* 1. Subacetate of mercury, 18 grs.; sugar of milk (or manna), 1 dr.; mucilage, q. s.; divide into 24 pills.—*Dose.* As an alterative, 1 daily; as a sialogogue, 1 every 4 or 5 hours, or oftener; in syphilis, &c. See KEYSER'S PILLS.

3. (Opiated—Carmichael.) Acetate of mercury, camphor, and opium, of each, 30 grs.; syrup of poppies to mix. For 30 pills. Less apt to affect the stomach and bowels than the last.

Pills of Acetate of Mor'phia. *Syn.* PILULÆ MORPHIÆ ACETATIS, L. *Prep.* 1. Acetate of morphia, 2 grs.; sugar of milk, 15 grs.; conserve of roses, 20 grs.; for 12 pills. Anodyne, sedative, and soporific.—*Dose.* One, as required.

2. (Dr. A. T. Thomson.) Acetate of mer-

phia, 1 gr.; powdered foxglove, 6 grs.; powdered camphor, 10 grs.; powdered gum arabic, 8 grs.; syrup of tolu, q. s.; to be divided into 6 pills. Sedative and antispasmodic.—*Dose.* One, every 3 or 4 hours; in phthisis, palpitations, spasms, &c. The hydrochlorate of morphia may be used instead of the acetate, with advantage.

Pills of Ac′onite. *Syn.* PILULÆ ACONITI, P. EXTRACTI A., L. *Prep.* (Dr. Turnbull). Alcoholic extract of aconite, 1 gr.; liquorice powder, 12 grs.; simple syrup, q. s.; mix, and divide the mass into 6 pills.—*Dose.* One pill, every 3 or 4 hours; as a powerful anodyne and sedative in excessive action of the heart, acute rheumatism, gout, neuralgia, &c. The utmost care should be taken both in their preparation and administration.

Pills, Alibert's. See APERIENT PILLS.

Pills of Al′oes. *Syn.* PILULA ALOËS SOCOTRINÆ (B. P.,) PILULÆ ALOETICÆ, PILULÆ ALOËS (Ph. E.), L. *Prep.* 1. (Ph. E.) Socotrine aloes (in powder) and Castile soap, equal parts; conserve of red roses, q. s. to form a pill-mass.

2. (Ph. U. S.) Powdered aloes and Castile soap, equal parts, beat into a mass, and divided into 4-gr. pills.

Obs. "This pill may be also correctly made with the finer qualities of East Indian aloes, as the (true) Socotrine variety is very scarce; and many, not without reason, prefer (pure) Barbadoes aloes." (Ph. E.) The *dose*, as a laxative, is 5 to 10 grs.; as a purgative, 12 to 20 grs., or more. See PILLS OF ALOES WITH SOAP.

Pills of Aloes and Assafœtida. *Syn.* PILULA ALOËS ET ASSAFŒTIDA (B. P.). *Prep.* Socotrine aloes, in powder, 1; assafœtida, 1; powdered hard soap, 1; confection of roses, 1 (½ confection sufficient.—*Squire*). Mix. Cathartic and antispasmodic.—*Dose.* 5 to 10 grs.

Pills of Aloes (Compound). *Syn.* PILULÆ ALOETICÆ COMPOSITÆ, PILULA ALOËS COMPOSITA (Ph. L.), PILULÆ A. COMPOSITÆ (Ph. D.), L. *Prep.* 1. (Ph. L.) Socotrine aloes (in powder), 1 oz.; extract of gentian, ½ oz.; oil of caraway, 40 drops; treacle, q. s.; the whole to be beaten together until they form a mass proper for making pills.

2. (Ph. D.) Hepatic aloes (in powder), 2 oz.; extract of gentian and treacle, of each, 1 oz.; oil of caraway, 1 fl. dr.; as the last.

Obs. The above is a very valuable purgative in habitual costiveness and indigestion, in all cases in which the use of aloes is not contra-indicated. The *dose* is from 5 to 15 grs., or more.

Pills of Aloes (Diluted). *Syn.* PILULÆ ALOËS DILUTÆ, L. *Prep.* 1. (Dr. Marshall Hall.) Barbadoes aloes, Castile soap, extract of liquorice, and treacle, equal parts; water, q. s.; dissolve, with heat, strain, and evaporate to the consistence of a pill-mass. Resembles the PILULA ALOËS CUM SAPONE—Ph. L.

Pills of Aloes and Assafœti′da. *Syn.* PILULÆ ALOËS ET ASSAFŒTIDA (Ph. E.), L. *Prep.* (Ph. E.) Aloes (Socotrine or East Indian, powdered), assafœtida, and Castile soap, equal parts; beat them with conserve of red roses to a proper pill-mass.—*Dose.* 5 to 10 grs., once or twice daily, as a stomachic tonic and laxative, in dyspepsia, flatulence, &c.; and 12 to 20 grs., as a purgative in similar cases. It is extremely useful in costiveness, with flatulency, occurring in hysterical and hypochondriacal subjects. The B. P. preparation is the same as this, except that hard soap is used instead of Castile soap.

Pills of Aloes and Gin′ger. *Syn.* PILULÆ ALOËS ET ZINGIBERIS, L. *Prep.* (Ph. D. 1826.) Aloes, 1 oz.; Castile soap, ½ oz.; ginger, 1 dr.; oil of peppermint, ½ dr.; beaten to a mass. A useful laxative in cold habits. —*Dose.* As the last.

Pills of Aloes and Ipecac′uanha. *Syn.* DR. BAILLIE'S DINNER PILLS; PILULÆ ALOËS ET IPECACUANHÆ, L. *Prep.* (Dr. Baillie.) Powdered aloes, 30 grs.; powdered ginger (finest), 45 grs.; ipecacuanha, 12 grs.; syrup of orange peel, q. s. to mix. For 24 pills.—*Dose.* One, about an hour before dinner.

Pills of Aloes and I′ron. *Syn.* PILULÆ ALOËS ET FERRI (Ph. E.), L. *Prep.* 1. (B. P.) Barbadoes aloes, 2; sulphate of iron, 1½; compound powder of cinnamon, 3; confection of roses, 4; mix (6 of confection required. *Squire*).—*Dose.* 5 to 10 grs.

2. (Ph. E.) Sulphate of iron, 3 parts; Barbadoes aloes, 2 parts; aromatic powder, 6 parts; conserve of red roses, 8 parts; powder the aloes and sulphate of iron separately, beat the whole to a mass, and divide this into 5-gr. pills. An excellent medicine in chlorosis, hysteria, and atonic amenorrhœa.—*Dose.* 1 to 3 pills daily.

Pills of Aloes and Mas′tic. See DINNER PILLS.

Pills of Aloes and Mer′cury. *Syn.* PILULÆ ALOËS CUM HYDRARGYRO, L. See APERIENT PILLS (8).

Pills of Aloes and Myrrh. *Syn.* RUFUS'S PILLS; PILULA ALOËS CUM MYRRHÂ (Ph. L. & D.), PILULÆ RUFI OR COMMUNES (Ph. L. 1720), P. ALOËS ET MYRRHÆ (B. P., Ph. E.), L. *Prep.* 1. (Ph. L.) Socotrine or hepatic aloes (in powder, ½ oz.; saffron, myrrh (powdered), and soft soap (Ph. L.), of each, 2 drs.; treacle, q. s. to form a pill-mass.

2. (Ph. D.) Hepatic aloes, 2 oz.; myrrh, 1 oz.; dried saffron, ½ oz.; all in powder; treacle, 2½ oz.

3. (Ph. E.) Aloes (Socotrine or East Indian), 4 parts; myrrh, 2 parts; saffron, 1 part; beat them to a pill-mass with conserve of red roses, q. s.

4. (Ph. L. 1836 and Ph. D. 1826). Aloes (in powder), 2 oz.; saffron and powdered myrrh, of each, 1 oz.; syrup, q. s. to form a pill-mass.

5. (B. P.) Socotrine aloes, 2; myrrh, 1; dried saffron, ½; confection of roses, 2½ (3 are

required.—*Squire*). Mix. Stimulant and cathartic. *Dose.* 5 to 10 grs.

Obs. This compound is a most excellent stomachic purgative and emmenagogue, when there are no febrile symptoms present. It is said to have been employed ever since the time of Rhazes, and is still in extensive use. —*Dose.* 10 to 20 grs.

Pills of Aloes and Rhu′barb. *Syn.* PILULÆ ALOËS ET RHEI, P. R. CUM RHEO, L. *Prep.* Powdered Socotrine or hepatic aloes, powdered rhubarb, and soft soap (Ph. L.), of each, ½ dr.; oil of chamomile, 10 drops; for 30 pills. -*Dose.* 1 to 5, either as a stomach tonic or laxative; especially in dyspepsia, with loss of appetite.

Pills of Aloes and Rose-juice. *Syn.* PILULÆ ALOËS ROSATÆ, L.; PILULES ANGELIQUES, GRAINS DE SANTÉ, Fr. *Prep.* Take aloes and rose juice, of each, 4 oz.; juice of borage and chicory, of each, 2 oz.; dissolve with heat, evaporate to an extract; add, of rhubarb, 2 drs.; agaric, 1 dr.; and divide the mass into 1½-gr. pills.--*Dose.* 4 to 12, as a purge.

Pills of Aloes with Soap. *Syn.* PILULA ALOËS CUM SAPONE (Ph. L.), L. *Prep.* (Ph. L.) Powdered extract of Barbadoes aloes, soft soap, and extract of liquorice, equal parts; treacle, q. s. to form a pill-mass.—*Dose.* 10 to 20 grs.; in the usual cases in which aloes is administered. It is more readily soluble in the juices of the primæ viæ, and is milder than most of the aloetic pills without soap. See PILLS OF ALOES (Diluted).

Pills, Al′terative. *Syn.* PILULÆ ALTERANTES, L. See CALOMEL, MERCURIAL, and PLUMMER'S PILLS, &c.

Pills of Al′um. *Syn.* PILULÆ ALUMINIS, P. A. COMPOSITÆ, L. *Prep.* 1. (Augustin.) Alum, 20 grs.; benzoic acid, 6 grs.; powdered gum and white sugar, of each, 10 grs.; water, q. s. to form a mass. For 36 pills. In phthisis and atonic mucous discharges. The whole to be taken in the course of 2 or 3 days.

2. (Capuron.) Catechu, 1 dr.; alum, ½ dr.; opium, 10 grs.; syrup of red roses, q. s.; divide into 5-gr. pills. *Dose.* 1 to 3; in chronic diarrhœa and leucorrhœa.

3. (Radius.) Alum and catechu, equal parts; extract of gentian, q. s. to mix; divide into 2 or 3-gr. pills.- -*Dose.* 2 to 4, every four hours; in passive hæmorrhages, mucous discharges, and chronic diarrhœa.

Pills of Ammoni′acum. *Syn.* PILULÆ AMMONIACI, L. *Prep.* 1. Gum ammoniacum, 1 dr.; powdered sugar, ½ dr.; conserve of hips, q. s. In old coughs and hysterical affections.

2. (Compound.) --*a.* (Ainslie.) Ammoniacum, 1 dr.; mercurial pill, 15 grs.; powdered squills, 6 or 8 grs.; simple syrup, q. s. For 16 pills. In asthmatic coughs, with deranged action of the liver.—*Dose.* One, 2 or 3 times a day.

b. (W. Cooley.) Ammoniacum and sagapenum, of each, 1 dr.; dried sulphate of iron, ¼ *dr.*; conserve of hips, q. s. In obstructed menstruation, and in the chronic diarrhœa of hysterical subjects.

Pills of Ammo″niated Cop′per. *Syn.* PILULÆ CUPRI AMMONIATI (Ph. E.), P. C. AMMONIO-RETI, L. *Prep.* (Ph. E.) Ammoniated copper (in fine powder), 1 part; bread-crumb, 6 parts; solution of carbonate of ammonia, q. s. to make a mass, which is to be divided so that each pill may contain ½ gr. of ammoniated copper. In epilepsy, and in some other spasmodic diseases.--*Dose.* 1 pill, night and morning, gradually increased to 5 or 6.

Pills of Ammoniated I′ron. *Syn.* PILULÆ FERRI AMMONIATI, P. F. AMMONIO-CHLORIDI, L. *Prep.* 1. (Dr. Copland.) Ammoniated iron, 1 dr.; aloes and extract of gentian, of each, ½ dr.; for 30 pills. In scrofula, chlorosis, amenorrhœa, &c.

2. (Radius.) Ammoniated iron and galbanum, of each, 1 dr.; assafœtida, 2 drs.; castor, 20 grs.; tincture of valerian, q. s. For 3-gr. pills.—*Dose.* 2 pills, night and morning; in atonic nervious disorders, epilepsy, &c.

Pills of Ammo″nio-cit′rate of Ir′on. *Syn.* PILULÆ FERRI AMMONIO-CITRATIS, L. *Prep.* (Beral.) Ammonio-citrate of iron, 1 dr.; white sugar, 3 drs.; mucilage, q. s. to mix. For 3-gr. pills.—*Dose.* 1 to 3, or more; as a mild chalybeate tonic.

Pills, Analep′tic. See JAMES'S PILLS, &c.

Pills, Anderson's Scot's. Various formulæ for these pills are extant, the products of which differ widely from the genuine article. Dr. Paris, some years since, declared that they consisted of Barbadoes aloes, jalap, and oil of aniseed. "A careful examination of the proprietary article, with other facts that have come to our knowledge, leads us to believe that the first of the following formulæ is the one now employed in the preparation of the 'Grana Angelica,' or 'Anderson's True Scot's Pills,' of the present day." (Cooley.)

Prep. 1. From Barbadoes aloes, 7 lbs.; jalap (in fine powder), 2¼ lbs.; treacle, ¼ lb.; soap, 6 oz.; melted together by the heat of a water bath, and, when partly cold, aromatised by stirring in of oil of aniseed, 1 oz. The mass is divided into about 3¼-gr. pills, of which 25 or 27 are placed in each 1s. 1½d. box. A mild and useful aperient.—*Dose.* 5 to 15 grs. or more.

2. (Original formula.) Socotrine aloes, 1 oz.; best myrrh, ¼ oz.; saffron, 1 dr.; separately pounded very fine; mix them, in an earthen pipkin, with a spoonful each of water and sweet oil, by the heat of a slow fire, and form the mass into "common-sized pills." From a copy of the original document in the Chapel of the Rolls.

3. (P. Cod.) Aloes and gamboge, of each, 6 drs.; oil of aniseed, 1 dr.; syrup, q. s.; mix, and divide into 4-gr. pills. Much more powerful than the preceding, and closely resembling Morison's 'No. 2 pills.'

4. (Phil. Coll. of Pharm.) Barbadoes aloes (in powder), 3 lbs.; Castile soap, ¼ lb.; calo-

cynth and gamboge (both in fine powder), 2 oz.; oil of aniseed, 1 oz.; beat to a mass with water, q. s., and divide it into 3-gr. pills. Less active than the last, but more so than the 'True Scot's Pills.'

Pills, An'odyne. *Syn.* PILULÆ ANODYNÆ, L. *Prep.* 1. (Hosp. F.) Opium (in powder), 6 grs.; camphor, 15 grs.; conserve of roses, q. s.; divide into 12 pills.—*Dose.* 1 to 3, as required.

2. (A. T. Thomson.) Calomel, potassio-tartrate of antimony, and opium, equal parts; syrup of saffron, q. s.; divided in 3½-gr. pills. In acute rheumatism and neuralgia.—*Dose.* 1 pill, at bedtime.

Pills, Antibil'ious. All the ordinary aperient and stomachic pills may be classed under this head. See the names of their proprietors or reputed inventors, or those of their leading ingredients.

Pills, Antichlorot'ic. *Syn.* PILULÆ ANTICHLORITICÆ, L. *Prep.* 1. (Radius.) Aloes and carbonate of iron, of each, ½ dr.; gum ammoniacum, 1 dr.; extract of taraxacum, q. s. For 3-gr. pills.—*Dose.* 2 to 6, night and morning; in chlorosis, amenorrhœa, &c.

2. (Trousseau & Reveil.) Porphyrised iron filings, 1 dr.; extract of wormwood, q. s. For 36 pills.—*Dose.* 3 or 4; as the last.

Pills, Antimo''nial (Compound). *Syn.* PILULÆ ANTIMONIALIS COMPOSITÆ, P. ANTIMONII CO., L. *Prep.* 1. Antimonial powder, ½ dr.; calomel, camphor, and powdered opium, of each, 6 grs.; conserve of roses, q. s.; divide into 4-gr. pills.—*Dose.* 2, at night; in acute rheumatism, neuralgia, chronic coughs, &c.

2. (St. B. Hosp.) Tartar emetic, 1 gr.; guaiacum and pill of aloes and myrrh, of each, ½ dr.; treacle, to mix. For 16 pills. As the last.

Pills, Antispasmod'ic. *Syn.* PILULÆ ANTISPASMODICÆ, L. *Prep.* (Dr. A. T. Thomson.) Opium, 1 gr.; Russian castor, 13 grs.; powdered digitalis, 2 grs.; syrup, to mix; divide into 4 pills.—*Dose.* 1 or 2, two or three times a day; in spasmodic asthma, difficulty of breathing, &c. Several other formulæ for antispasmodic pills will be found both above and below.

2. (Trousseau & Reveil.) Musk, 15 grs.; extract of valerian, ½ dr.; liquorice powder, q. s. For 20 pills.—*Dose.* 1 every two hours, until there is a marked improvement in the symptoms; in pneumonia, accompanied by delirium, especially in drunkards; in spasms of the uterus, and in various other spasmodic affections.

Pills, Ape''rient. *Syn.* PILULÆ APERIENTES, L. *Prep.* 1. Hepatic aloes, 2 drs.; rhubarb and Castile soap, of each, 1 dr.; scammony, ½ dr.; (all in powder;) essential oil (at will), 10 or 12 drops; beaten to a smooth mass, and divided into pills.

2. Compound extract of colocynth (Ph. L. 1836), 1½ dr.; extract of gentian, ½ dr.; powdered ipecacuanha, 20 grs.; oil of cloves, caraway, or cassia, a few drops. In dyspepsia, loss of appetite, &c.

3. (Abernethy's.) See page 4.

4. (Alibert's.) From calomel, resin of jalap, and Castile soap, of each, 1 dr.; oil of orange peel or citron, 6 or 8 drops. For 60 pills. As an occasional mild purgative, especially in bilious habits and worms.

5. (Sir B. Brodie.) Compound extract of colocynth and mercurial pill, of each, ½ dr.; scammony and Castile soap, of each, 15 grs.; oil of caraway, 6 or 7 drops. For 24 pills. As the last.

6. (W. Cooley.) Aloes, 1½ dr.; jalap and Castile soap, of each, 1 dr.; rhubarb and cardamoms, of each, ½ dr.; (all in powder;) oil of juniper, 12 drops. For 3-gr. pills. A useful mild aperient, for either frequent or occasional use.

7. (Dr. Copland.) Compound extract of colocynth (Ph. L. 1836), 40 grs.; extract of henbane, 30 grs.; Castile soap, 12 grs; ipecacuana, 6 or 7 grs. For two dozen pills.—*Dose.* 2, on retiring to rest. As an aperient in nervous affections and irritable habits.

8. (Harvey.) Mercurial pill and powdered aloes, of each, ½ dr.; ginger, 20 grs. For 24 pills. In constipation, attended with a deficiency of bile.

9. (Dr. Neligan.) Compound colocynth pill and soap of jalap, equal parts; either with or without a few drops of some aromatic essential oil. For 4 or 5-gr. pills. As an aperient for general use.

10. (Sir C. Scudamore.) Compound extract of colocynth, 40 grs.; extract of rhubarb, ½ dr.; scammony and soap, of each, 12 grs.; oil of caraway, 5 or 6 drops. For 20 or 24 pills.

11. (Stahl's; PILULÆ APERIENTES STAHLII, —Ph. Hannov.) Powdered aloes, 1 oz.; compound extract of colocynth, ½ oz.; iron filings, 2 drs.; mucilage, q. s. In amenorrhœa, low habits, and worms.

12. (Vance.) Compound extract of colocynth, 80 grs.; extract of rhubarb, 12 grs.; Castile soap, 6 or 8 grs.; oil of cinnamon, 4 or 5 drops.

Obs. The products of the above formulæ may be divided into pills of any size deemed most agreeable to the patient, and they may be aromatised by the addition of any essential oil at will. The *dose* varies, according to circumstances, from 5 to 10 or 12 grs., or more. Those containing aloes or mercurials are best taken at bedtime. For other formulæ, see the various officinal and other pills containing aloes, colocynth, gamboge, rhubarb, scammony, &c.

Pills, Aromat'ic. *Syn.* PILULÆ AROMATICÆ, L. *Prep.* (Ph. L. 1746.) Compound powder of aloes, 3 oz.; balsam of Peru, ½ oz.; syrup of orange peel, q. s. Aperient, sudorific, and nervine.—*Dose.* 10 to 20 grs.

Pills of Arse''niate of I'ron. *Syn.* PILULÆ FERRI ARSENIATIS, L. *Prep.* (Biett.) Arseniate of iron, 3 grs.; extract of hops, 2 drs.;

powdered mallow-root, ½ dr; syrup, q. s. For 48 pills.—*Dose.* 1 to 2, daily; in cancerous, scrofulous, and herpetic affections. See ARSENICAL PILLS.

Pills of Arseniate of So'da. *Syn.* PILULÆ SODÆ ARSENIATIS, L. *Prep.* (Erasmus Wilson.) Arseniate of soda, 2 grs.; distilled water, the smallest possible quantity to dissolve it; powdered gum guaiacum, ½ dr.; oxysulphuret of antimony, 20 grs.; mucilage, q. s. For 24 pills.—*Dose.* 1 pill, as the last; in herpes, &c. See ARSENICAL PILLS.

Pills, Arsen'ical. *Syn.* ASIATIC PILLS, CARNATIC P., EAST INDIAN P., TANJORE P.; PILULÆ ARSENICI, P. ARSENICALIS, P. ASIATICÆ, P. ACIDI ARSENIOSI, L. *Prep.* (P. Cod.) Arsenious acid, 1 gr.; black pepper (in fine powder), 12 grs.; rub them together for some (considerable) time in an iron mortar, then add, of powdered gum, 2 grs.; water, q. s. to make a mass; which is to be accurately divided into 12 pills. Each pill contains $\frac{1}{12}$ gr. of white arsenic.

Obs. This compound is commonly employed in the East Indies in syphilis, elephantiasis, intermittents, the bites of venomous snakes, &c.; and as a preventive to hydrophobia. The common practice in England is to employ 16 grs. of pepper to 1 gr. of arsenious acid, and to divide the mass into 16 instead of 12 pills. The *dose* is one or two pills daily, taken *after* a meal. The use of all compounds containing arsenic demands great caution.

Pills, Arsenical (Opiated). *Syn.* PILULÆ ARSENICI CUM OPIO, L. *Prep.* (A. T. Thomson.) Arsenious acid, 2 grs.; powdered opium, 8 grs.; Castile soap, 20 grs.; simple syrup, q. s. For 24 pills.—*Dose.* As the last; in intermittents, herpes, lepra, psoriasis, periodical headaches, neuralgia, &c. See *above.*

Pills, Asiat'ic. See ARSENICAL PILLS.

Pills of Assafœt'ida. *Syn.* PILULÆ ASSAFŒTIDÆ (Ph. E. & U. S.), L. *Prep.* 1. (Ph. E.) Assafœtida, galbanum, and myrrh, of each 3 parts; conserve of red roses, 4 parts, or q. s.; mix, and beat them to a proper pill-mass.

2. (Ph. U. S.) Assafœtida, 1¼ oz.; Castile soap, ½ oz.; water, q. s.; divide into 240 pills.

Obs. The above (particularly the last) are stimulant and antispasmodic.—*Dose.* 5 to 10 grs., twice or thrice daily; in hysterical affections, &c. See *below.*

Pills of Assafœtida (Compound). *Syn.* PILULÆ ASSAFŒTIDÆ COMPOSITÆ (B. P., Ph. D.) *Prep.* 1. (Ph. D.) Assafœtida, 2 oz.; galbanum, myrrh, and treacle, of each, 1 oz.; mix in a capsule, by the heat of steam or a water bath, and stir until it becomes a uniform mass. —*Dose, &c.* As the last. The B. P. directs the quantity of galbanum to be double the above.

2. (Hosp. F.) Assafœtida, 1 dr.; soft soap (Ph. L.), 20 grs.; ipecacuanha and squills, of each (in powder), 12 grs.; syrup, q. s.—*Dose.* 5 to 10 grs.; in chronic asthmas, coughs, &c.

Pills of Assafœtida with I'ron. *Syn.* PILULÆ ASSAFŒTIDÆ CUM FERRO, L. *Prep.* (W. Cooley.) Assafœtida, 1 dr.; extract of chamomile, ¼ dr.; mix with a slight heat; add, of dried protosulphate of iron, 15 grs.; oil of cajeput, 10 drops; and divide into 36 pills. In hypochondriasis, hysteria, amenorrhœa, chlorosis, &c., after an aperient.

Pills, Asthma. *Syn.* PILULÆ ANTASTHMATICÆ, L. *Prep.* 1. (Expectorant.) From compound squill pill, 20 grs.; calomel, 5 grs.; powdered opium, 3 grs.; made into 6 pills.—*Dose.* 1 or 2, at bedtime. Expectorant, and sometimes laxative.

2. (Tonic.) From compound iron pill, 2 drs.; extract of gentian, 1 dr.; mix, and divide into 60 pills.—*Dose.* 2, night and morning, with an occasional dose of laxative medicine.

Pills, Astringent. *Syn.* PILULÆ ASTRINGENTES, L. See PILLS OF ACETATE OF LEAD, ALUM, GALLIC ACID, NITRATE OF SILVER, SULPHATE OF IRON, TANNIN, &c.

Pills, Bacher's Ton'ic. *Syn.* PILULÆ TONICÆ BACHERI, L. *Prep.* 1. (Dr. Paris.) Extract of black hellebore and powdered myrrh, of each, 1 oz.; powdered blessed thistle, 3 drs.; mix, and divide into 1-dr. pills.—*Dose.* 2 to 6, three times a day.

2. (P. Cod.) Alkaline extract of hellebore and extract of myrrh, of each, 2 drs.; powdered blessed thistle, 1 dr. For 4-gr. pills. —*Dose.* 1 or 2, as the last. An alterative tonic, hydragogue, and emmenagogue; in debility, dropsy, amenorrhœa, &c. A favourite remedy in some parts of Europe.

Pills, Dr. Baillie's. *Prep.* (Cooley.) Aqueous extract of aloes and compound extract of colocynth, of each, 3 drs.; Castile soap, 1 dr.; oil of cloves, 15 drops. For 4-gr. pills. A good occasional aperient.—*Dose.* 1 to 3, at bedtime, or early in the morning. See DINNER PILLS

Pills, Barbarossa's. These are supposed to have been the first mercurial preparation employed in medicine. They consisted of quicksilver, rhubarb, musk, and amber.

Pills, Rev. D. Barclay's. *Prep.* (Cooley.) Resinous extract of jalap, 1 dr.; almond or Castile soap, 1½ dr.; extract of colocynth, 2 drs. (or powdered colocynth, 3 drs.); gum guaiacum, 3 drs.; potassio-tartrate of antimony, 10 grs.; oil of juniper, 8 or 10 drops; oils of caraway and rosemary, of each, 4 drops; make a mass with syrup of buckthorn (the smallest possible quantity), and divide into 4-gr. pills. A diaphoretic aperient.—*Dose.* 1 to 3, at bedtime.

Pills, Dr. Baron's. *Prep.* From compound rhubarb pill, 30 grs.; compound extract of colocynth, 20 grs.; powdered ipecacuanha, 6 grs. For 3-gr. pills. An excellent stomachic aperient.—*Dose.* 1 to 3 pills, at bedtime; in dyspepsia, loss of appetite, &c.

Pills, Barthez's. *Prep.* From myrrh, 1 dr.; aloes, ½ dr.; musk, 15 grs.; camphor, 12 grs.; balsam of Peru, q. s. to form a mass. For 3½-gr. pills.—*Dose.* 2, thrice daily; in hysteria, amenorrhœa, chlorosis, &c.

Pills, Bath Digestive. *Prep.* (Cooley.) Rhubarb, 2 oz.; ipecacuanha and Castile soap, of each, ½ oz.; capsicum, ginger, and gamboge, of each, ¼ oz.; (all in powder;) syrup of buckthorn, q.s. For 4-gr. pills.—*Dose.* 1, as a dinner pill; 2 or 3 as an aperient.

Pills of Be'beerine. *Syn.* PILULÆ BEBEERINÆ, L. *Prep.* From sulphate of bebeerine, ½ dr.; aromatic confection, q. s.; oil of cajeput, 5 or 6 drops. For 18 pills.—*Dose.* 1 to 3, every four hours; as an antiperiodic, instead of bark or quinine.

Pills, Be'chic. PILULÆ BECHICÆ, L. *Prep.* (Trousseau and Reveil.) Extract of digitalis, 15 grs.; white oxide of antimony, 30 grs.; extract of liquorice, 40 grs.; mix carefully, and divide into 40 pills. Expectorant and sedative.—*Dose.* 2 to 12, or more; in cases of irritating coughs, catarrh of the pulmonary capillaries or bronchia, &c. See COUGH PILLS.

Pills, Beddoe's. *Prep.* From dried (effloresced) carbonate of soda, 1 dr.; soap, 1½ dr.; oil of juniper, 12 drops; syrup of ginger, q. s.; divide into 30 pills. In gravel, stone, &c. —*Dose.* 2 to 5.

Pills of Belladon'na (Compound). *Syn.* PILULÆ BELLADONNÆ COMPOSITÆ, L. *Prep.* 1. (Ainslie.) Extract of belladonna, mercurial pill, and powdered ipecacuanha, equal parts. For 3-gr. pills.—*Dose.* 1, night and morning, in cancerous and glandular affections.

2. (Debreyne.) Camphor and assafœtida, of each, 1 dr.; extract of belladonna, 20 grs.; extract of opium, 5 grs.; syrup, q. s. For 48 pills.—*Dose.* 1 pill, gradually increased to 6, daily. In hysteria, amenorrhœa, &c.

Pills, Belloste's. See MERCURIAL PILLS.

Pills, Bennet's. See FULLER'S PILLS.

Pills of Bichlo''ride of Mercury†. Pills of corrosive sublimate.

Pills of Bichlo''ride of Plat'inum. *Syn.* PILULÆ PLATINI BICHLORIDI, L. *Prep.* (Dr. Hoefer.) Bichloride of platinum, 7½ grs.; extract of guaiacum, 1 dr.; liquorice powder, q. s. For 24 pills.—*Dose.* 1 pill, twice or thrice daily; as an alterative, in syphilis, &c.

Pills, Bicker's. *Prep.* From rust (carbonate) of iron, 2 drs.; aloes, myrrh, and sulphur, of each, 1 dr.; ox-gall, q. s. to mix. For 4-gr. pills.—*Dose.* 1 to 6, morning and evening; in debility, chlorosis, &c.

Pills of Bit'tersweet. *Syn.* PILULÆ DULCAMARÆ, L. *Prep.* (Radius.) Extract of bittersweet (dulcamara), 1 dr.; crude antimony and bittersweet (in powder), of each, ½ dr. For 3-gr. pills.—*Dose.* 6 to 12, twice or thrice a day; in obstinate skin diseases.

Pills, Blaud's. *Syn.* PILULÆ ANTICHLOROTICÆ, L. *Prep.* (Trousseau and Reveil.) Sulphate of protoxide of iron, 2 parts; reduce it to powder, and dry it in a stove at 104° Fahr.; add to this dry carbonate of potassa, 2 parts; honey, 1 part; and form the mass into 50 pills. Tonic and emmenagogue.—*Dose.* 1 to 10, daily; in debility, chlorosis, &c.

Pills, Blue. See MERCURIAL PILLS.

Pills, Bontius's. *Syn.* PILULÆ HYDROGOGÆ, P. H. BONTII, L. *Prep.* (B. Cod.) Socotrine aloes, gamboge, and gum ammoniacum; of each, 1 dr.; white-wine vinegar, 6 drs.; dissolve by heat, at twice, press out the liquor, evaporate to a pilular consistence, and divide into 4-gr. pills.—*Dose.* 1 to 3; as a strong cathartic, in dropsy.

Pills, Brigg's Gout and Rheumatic. This nostrum closely resembles in appearance, odour, and properties, the PLUMMER'S PILL of the Pharmacopœia; the two are probably identical. (Cooley.)

Pill of Bro'mide of I'ron. *Syn.* PILULÆ FERRI BROMIDI, L. *Prep.* (Magendie.) Bromide of iron and powdered gum arabic, of each, 12 grs.; conserve of roses, 20 grs.; mix, and divide into 20 pills. They should be kept in a dry, corked phial. Tonic and alterative.—*Dose.* 1 to 2, night and morning; in debility, especially that of scrofulous habits, in chlorosis, &c.

Pills of Bru'cine. *Syn.* PILULÆ BRUCIÆ, L. *Prep.* (Magendie.) Brucine, 12 grs.; confection of roses, ½ dr.; carefully mixed and divided into 24 pills, which are recommended to be silvered. The quantity of the confection may be advantageously doubled.—*Dose.* 1 pill, night and morning; in the same affections as those for which strychnine is administered. The acetate, hydrochlorate, or sulphate of brucine may be substituted for the alkaloid in the above formula, in a slightly larger quantity.

Pills of Cal'omel. *Syn.* PILULÆ CALOMELANOS, P. E CALOMELANE, P. HYDRARGYRI SUBCHLORIDI, P. H. CLORIDI†, P. H. C. MITIS (Ph. U. S.), L. *Prep.* 1. Calomel, 4 drs.; powdered gum arabic, 1 dr.; simple syrup, q.s.; mix, and divide into 240 pills. Each pill contains 1 gr. of calomel. A convenient form of exhibiting this drug when uncombined with other remedies.—*Dose.* 1 to 5 pills, according to the indication.

2. (U. C. Hosp.) Calomel, 2 drs,; rhubarb, 1½ dr.; confection of senna, q. s. For 4 dozen pills. An excellent alterative aperient, especially in hepatic affections.

Pills of Calomel (Compound). *Syn.* PLUMMER'S PILLS, RED P.; PILULA HYDRARGYRI SUBCHLORIDI COMPOSITA, PILULÆ CALOMELANOS COMPOSITÆ (Ph. E. & D.), PILULÆ PLUMMERI, PILULA HYDRARGYRI CHLORIDI COMPOSITA (Ph. L.). *Prep.* 1. (Ph. L.), L. Chloride of mercury (calomel) and oxysulphide of antimony, of each, 2 drs.; rub them together, add of guaiacum (in powder) and treacle, of each, 4 drs., and form the whole into a pill-mass.

2. (Ph. E.) Calomel and golden sulphide of antimony, of each, 1 part; guaiacum (in powder) and treacle, of each, 2 parts; beat the whole to a pill-mass, and divide it into 6-gr. pills.

3. (Ph. D.) Calomel and precipitated sulphide of antimony, of each 1 dr.; triturate them together, then add, of guaiacum resin (in

powder), 2 drs.; castor oil, 1 fl. dr.; and beat the whole to a uniform mass.

4. (B. P.) Calomel, 1; sulphurated antimony, 1; guaiac resin (in powder), 2; castor oil, 1; mix.—*Dose.* 5 to 10 grs.

Obs. An excellent alterative pill; very useful in lepra, in secondary syphilis affecting the skin, and in various other chronic cutaneous diseases; also in dyspepsia and liver complaints.—*Dose.* 3 to 10 grs., night and morning.

Pills of Calomel and Opium. *Syn.* PILULÆ CALOMELANOS ET OPII (Ph. E.), L. *Prep.* (Ph. E.) Calomel, 3 parts; opium, 1 part; conserve of red roses, q. s.; divide the mass so that each pill may contain 2 grs. of calomel. —*Dose.* 1 or 2 pills, in rheumatism, facial neuralgia, and various inflammatory affections. They offer a convenient form for gradually introducing mercury into the system, and, if continued, induce salivation.

Pills of Cam'phor. *Syn.* PILULÆ CAMPHORÆ, P. CAMPHORATÆ, L. *Prep.* Camphor and sugar, of each (in powder), 2 parts; conserve of hips, 1 part. For 3-gr. pills. Anaphrodisiac, sedative, diaphoretic, and nervine.—*Dose.* 1 to 5, twice or thrice a day.

Pills of Camphor (Compound). *Syn.* PILULÆ CAMPHORÆ COMPOSITÆ, P. CAMPHORATÆ C., L. *Prep.* 1. (Dupuytren.) Camphor, 24 grs.; pure musk, 8 grs.; opium, 2 grs.; syrup, q. s.; divide into 12 pills.—*Dose.* 1 to 4, three or four times daily; in putrescent sores, hospital gangrene, &c.

2. (Fr. Hosp.) Gum ammoniacum, 40 grs.; camphor, 30 grs.; musk, 10 grs.; opium, 5 grs.; tincture of valerian, q. s.; divide into 4-gr. pills.—*Dose.* 2 to 6 pills daily; in nervous and hysterical affections, &c.

3. (Ricord.) Camphor and lactucarium (or extract of lettuce), equal parts; divide into 4-gr. pills.—*Dose.* 3 to 6 pills daily; as an anaphrodisiac.

4. (U. C. Hosp.) Camphor, 20 grs.; assafœtida, 1 dr.; extract of valerian, 2 drs. For 30 pills. As No. 2.

Pills of Canthar'ides. *Syn.* PILULÆ CANTHARIDIS, P. C. COMPOSITÆ, L. *Prep.* 1. Cantharides (in very fine powder), 8 grs.; extract of gentian, ½ dr.; liquorice powder, 10 grs. For 12 pills.—*Dose.* 1 to 4 daily; as a diuretic, emmenagogue, &c.

2. (Ellis.) Cantharides (in very fine powder), 18 grs.; opium and camphor, 36 grs.; mix, and divide into 36 pills.—*Dose.* 1 pill, at bedtime; as an aphrodisiac, in parties labouring under general debility. They should be used with extreme caution, and but seldom.

Pills of Caout'chouc. *Syn.* PILULÆ GUMMI ELASTICI, L. *Prep.* (Bouis.) India rubber, cut into small squares or spheres, then moistened with syrup of tolu, and, lastly, shaken in a box with a mixture of powdered gum and sugar. In phthisis.—*Dose.* 1 pill, three or four times a day. They pass through the primæ viæ unaltered, and may therefore fairly be presumed to be inert.

Pills of Cap'sicum. *Syn.* CAYENNE PEPPER PILLS; PILULÆ CAPSICI, L. *Prep.* 1. (Guy's Hosp.) Capsicum, 1 part; rhubarb, 2 parts; (both in powder;) treacle, q. s.; mix, and divide into 3½-gr. pills.—*Dose.* 1 to 3, an hour before dinner; to create an appetite and promote digestion.

2. (Radius.) Powdered capsicum, 20 grs.; extract of gentian, 1 dr.; powdered gentian, q. s. to form a mass. For 60 pills.—*Dose.* 2 to 4 pills, thrice daily; in chronic dyspepsia, especially in the loss of tone of the stomach arising from intemperance.

Pills of Car'bonate of I'ron. *Syn.* VALLET'S PILLS; PILULÆ FERRI CARBONATIS (Ph. E.), L. *Prep.* (B. P., Ph. E.) Saccharated carbonate of iron, 4 parts; conserve of red roses, 1 part; mix, and divide the mass into 5-gr. pills.—*Dose.* 1 to 3, or more; as a mild chalybeate and antichlorotic. 5 to 20 grs., B.P. For another formula, see BLAUD'S PILLS (*above*).

Pills, Catarrh'. *Syn.* PILULÆ ANTICATARRHALES, L. *Prep.* 1. (Trousseau and Reveil.) Turpentine, 4 drs.; ammoniacum, 1 dr.; balsam of tolu, ½ dr.; aqueous extract of opium, 6 grs.; liquorice powder, q. s.; mix, and divide into 80 pills.—*Dose.* 5 or 6 daily; in chronic catarrh of the bronchi and bladder.

2. (Trousseau & Reveil.) Alcoholic extract of aconite, 30 grs.; sulphuret of calcium, 15 grs.; powdered sugar, q. s. For 24 pills.—*Dose.* 1 pill, three or four times daily; in chronic pulmonary catarrh.

Pills, Cathar'tic. *Syn.* PILULÆ CATHARTICÆ, L. *Prep.* 1. (Dr. Collier.) Calomel, 10 grs.; powdered jalap and prepared chalk, of each, ½ dr.; oil of caraway, 10 drops; syrup of buckthorn, to mix; divide into 5-gr. pills. —*Dose.* 1 to 4.

2. (Dr. A. T. Thomson.) Scammony, 4 grs.; extract of taraxacum, 16 grs.; divide into 6 pills.—*Dose.* 3 pills, twice daily; in hypochondriasis and chronic inflammation of the liver.

3. (A. T. Thomson.) Calomel, 15 grs.; powdered jalap, 45 grs.; mucilage, q. s. to mix. For 18 pills.—*Dose.* 1 to 3, at night, to empty the bowels, in bilious affections. Other formulæ for cathartic pills will be found both *above* and *below*.

Pills, Cathartic (Compound). *Syn.* PILULÆ CATHARTICÆ COMPOSITÆ, L. *Prep.* (Ph. U. S.) Compound extract of colocynth, 4 drs.; powdered extract of jalap and calomel, of each 3 drs.; powdered gamboge, 40 grs.; water, q. s.; mix, and divide into 180 pills. An excellent purgative, especially in bilious affections, dyspepsia, &c.—*Dose.* 1 to 3 pills.

Pills, Chamberlain's Restor'ative. A nostrum composed of cinnabar and milk of sulphur, equal parts; beaten up with conserve of hips.

Pills of Cham'omile. *Syn.* PILULÆ ANTHEMIDIS, P. FLORUM CHAMÆMELI, L. *Prep.* Extract of gentian, 1 dr.; powdered aloes, ½ dr.; powdered rhubarb, 20 grs.; oil of chamomile, 10 drops. A tonic and stomachic aperient.—*Dose.* 5 to 15 grs. This forms the 'chamomile pills' of the shops. They should be kept in a corked phial. See *below.*

Pills of Chamomile (Compound). *Syn.* PILULÆ ANTHEMIDIS COMPOSITÆ, L. *Prep.* 1. (Ainslie.) Extract of chamomile, 1 dr.; assafœtida, ½ dr.; powdered rhubarb, 20 grs.; divided into 30 or, better, 36 pills.—*Dose.* 1, as a dinner pill; or 2 to 3, twice a day, in flatulent dyspepsia.

2. (Beasley.) Aqueous extract of aloes, 12 grs.; extract of chamomile, 36 grs.; oil of chamomile, 3 drops. For 12 pills.—*Dose.* 2, at night, or twice a day; in dyspepsia, loss of appetite, &c. See NORTON'S PILLS.

Pills, Chapman's. *Prep.* Mastic, 12 grs.; aloes, 16 grs.; rhubarb, 24 grs. For 12 pills. An excellent stomachic aperient.—*Dose.* 2 to 4.

Pills of Chiray'ta. *Syn.* DR. REECE'S PILLS; PILULÆ CHIRAYTÆ, L. *Prep.* From chirayta, 2 drs.; dried carbonate of soda, 20 grs.; powdered ginger (best), 15 grs.; divided into 36 pills.—*Dose.* 2, twice a day. In acidity, flatulence, and dyspepsia, especially when complicated with gout or debility.

Pills of Chlo''ride of Ba''rium. *Syn.* PILULÆ BARII CHLORIDI, L. *Prep.* 1. (Pierquin.) Chloride of barium, 1 dr.; resin of guaiacum, 4 drs.; conserve of fumitory, q. s.; divided into 188 pills.—*Dose.* 1 pill, morning and evening, afterwards increased to 2; in tapeworm, and in the rheumatism of scrofulous subjects.

2. (Walsh.) Chloride of barium, 15 grs.; powdered marsh-mallow or liquorice root and mucilage of tragacanth, of each, q. s. to make 200 pills.—*Dose.* 3, gradually increased to 10 or 12, daily; in cancer, scrofula, goitre, syphilis, &c.

Obs. The above are very poisonous, and their exhibition demands great caution.

Pills of Chloride of Cal'cium. *Syn.* PILULÆ CALCII CHLORIDI, L. *Prep.* 1. As the last.

2. (Gräfe.) Chloride of calcium, 1 dr.; extract of opium, 10 grs.; mucilage, q. s. For 54 pills.—*Dose.* 1, every two or three hours, gradually increased until 10, or even 12, are taken every hour; in gonorrhœa, more especially when occurring in scrofulous subjects.

Pills of Chloride of Gold. *Syn.* PILULÆ AURI CHLORIDI, L. *Prep.* From terchloride of gold, 3 grs.; powdered liquorice, 1 dr.; syrup, q. s. For 48 pills.—*Dose.* 1 pill, twice or thrice daily. (See page 581.)

Pills of Chloride of Gold and So'dium. *Syn.* PILULÆ AURI ET SODI CHLORIDI, P. A. SODIO-CHLORIDI, L. *Prep.* (Magendie.) Soda-chloride of gold, 1 gr.; extract of mezereon, 2 drs.; divide into 60 pills. (See page 581.)

Pills of Chloride of Lime. *Syn.* PILLS OF CHLORINATED LIME; PILULÆ CALCIS HYPOCHLORITIS, L. *Prep.* 1. Chloride of lime, 12 grs.; starch powder, 24 grs.; conserve of hips, q. s.; divide into 36 pills.

2. (Dr. Copland.) Chloride of lime, 15 grs.; compound powder of tragacanth, 90 grs.; syrup, q. s. For 24 pills.—*Dose.* 1 to 3, twice or thrice daily; in various putrid affections, fevers, &c.

Pills of Chloride of Mercury†. Pills of calomel.

Pills, Chol'era. *Syn.* PILULÆ ANTICHOLERICÆ, L. *Prep.* Powdered camphor, 15 grs.; powdered capsicum (pure), ½ dr.; bicarbonate of soda, 1 dr.; conserve of roses, q. s. For 36 pills.—*Dose.* 2 to 4, every 15 minutes, washed down with a wine-glassful of cold water containing half a teaspoonful of ether; repeated every 15 or 20 minutes, until reaction ensues. They should be freshly made.

Pills of Cit'rate of I'ron and Quinine'. *Syn.* PILULÆ FERRI CITRATIS CUM QUINÂ, L. *Prep.* From citrate of iron and quinine, 1 dr.; powdered citric acid, 20 grs.; conserve of hips, q. s. For 36 pills. An excellent tonic in debility, chlorosis, &c.—*Dose.* 1 to 3, twice or thrice daily.

Pills, Dr. Clark's. See DINNER PILLS.

Pills, Coindet's. See PILLS OF IODIDE OF MERCURY.

Pills of Col'chicum. See GOUT PILLS.

Pills of Col'ocynth. *Syn.* PILULÆ È DUOBUS, P. EX COLOCYNTHIDE SIMPLICIORES, L. *Prep.* (Ph. L. 1746.) Colocynth and scammony, of each, 2 oz.; oil of cloves, 2 drs.; syrup of buckthorn, q. s. An active hydragogue cathartic. —*Dose.* 3 to 12 grs.

Pills of Colocynth (Compound). *Syn.* PILL OF COCHIA; PILULÆ COCCIÆ, P. COCHIÆ, PILULA COLOCYNTHIDIS COMPOSITA (B. P.), P. COLOCYNTHIDIS COMPOSITÆ (Ph. L. & D.), P. COLOCYNTHIDIS (Ph. E.), L. *Prep.* 1. (Ph. L.) Extract of colocynth (simple), 1 dr.; powdered extract of aloes, 6 drs.; powdered scammony, 2 drs.; powdered cardamoms, ½ dr.; soft soap (Ph. L.), 1½ dr.; mix, and beat them altogether, so that a mass may be formed. This is intended as a substitute for the compound extract of colocynth of the Ph. L. 1836.

2. (Ph. E.) Socotrine or East Indian aloes and scammony, of each, 8 parts; sulphate of potassa, 1 part; beat them together; add of colocynth, in fine powder, 4 parts; next add of oil of cloves, 1 part; and, with the aid of a little rectified spirit, beat the whole to a mass, and divide this into 5-gr. pills.

3. (Ph. D.) Colocynth pulp, scammony, and Castile soap, of each (in powder), 1 oz.; hepatic aloes, 2 oz.; treacle, 10 drs.; oil of cloves, 1 fl. dr.; mix, and beat them into a mass of uniform consistence.

4. (Ph. L. 1746.) Socotrine aloes and scammony, of each, 2 oz.; pulp of colocynth, 1 oz.; oil of cloves, 2 drs.; syrup of buckthorn, q. s. to form a pill-mass. This is the original formulæ published by Galen for 'pilulæ cochiæ minores,' and, under various slight modifications, it has continued in use ever since.

5. Aloes, 1½ lb.; colocynth, ¾ lb.; jalap, 6

Obs. Compound colocynth pill is a cheap and excellent cathartic, more powerful than the other officinal aloetic pills, and well adapted to cases of habitual costiveness. It has long been extensively used by the poorer classes, and in domestic medicine generally.—*Dose.* 5 to 15 grs.

Pills of Colocynth and Hen'bane. *Syn.* PILULÆ COLOCYNTHIDIS ET HYOSCYAMI (B. P., Ph. E.), L. *Prep.* 1. (Ph. E.) Colocynth pill-mass, 2 parts; extract of henbane, 1 part; beat them up with a few drops of rectified spirit (if necessary), and divide them into 5-gr. pills.—*Dose.* 1 to 3 pills; as an anodyne purgative, in irritable bowels.

2. (B. P.) Colocynth, in powder, 1; Barbadoes aloes, in powder, 2; scammony, in powder, 2; sulphate of potash, in powder, ¼; oil of cloves, ¼; extract of hyoscyamus, 3; distilled water, a sufficiency: mix.—*Dose.* 5 to 10 grains.

Pills of Copai'ba. *Syn.* PILULÆ COPAIBÆ, L. *Prep.* (Ph. U. S.) Pure balsam of copaiba, 2 oz.; recently prepared calcined magnesia, 1 dr.; mix thoroughly, then set the mixture aside until it acquires a pillular consistence, and, lastly, divide it into 200 pills.

Obs. Unless the magnesia has been very recently calcined, the copaiba hardens very slowly or not at all. It is said that "lime produces the effect more completely and uniformly than magnesia," and that "specimens of copaiba which are old and contain the most resin" harden quickest. (Redwood.) For present use, the quantity of magnesia may be at least doubled. Dr. Pereira orders copaiba, 1 oz.; magnesia, 5 or 6 drs.—*Dose.* 10 to 30 grs., frequently; in diseases of the mucous membranes of the urinary organs. Cubebs are often added.

Pills, Dr. Copland's. See APERIENT and

q. s. to form a mass. For 120
taining ⅛ gr.

Obs. The above formulæ are
most usually employed. Oth
order pills containing $\frac{1}{16}$th of
orders $\frac{1}{20}$ gr., and Hüfeland only
pill. The commencing dose sho
1 pill containing the $\frac{1}{12}$ of a g
thrice a day. It may afterw
kept at ⅛th of a grain. They
ployed in syphilis, but are als
exhibited with great advantage
indurations and enlargements, a
due caution being observed.

Pills, Cough. See PECTORAL
TORANT P., &c.

Pills of Cre'asote. *Syn.* PILU
L. *Prep.* 1. (Pitschaft.) Cre
powdered henbane, 24 grs.; con
q. s. For 24 pills.—*Dose.* 1,
daily; in sea-sickness, the vo
pregnancy, &c.

2. (Rieche.) Creasote, 1 d
liquorice and gum galbanum, o
powdered mallow-root, 2 drs.;
into 2-gr. pills.—*Dose.* 3 to 6
day; in acute rheumatism, br
ralgia, phthisis, &c.

Pills, Crespigny's. See DINN

Pills of Cro'ton Oil. *Syn.* PILU
P. TIGLII, L. *Prep.* 1. Croto
oil of cloves, 4 drops; bread-cru
3 pills, one of which is a dose.

2. (Dr. Copland.) Croton
pill of aloes and myrrh, 1½ dr.;
liquorice powder, q. s. For 30
2 to 4.

3. (Dr. Reece.) Croton oil, 6
soap, ½ dr.; oil of caraway, 8 dr
powder, q. s. For 12 pills.—
In dropsy, visceral obstructio

Pills of Cyanide of Potas'sium. *Syn.* PILULÆ POTASSII CYANIDI, L. *Prep.* (Golding Bird.) Cyanide of potassium, 2 grs.; arrowroot, 20 grs.; simple syrup, q. s. For 18 pills. —*Dose.* 1, twice or thrice a day; as a sedative, in hysteria, gastrodynia, extreme nervous excitability, &c. See DRAUGHT and MIXTURE.

Pills of Dandeli'on. See PILLS OF TARAXACUM.

Pills, De Haen's. *Prep.* (St. Marie.) Gum ammoniacum and pill aloes with myrrh, of each, 1 dr.; extract of hemlock and Castile soap, of each, 1½ dr. For 2-gr. pills.—*Dose.* 3 to 6 daily; in painful or obstructed menstruation, chlorosis, &c.

Pills of Del'phine. *Syn.* PILULÆ DELPHINIÆ, L. *Prep.* (Dr. Turnbull.) Delphine, 1 gr.; extracts of henbane and liquorice, of each, 12 grs. For 12 pills.—*Dose.* 1 to 3, twice a day; in dropsy, gout, rheumatism, &c., instead of veratrine.

Pills, Diaphoret'ic. *Syn.* PILULÆ DIAPHORETICÆ, L. *Prep.* 1. Antimonial powder, ½ dr.; opium, 10 grs.; calomel, 5 grs.; confection of opium, q. s. to mix; divide into 10 pills.—*Dose.* 1, at bedtime; in coughs and bronchial irritability, after an aperient.

2. Guaiacum, 10 grs.; emetic tartar and opium, of each, 1 gr.; simple syrup, q. s. to mix; divide into 3 pills.—*Dose.* 1 to 2, in acute rheumatism, &c.

3. Camphor and antimonial powder, of each, ½ dr.; opium, 10 grs.; aromatic confection, q. s. to mix. For 12 pills. In fevers, and in some spasmodic diseases.—*Dose.* 1 pill.

4. Powdered guaiacum, 10 grs.; compound powder of ipecacuanha, 5 grs.; confection of roses, q. s. to mix; for a dose. As a diaphoretic, in inflammatory affections and rheumatism.

Pills, Diarrhœ'a. *Syn.* PILULÆ ANTIDIARRHŒALES, L. *Prep.* (Trousseau & Reveil.) Soft extract of opium, 1½ gr.; calomel and powdered ipecacuanha, of each, 3 grs.; conserve of hips, q. s.; divide into 10 pills.—*Dose.* 1, two or three times daily; in chronic and choleraic diarrhœa.

Pills, Diges'tive. Under this head are generally classed all the stomachic and milder aperient pills. See BATH PILLS, DINNER, PILLS, &c.

Pills of Digita'line. *Syn.* PILULÆ DIGITALINÆ, L. *Prep.* 1. Digitaline, 1 gr.; powdered sugar, ½ dr.; thick mucilage, q. s. For 24 pills.—*Dose.* 1 to 4 daily, watching the effects; as a sedative to reduce the force of the circulation, in phthisis, enlargement of the heart, &c. See FOXGLOVE PILLS.

Pills, Din'ner. *Syn.* PILULÆ DICTÆ ANTE-CIBUM, L.; GRAINS DE SANTÉ, Fr. *Prep.* 1. Aloes, 1 dr.; rhubarb and extract of gentian, of each, ½ dr.; ipecacuanha and capsicum, of each, 12 grs.; syrup of ginger, q. s. to mix. For 3½-gr. pills.

2. (Dr. Baillie's.) See page 922.

3. (BATH DIGESTIVE PILLS.) See page 923.

4. (PILLS OF ALOES AND MASTIC; LADY CRESPIGNY'S PILLS, LADY HESKETH'S P., LADY WEBSTER'S P., DIGESTIVE P., STOMACH P., PILULÆ ALOËS ET MASTICHES, P. A. CUM MASTICHE, P: STOMACHICÆ MESUES; GRAINS DE VIE, GRAINS DE MESUE.) From aloes (powdered), 6 drs.; powdered mastic and petals of red roses, of each, 2 drs.; syrup of wormwood, q. s. to form a pill-mass. For 3-gr. pills. In small doses, they excite the appetite; in larger ones, they produce a bulky and copious evacuation. This is the formula of the old Paris Codex. Rhubarb is now frequently substituted for the rose petals.

5. (Sir C. Bell's.) From sulphate of quinine, 4 grs.; mastic, 6 grs.; rhubarb, 50 grs.; syrup of orange peel, q. s. to mix. For 12 or, preferably, 18 pills.

6. (Sir Chas. Clarke's.) From extract of chamomile, ½ dr.; myrrh and rhubarb (in powder), of each, 20 grs.; powdered Socotrine aloes, 10 grs.; oil of chamomile, 8 drops; mucilage, q. s. to form 20 pills. "These pills, which were originally prescribed by Sir Chas. Clarke, are much used in London." (Redwood.)

7. (Frank's.) From aloes and jalap, of each, 4 parts; rhubarb, 1 part; syrup of wormwood, q. s. For 3-gr. pills.

8. (P. Cod.) Aloes, 6 drs.; extract of cinchona bark, 3 drs.; cinnamon, 1 dr.; syrup of wormwood, q. s.

The *dose* of the above is 3 to 5 grs., about an hour before dinner, to promote the appetite; or, as a purgative, 10 to 15 grs.

Pills, Diuret'ic. *Syn.* PILULÆ DIURETICÆ, L. *Prep.* 1. From powdered foxglove, 12 grs.; calomel, powdered squills, and opium, of each, 4 grs.; conserve of hips, q. s. For 12 pills.

2. (Dr. A. T. Thomson.) Mercurial pill, 1 dr.; powdered squills, 20 grs.; confection of roses, q. s.; divided into 20 pills. The *dose* of either of the above is 1 pill, twice or thrice daily; in dropsy, &c.

Pills, Dixon's. According to Dr. Paris, these pills consist of aloes, scammony, rhubarb, and a little tartar emetic, beaten up with syrup. "The following formula produces a pill precisely similar to this nostrum:—Take of compound extract of colocynth (Ph. L. 1836), 4 drs.; powdered rhubarb, 2 drs.; potassio-tartrate of antimony, 8 grs.; syrup of buckthorn, q. s.; mix, and divide into 120 pills. Aperient and diaphoretic.—*Dose.* 2 or 3, at bedtime." (Cooley). Although a nostrum, it is really an excellent medicine, adapted for numerous cases.

Pills, Duchesne's. *Prep.* From aloes and gum ammoniacum, of each, 30 grs.; mastic and myrrh, 10 grs.; carbonate of potassa and saffron, of each, 3 grs.; syrup, q. s. In the dyspepsia of hysterical patients, in engorgements of the abdominal viscera, following intermittent fevers, &c.

Pills, Dys'entery. *Syn.* PILULÆ DYSENTERICÆ, L. *Prep.* Pure alumina and tannic acid, of each, 20 grs.; antimonial powder, 15 grs.; castor oil, ½ dr.—*Dose.* 5 to 10 grs.; frequently.

Pills of Elate'rium. *Syn.* PILULÆ ELATERII, L. *Prep.* (Radius.) Elaterium, 6 grs.; extract of gentian and Castile soap, of each, 9 grs.; mix, and divide into 12 pills.—*Dose.* 1 to 4; in obstinate constipation, and as a purge in dropsy, &c.

Pills, Emet'ic. *Syn.* PILULÆ EMETICÆ, P. CUPRI SULPHATIS COMPOSITÆ, L. *Prep.* (Swediaur.) Sulphate of copper and ipecacuanha, equal parts; syrup or conserve of roses, q. s. For 5-gr. pills.—*Dose.* 1 pill, repeated every 15 minutes, until vomiting comes on. See EMETICS.

Pills, Epilep'sy. *Syn.* PILULÆ ANTEPILEPTICÆ, P. AD EPILEPSIAM, L. *Prep.* 1. (Griffith.) Powdered indigo, 75 grs.; assafœtida, 15 grs.; Russian castor, 7 grs.; mix, and divide the mass into 20 pills.—*Dose.* 1, every hour.

2. (Récamier.) Oxide of iron, 9 grs.; camphor and extract of belladonna, of each, 6 grs. For 12 pills.—*Dose.* 1 to 3, every 3 or 4 hours.

Pills of Er'got of Rye. *Syn.* PILULÆ ERGOTÆ, P. SECALIS CORNUTI, L. *Prep.* 1. (Dewees.) Powdered ergot, ½ dr.; extract of gentian, 1 dr.; divide into 15 pills. In obstructed and painful menstruation, hæmorrhages, &c.—*Dose.* 1 pill, thrice daily.

2. (Lallemande.) Aloes, ergot, and rue, of each, 8 grs.; for 12 pills. As the last.

Pills of Er'gotine. *Syn.* PILULÆ ERGOTINÆ, L. *Prep.* (Bonjean). Ergotine (Bonjean's), 24 grs.; liquorice powder, 40 grs.; syrup, q. s. For 24 pills.—*Dose.* 3 to 6, daily; as an internal hæmostatic, &c.

Pills, Everlast'ing. *Syn.* PERPETUAL PILLS; PILULÆ ÆTERNÆ, P. PERPETUÆ, L. Small spheres of metallic antimony. They possess the property of purging as often as swallowed, but have now long fallen into disuse.

Pills, Expec'torant. *Syn.* PILULÆ EXPECTORANTES, L. *Prep.* 1. Myrrh, 1½ dr.; powdered squills, ½ dr.; extract of henbane, 2 drs.; syrup, q. s.; divide into 30 pills.—*Dose.* 2, night and morning.

2. (A. T. Thomson.) Powdered squills and extract of hemlock, of each, ½ dr.; ammoniacum, 1½ dr.; divide into 30 pills. *Dose.* 2, twice or thrice a day. In chronic coughs, asthma, &c., after an aperient. See PECTORAL PILLS, &c.

Pills, Family Antibil'ious. *Syn.* ALOE PILLS; ALOËS ROSATA, PILULÆ ALOËS ROSATÆ, L. *Prep.* Socotrine or hepatic aloes, 3 oz.; juice of roses, 1 pint; dissolve by heat, strain through a piece of coarse flannel, evaporate to a proper consistence, and form it into pills. Purgative, in doses of 5 to 15 grs.

Pills, Fe'ver. *Syn.* PILULÆ FEBRIFUGÆ, L. Of these, the principal are those containing antimonials, bark, quinine, and salicine (which *see*).

Pills, Fordyce's. An active purgative, closely resembling in composition the compound gamboge pill of the Ph. L.

Pills, Dr. Fothergill's. *Prep.* (Cooley). Aloes, 4 drs.; extract of colocynth and scammony, of each, 1 dr.; diaphoretic antimony, 30 grs.; syrup, q. s. For 3½-gr. pills. A diaphoretic aperient.—*Dose.* 1 to 4 pills, at bedtime.

Pills of Fox'glove and Hen'bane. *Syn.* PILULÆ DIGITALIS ET HYOSCYAMI, L. *Prep.* (Dr. A. T. Thomson). Powdered foxglove, 4 grs.; powdered camphor, 12 grs.; extract of henbane, 18 grs. For 6 pills.—*Dose.* 1 or 2 at bedtime; as a sedative in maniacal and spasmodic affections, &c.

Pills of Fox'glove and Squills. *Syn.* PILULÆ DIGITALIS ET SCILLÆ (Ph. E.), L. *Prep.* (Ph. E.) Powdered foxglove and squills, of each, 1 part; aromatic electuary (Ph. E.), 2 parts; conserve of red roses, q. s.; divide into 4-gr. pills. A valuable diuretic in dropsies. *Dose.* 1 to 2 pills.

Pills, Frank's. See DINNER PILLS.

Pills, Frankfort. These are the Pilules Angeliques noticed among PATENT MEDICINES, formed into 2-gr. pills, and silvered.

Pills of Fuligoka'li. *Syn.* PILULÆ FULIGOKALI, L. *Prep.* (Deschamps). Fuligokali, 5 dr.; starch, 2½ dr.; powdered tragacanth, 10 grs.; syrup, q. s. For 100 pills, which must be covered with 2 or 3 coats of gum, and preserved from the air. The pills of sulphuretted fuligokal (Pilulæ Fuligokali Sulphurati) are prepared in a similar manner.

Pills, Fuller's. *Syn.* BENNET PILLS; PILULÆ BENEDICTÆ, L. *Prep.* (Cooley.) Aloes and sulphate of iron, of each, ½ dr.; myrrh and senna, of each, 20 grs.; assafœtida and galbanum, of each, 10 grs.; mace and saffron, of each, 6 grs.; syrup, q. s.; mix and divide into 4-gr. pills. Antispasmodic, emmenagogue, and tonic, and slightly aperient.—*Dose.* 1 to 4, according to the object in view.

Pills, Gairthorn's Mild Provi"sional. *Prep.* (Cooley). Compound gamboge pill, 60 grs.; aqueous extract of aloes, 40 grs.; sulphate of potassa and extract of senna, 30 grs.; compound scammony powder, 15 grs.; balsam of Peru, 6 or 8 grs.; emetic tartar, 3 grs.; mix, and divide into 36 pills. Purgative.—*Dose.* 1, 2, or more, when required.

Pills of Gal'banum (Compound). *Syn.* PILULA GALBANI COMPOSITA (Ph. L.), PILULÆ G. COMPOSITÆ, L. *Prep.* 1. (Ph. L.) Myrrh and prepared sagapenum, of each, 3 drs.; prepared galbanum and soft soap, of each, 2 drs.; prepared assafœtida, 1 dr.; treacle, q. s. to form a pill-mass.

2. (Ph. L. 1836.) As the last, omitting the soap.

3. (Ph. D. 1826.) As the Ph. L., except that treacle is substituted for syrup.

Obs. These pills are stimulant, expectorant antispasmodic, and emmenagogue.—*Dose.* 10 to 20 grs.; in hysteria, chronic coughs, chlorosis, amenorrhœa, &c.

Pills of Galbanum with Iron. *Syn.* PILULÆ GALBANI CUM FERRO, L. *Prep.* (Guy's Hosp.) Compound galbanum pill, 2 parts; precipitated sesquioxide of iron, 1 part; water, q. s. to form a mass. For 4½-gr. pills. An excellent tonic emmenagogue.—*Dose.* 10 to 20 grs.; in chlorosis, amenorrhœa, &c., when chalybeates are not contra-indicated.

Pills of Gam'boge (Compound). *Syn.* GAMBOGE PILLS, FORDYCE'S P.; PILULÆ CAMBOGIÆ COMPOSITA (Ph. L.), P. CAMBOGIÆ (Ph. E.), L. *Prep.* 1. (Ph. L.) Powdered Socotrine or hepatic aloes, 3 drs.; powdered gamboge, 2 drs.; powdered ginger, 1 dr.; soft soap (Ph. L.), 4 drs.; mix, and beat them to a pill-mass. The formulæ of the Ph. L. 1836 and Ph. D. 1826 are precisely similar.

2. (Ph. E.) Gamboge, East Indian or Barbadoes aloes, and aromatic powder, of each (in powder), 1 part; Castile soap, 2 parts; syrup, q. s.

Obs. Both the above are active cathartics. —*Dose.* 5 to 15 grs., at bedtime; in obstinate constipation, &c.

Pills of Gen'tian (Compound). *Syn.* PILULÆ GENTIANÆ COMPOSITÆ, L. *Prep.* (W. Cooley.) Extract of gentian, 1 dr.; powdered rhubarb and cardamoms, of each, ½ dr.; ipecacuanha, 12 grs. For 3-gr. pills. Stomachic.—*Dose.* 2 or 3, twice or thrice daily, to improve the appetite and digestion.

Pills, Gout. *Syn.* PILULÆ ANTARTHRITICÆ, L. *Prep.* 1. (Bouchardat.) Extract of colchicum and compound extract of colocynth, of each, 1 dr.; aqueous extract of opium, 3 grs.; mix, and divide into 3-gr. pills.—*Dose.* 1 or 2, according to their purgative action, as required.

2. (Sir H. Halford's.) From acetic extract of colchicum, ½ dr.; Dover's powder and compound extract of colocynth, of each, 18 grs. For 12 pills.—*Dose.* 1 pill.

3. (Lartigue's.) From compound extract of colocynth, 20 grs.; alcoholic extract of colchicum seeds and alcoholic extract of digitalis, of each, 1 gr. For 2-gr. pills.—*Dose, &c.* As the last.

4. (St. George's Hosp.) Acetic extract of colchicum, 12 grs.; Dover's powder, 30 grs. For 12 pills.—*Dose.* 2 pills.

5. (Sir C. Scudamore's.) From acetic extract of colchicum, 1 dr.; powdered marshmallow root, q. s. to form a mass. For 40 pills. —*Dose.* 1 to 3, or more, with caution, as required.

6. (Trousseau & Reveil.) Powdered colchicum seeds, ½ dr.; powdered digitalis and sulphate of quinine, of each, 15 grs.; calomel and extract of colocynth, of each, 8 grs.; syrup, q. s. For 20 pills.—*Dose.* 1 to 4, during the day, at the commencement of an attack of gout. Other formulæ for gout pills will be found under the respective names.

Pills, Dr. Griffitt's. Powdered rhubarb, 1½ dr.; sulphate of iron, ½ dr.; Castile soap, 40 grs.; water, q. s. to form a mass, For 48 pills. An excellent remedy in costiveness, with loss of tone of the bowels.—*Dose.* 2 to 4, at bedtime.

Pills of Gua'iacum (Compound). *Syn.* PILULÆ GUAIACI COMPOSITÆ, L. *Prep.* 1. Powdered resin of guaiacum, 1 dr.; oxysulphide of antimony, 40 grs.; oil of cajeput, 12 drops; extract of gentian, q. s. to form a mass. For 4-gr. pills.—*Dose.* 3 to 6, thrice daily; in gout, rheumatism, secondary syphilis, various obstinate cutaneous affections, &c.

2. (St. B. Hosp.) Guaiacum, 30 grs.; ipecacuanha and opium, of each, 3 grs.; syrup, q. s. For 12 pills.—*Dose.* 1 to 3. As the last.

Pills, Halford's. See GOUT PILLS.

Pills, Dr. Hamilton's. The same as the colocynth and henbane pill of the Ph. E. The compound pills of gamboge, now vended under the title of 'MORISON'S No. 2 PILLS,' were long known in Scotland as Dr. Hamilton's Pills.

Pills, Head'ache. *Syn.* CEPHALIC PILLS; PILULÆ CEPHALICÆ, P. ANTICEPHALALGICÆ, L. *Prep.* 1. Caffeine, 15 grs.; aloes, 20 grs.; conserve of hips, q. s. For 12 pills.—*Dose.* 1, occasionally; when only one side of the head is affected.

2. (Broussais.) Extract of opium, 6 grs.; extracts of belladonna and henbane, of each, 15 grs.; extract of lettuce, 30 grs.; butter of cacao, 4 drs. For 120 pills.—*Dose.* 1, twice or thrice daily; in headache, accompanying spasmodic affections, &c.

3. (Dr. Wilson Philip.) Powdered nutmeg and rhubarb, of each, 20 grs.; extract of chamomile, 20 grs.; oil of peppermint, 10 or 12 drops. For 30 pills.—*Dose.* 1 to 3, thrice daily; in nervous headaches.

Pills, Helvetius's. *Syn.* PILULÆ ALUMINIS HELVETII, L. *Prep.* Alum, 2 drs.; dragon's blood, 1 dr.; honey of roses, to mix. For 48 pills. Astringent.

Pills of Hem'lock (Compound). *Syn.* PILULA CONII COMPOSITA (B. P., Ph. L.), L. *Prep.* (Ph. L.) Extract of hemlock, 5 drs.; powdered ipecacuanha, 1 dr.; treacle, q. s. Antispasmodic, expectorant, and narcotic.—*Dose.* 4 to 8 grs. (B. P. 5 to 10 grs.), twice or thrice daily; in hooping-cough, bronchitis, incipient phthisis, &c.

Pills of Henbane (Compound). *Syn.* PILULÆ HYOSCYAMI ET ZINCI, L.; PILULES DE MEGLIN, Fr. *Prep.* (P. Cod.) Extracts of henbane and valerian, and oxide of zinc, equal parts. For 3-gr. pills.—*Dose.* 1 to 10; as an anodyne or sedative in neuralgia, nervous attacks, &c.

Pills, Lady Hesketh's. See DINNER PILLS.

Pills, Hoffmann's. See PILLS OF CORROSIVE SUBLIMATE.

Pills, Holloway's. See PATENT MEDICINES.

Pills, Hooper's Female. *Prep.* 1. (Gray.) Sulphate of iron and water, of each, 8 oz.;

dissolve, add, Barbadoes aloes, 2½ lbs.; white canella, 6 oz.; myrrh, 2 oz.; opopanax, 1 oz.

2. (Phil. Coll. of Pharm.) Barbadoes aloes, 8 oz.; dried sulphate of iron, 2¼ oz.; myrrh, extract of black hellebore, and Castile soap, of each, 2 oz.; canella and ginger, of each, 1 oz.; water, q. s.; divide the mass into 2½- or 3-gr. pills, and put 40 into each box. Cathartic and emmenagogue.—*Dose.* 2, or more. "If we omit the soap, lessen the quantity of extract of hellebore, and increase that of the aloes, we think the form will be nearer that of the original." (Cooley.)

Pills, Humphrey's. See PECTORAL PILLS.

Pills, Hunter's. See RENAL PILLS.

Pills, Hydragogue. See BONTIUS'S PILLS, &c.

Pills, Hydropho'bia. *Syn.* PILULÆ AD RABIEM, L. *Prep.* (Werlhoff.) Cantharides (in very fine powder), 2 grs.; belladonna and calomel, of each, 4 grs.; camphor, 8 grs.; mucilage, q. s. For 12 pills.—*Dose.* 2 to 3, twice daily.

Pills of In'dian Hemp. *Syn.* PILULÆ CANNABIS INDICÆ, L. *Prep.* From alcoholic extract of Indian hemp, ½ dr.; sugar of milk, 1 dr.; mucilage, q. s. For 48 pills. An excellent pill for soothing pain and quieting the system, acting without causing headache or constipation of the bowels.—*Dose.* 1 pill, increased to 2 or more, as necessary. (See page 602.)

Pills of In'digo. See EPILEPSY PILLS.

Pills of I'odide of Arsenic. *Syn.* PILULÆ ARSENICI IODIDI, L. *Prep.* 1. (Dr. Neligan.) Iodide of arsenic, 2 grs.; manna, 40 grs.; mucilage, q. s.; mix, and divide into 20 pills.

2. (Gardiner.) Iodide of arsenic, 1 gr.; extract of hemlock, 20 grs. For 12 pills.—*Dose.* 1 pill, twice or thrice daily; in lepra, psoriasis, and some other scaly skin diseases.

Pills of Iodide of Iron. *Syn.* PILULÆ FERRI IODIDI, L. *Prep.* 1. Unoxidized iron filings (recently levigated), 20 grs.; iodine, 40 grs.; distilled water, ½ dr.; mix in a cold wedgwood-ware mortar, and triturate them together until the red colour of the mixture has entirely disappeared; then add, of powdered gum, 20 grs.; powdered sugar, 1 dr.; liquorice powder, q. s. to form a mass, and divide it into 48 pills. Each pill contains 1 gr. of dry iodide of iron.—*Dose.* 1 to 6 pills, twice or thrice a day.

2. (Ph. U. S.) Protosulphate of iron, 60 grs.; iodide of potassium, 80 grs.; (both in fine powder;) mix, add of powdered tragacanth, 10 grs.; powdered sugar, 30 grs.; and form the whole into a mass with syrup, q. s. For 40 pills. Each pill contains nearly 2 grs. of the dry iodide, or about 2½ grs. of the common hydrated iodide of the shops.—*Dose.* 1 to 3, as the last.

Obs. The above pills are reputed alterative, tonic, and emmenagogue, and are found peculiarly useful in indurations, scrofula, chlorosis, leucorrhœa, &c., when the administration of chalybeates is not contra-indicated.

Pills of Iodide of Lead. *Syn.* PILULÆ PLUMBI IODIDI, L. *Prep.* From iodide of lead, 15 grs.; powdered sugar, 1½ dr.; mucilage, q. s. For 60 pills.—*Dose.* 1 pill, gradually increased to 3, or more, twice a day; in scrofula, scirrhus, &c. (See page 684.)

Pills of Iodide of Mer'cury. *Syn.* PILULÆ HYDRARGYRI IODIDI, L. *Prep.* 1. (Ph. L. 1836.) Green iodide of mercury and powdered ginger, of each, 1 dr.; conserve of hips, 3 drs.—*Dose.* 2 to 5 grs., twice or thrice daily, as an alterative in scrofula and scrofulous syphilis, &c.

2. (COINDET'S PILLS.) From green iodide of mercury, 1 gr.; extract of liquorice, 20 grs.; mix, and divide into 8 pills.—*Dose.* 2 to 4, as the last. Pills of red iodide of mercury are made in the same way, but, owing to its greater activity, only one fourth of the above quantity of iodide must enter into their composition.

Pills of Iodide of Potas'sium. *Syn.* PILULÆ POTASSII IODIDI, L. *Prep.* 1. Iodide of potassium and powdered starch, of each, ½ dr.; conserve of hips, q. s. For 36 pills.—*Dose.* 1 to 6, thrice daily; in glandular indurations and enlargements, goiture, scrofula, &c.

2. (Voght.) Iodide of potassium, 15 grs.; burnt sponge and extract of dulcamara, of each, 5 drs.; water, q. s. For 180 pills.—*Dose.* 4 to 6, twice a day; as the last.

Pills of I'odine. *Syn.* PILULÆ IODINII, L. *Prep.* (Radius.) Iodine, 6 grs.; extract of gentian, 1 dr.; powdered gum, q. s. For 24 pills.—*Dose.* 1 to 3; in scrofula, &c.; also in mercurial and scorbutic salivation.

Pills of Iod'oform. *Syn.* PILULÆ IODOFORMI, L. *Prep.* (Bouchardat.) Iodoform, ½ dr.; extract of wormwood (or gentian), 1 dr.; mix, and divide into 36 pills.—*Dose.* 1, twice or thrice daily; in scrofula, &c.

Pills of Ipecac'uanha (Compound). *Syn.* PILLS OF IPECACUANHA WITH SQUILLS, P. OF I. AND OPIUM; PILULA IPECACUANHÆ CUM SCILLÂ (Ph. L.), P. IPECACUANHÆ ET OPII (Ph. E.), L. *Prep.* 1. (Ph. L.) Compound powder of ipecacuanha (Dover's powder), 3 drs.; powdered ammoniacum and squills (freshly powdered), of each, 1 dr.; treacle, q. s. to form a pill-mass. Anodyne, sudorific, and expectorant.—*Dose.* 5 to 10 grs.; in chronic coughs and asthma, &c.

2. (Ph. E.) Dover's powder, 3 parts; conserve of red roses, 1 part; mix, and divide into 4-gr. pills. Resembles Dover's powder in its effects. It is hence regarded by many as a useless preparation.

Pills of I'ron (Compound). *Syn.* PILULA FERRI COMPOSITA (Ph. L.), P. F. CUM MYRRHÂ, L. *Prep.* (Ph. L.) Myrrh (in powder), 2 drs.; carbonate of soda, 1 dr.; rub them together in a warm mortar, then add of sulphate of iron, 1 dr., and again triturate; lastly, add of treacle, 1 dr., and beat all together, to form a pill-mass. An excellent mild chalybeate tonic and emmenagogue, similar in its properties to

'Griffith's Mixture.'—*Dose.* 5 to 15 grs., two or three times a day.

Pills, Italian Black. *Syn.* PILULÆ ITALICÆ NIGRÆ, P. ALOETICÆ FERRATÆ, L. *Prep.* (Ph. Bor.) Powdered aloes and dried sulphate of iron, equal parts; beaten up with rectified spirit, q. s., and divided into 2- or 2½-gr. pills. See PILLS OF ALOES AND IRON.

Pills of Jal'ap. *Syn.* PILULÆ JALAPÆ, L. *Prep.* 1. (Ph. E. 1783.) Extract of jalap, 2 drs.; aromatic powder, 1 dr.; syrup, q. s.

2. (Ph. Bor.) Soap of jalap, 3 parts; powdered jalap, 1 part; beat them to a pill-mass. —*Dose.* (Of either) 10 to 15 grs.

Pills, James's Analep'tic. *Prep.* 1. Antimonial powder, guaiacum, and pill of aloes with myrrh, equal parts; syrup, q. s.

2. (Cooley.) Antimoniai powder (James's), pill aloes with myrrh, and compound aloes powder, of each, 2 parts; powdered ammoniacum, 1 part; beaten up with tincture of castor, q. s., and divided into 3½-gr. pills. A diaphoretic purge.—*Dose.* 2 to 4 pills.

Pills, Dr. J. Johnson's. *Prep.* From compound extract of colocynth, 2 drs.; calomel, ½ dr.; potassia-tartrate of antimony, 2 grs.; oil of cassia, 12 drops. For 4 dozen pills. An excellent alterative and diaphoretic aperient.—*Dose.* 1 to 3 pills.

Pills, Kaye's. See WORSDELL'S PILLS.

Pills, Keyser's. *Prep.* (Guibourt.) Red oxide of mercury, 1½ oz.; distilled vinegar (dilute acetic acid), 1 pint; dissolve, add to the resulting solution, manna, 2 lbs., and triturate for a long time before the fire, until a proper consistence is attained; lastly, divide the mass into pills of 1½ gr. each.

Obs. Keyser's pills were once celebrated throughout Europe as a remedy possessing extraordinary virtue, and so highly were they prized that the method of preparing them was purchased by the French government for the benefit of the nation. Richard, who first published a full account of them, concludes by observing that he considers this compound to be, without exception, the most effectual remedy for syphilis hitherto discovered. In this country, however, it has long sunk into comparative disuse with the faculty; probably from pills of acetate of suboxide of mercury being erroneously employed under the name, whereas according to Robiquet, acetate of protoxide of mercury (called by him the 'peroxide') forms the basis of the original preparation. The *dose* is 1 to 2, night and morning, as an alterative; and 2 to 6, twice a day, as a sialogogue. (See page 753.)

Pills, King's. See PATENT MEDICINES.

Pills, Kitchener's. *Syn.* DR. KITCHENER'S PERISTALTIC PERSUADERS; PILULÆ RHÆI ET CARUI, L. *Prep.* From powdered Turkey rhubarb, 2 drs.; simple syrup, 1 dr.; oil of caraway, 10 or 12 drops. For 40 pills. An admirable stomachic, dinner, or laxative pill, according to the quantity taken.—*Dose.* 2 to 6. "From 2 to 4 will generally produce one additional motion within 12 hours. The best time to take them is early in the morning."

Pills, Klein's. *Prep.* From ammoniacum and extract of centaury, of each, ½ dr.; Castile soap, 1 dr.; oil of amber, 3 drops. For 2-gr. pills. Stomachic, emmenagogue, and pectoral. —*Dose.* 2 to 6 pills.

Pills of Lac'tate of Iron. *Syn.* PILULÆ FERRI LACTATIS, L. *Prep.* (Cap.) Lactate of protoxide of iron and powdered marsh-mallow root, equal parts; clarified honey, q. s. For 3-gr. pills. One of the most valuable of the chalybeates.—*Dose.* 1 to 2, three or four times a day.

Pills of Lactuca"rium. *Syn.* PILULÆ LACTUCARII, L. *Prep.* 1. (Brera.) Lactucarium, 18 grs.; conserve of elder-berries and extract of liquorice, of each, q. s. For 12 pills.—*Dose.* 1 to 2 pills, every three or four hours; in dry asthma, obstinate coughs without expectoration, &c.

2. (Dr. Duncan.) Lactucarium, 12 grs.; liquorice powder, 20 grs.; simple syrup, q. s. For 12 pills.—*Dose.* 1 to 2 pills, every hour, as an anodyne, or to induce sleep.

Pills, Lartigue's. See GOUT PILLS.

Pills of Lead. *Prep.* 1. See PILLS OF ACETATE OF LEAD.

2. (Opiated; PILULÆ PLUMBI OPIATÆ—Ph. E.; PILULA PLUMBI CUM OPIO—B. P.) Acetate of lead, 6 parts; opium, 1 part; conserve of red roses, about 1 part; beat them to a proper mass, and divide this into 4-gr. pills. "This pill may also be made with twice the quantity of opium." In hæmorrhages, obstinate diarrhœa, dysentery, spitting of blood, and other cases demanding the use of a powerful astringent. It has also been highly extolled in cholera.—*Dose.* 1 to 3 pills, twice or thrice daily, washed down with water soured with pure vinegar.

Pills, Lee's Antibil'ious. *Prep.* ('Amer. Journ. of Pharm.') Aloes, 12 oz.; scammony, 6 oz.; calomel, 5 oz.; gamboge, 4 oz.; jalap, 3 oz.; Castile soap and syrup of buckthorn, of each, 1 oz.; mucilage, 7 oz.; beat them together, and divide the mass into 5-gr. pills. A powerful cathartic, and, from containing mercury, not adapted for frequent use. See WYNDHAM'S PILLS.

Pills, Lewis's Al'terative and Liver. These "for the most part resemble SCOTT'S BILIOUS AND LIVER PILLS. They are, however, of a more drastic and powerful character, and frequently operate with considerable violence."

Pills, Lockstadt's. *Prep.* (Phœbus.) Sulphate of quinine, 3 grs.; aromatic powder, 10 grs.; essential oil of almonds, 1 drop; extract of gentian, q. s. For 10 pills.—*Dose.* 1 to 2, thrice daily, as a stomachic tonic; or the whole at once, before an expected attack of an ague or intermittent.

Pills, Lockyer's. *Prep.* From panacea of antimony, 6 grs.; powdered white sugar, 4 drs.; mucilage, q. s. For 48 pills. Cathartic and emetic.—*Dose.* 1 to 4 pills.

Pills, Dr. Lynn's. *Prep.* From pill of aloes with myrrh and compound extract of colocynth, of each, 1 dr.; calomel, ½ dr. For 4 dozen pills. Aperient and antibilious.—*Dose.* 1 to 3; in costiveness, biliousness, &c.

Pills of Man''ganese. These are chiefly prepared from the recently precipitated carbonate (PILULÆ MANGANESII CARBONATIS), the iodide (P. M. IODIDI), the chloride (P. M. CHLORIDI), the phosphate (P. M. PHOSPHATIS), the sulphate (P. M. SULPHATIS), and the double sulphate of manganese and iron (P. M. ET FERRI SULPHATIS). The best excipients are conserve of roses or of hips and liquorice powder. See MANGANESE and its salts.

Pills, Mar'tial. *Syn.* PILLS OF IRON AND WORMWOOD; PILULÆ FERRI CUM ABSINTHIO, P. MARTIALES, L. *Prep.* (Sydenham.) Levigated iron-filings, 1 dr.; extract of wormwood, q. s. Tonic and hæmatinic.—*Dose.* 5 to 10 grs., twice a day.

Pills, Matthew's. *Syn.* PILULÆ MATTHÆI, P. PACIFICÆ, L. *Prep.* 1. (Dr. Paris.) Black hellebore, Castile soap, liquorice, opium, saffron, and turmeric, equal parts; made into pills with oil of turpentine.

2. (Ph. E. 1744.) Opium and saffron, of each, 1 dr.; castor, 2 drs.; soap of turpentine, 3 drs.; balsam of copaiba (or oil of turpentine), q. s. to form a mass. Alterative and anodyne. —*Dose.* 3 to 10 grs.

Pills, McKinsey's. See MCKINSEY'S KATAPOTIA, among PATENT MEDICINES.

Pills, Meglin's. *Syn.* PILULES DE MEGLIN, Fr. See PILLS OF HENBANE (Compound).

Pills, Mercu''rial. *Syn.* BLUE PILL; PILULA HYDRARGYRI (B. P.), PILULÆ HYDRARGYRI (Ph. L.), PILULÆ H. (Ph. E. & D.), P. MERCURIALES, L.; PILULES MERCURIELLES, Fr. *Prep.* 1. (Ph. L.) Mercury, 4 drs.; confection of roses, 6 drs.; rub them together until globules can no longer be seen; then add of liquorice powder, 2 drs., and beat the whole together, so that a proper mass may be formed.

2. (Ph. E.) As the last; afterwards dividing the mass into 5-gr. pills.

3. (Ph. D.) As the Ph. L. formula, but taking four times the quantity of the respective ingredients.

4. (B. P.) Mercury, 2; confection of roses, 3; decorticated liquorice root, in fine powder, 1; rub the mercury with the confection of roses until metallic globules are no longer visible, then add the liquorice, and mix the whole well together.—*Dose.* 3 to 6 grs. as an alterative, 10 grs. as a purgative.

Obs. The remarks under 'MERCURIAL OINTMENT' (page 850), for the most part, also apply here. This pill, when properly prepared, presents no globules of mercury when moderately rubbed on a piece of white paper, and immediately communicates a white stain to a piece of bright gold or copper. It possesses considerable density, and has a dark blue or slate colour. It contains 1-3rd of its weight of mercury, which may be ascertained from its sp. gr.; or, more exactly, by an assay for the metal. It is the mildest and the most extensively used of all the mercurial preparations. —*Dose.* As an alterative, 1 to 3 grs.; as a purgative, 10 to 15 grs.; and as a sialogogue, 5 or 6 grs., or more, twice or thrice daily. To prevent it affecting the bowels, it is commonly combined with either rhubarb or opium. A blue pill taken over-night, and a black draught in the morning, is a popular remedy in bilious complaints. See ABERNETHY MEDICINES.

4. (Collier.) Mercury, 2 drs.; sesquioxide of iron, 1 dr.; confection of red roses, 3 drs.; triturated, as before, until the globules disappear. An excellent extemporaneous substitute for the common mercurial pill. The addition of only a few grs. of the sesquioxide of iron to 1 oz. of conserve, renders the latter capable of rapidly killing a large quantity of quicksilver.

5. (Tyson.) Gray oxide of mercury (prepared by decomposing calomel with liquor of potassa to which a little liquor of ammonia has been added), 2 drs.; confection of roses, 6 drs.; powdered chamomiles, 1 dr.; mix. As a substitute for the College pill.

6. ('Pharm. Journ.') Stearin, 1 dr.; rub it in a warm mortar till it assumes the consistence of thick cream, then add of mercury, 4 drs., and again triturate until the globules disappear; next further add, of confection of roses and wheaten flour, of each, 3 drs., powdered gum, 1 dr., and form the whole into a pill-mass. As a substitute for the College pill.

7. (PILULÆ HYDRARGYROSÆ—P. Cod.) Mercury and honey, of each, 6 drs.; triturate till the globules are extinguished, then add of aloes, 6 drs.; rhubarb, 3 drs.; scammony, 2 drs.; black pepper, 1 dr.; and make a pill-mass as before. Contains 1-4th part of quicksilver. Alterative and aperient.—*Dose.* 5 to 10 grs. BELLOSTE'S, BARBAROSSA'S, SÉDILLOT'S, and MORELOT'S PILLS, are nearly similar compounds. See PILLS OF CALOMEL and CORROSIVE SUBLIMATE, &c.

Pills, Mercurial (Arabic). *Syn.* PILULÆ MERCURIALES ARABICÆ, L. *Prep.* Take of quicksilver and corrosive sublimate, of each ½ dr.; triturate them patiently together until the globules disappear; then add, of agaric, pellitory, and senna, of each, 1 dr.; honey, q. s. to make a pill-mass. For 3½-gr. pills.—*Dose.* 2 a day. Employed in the 'traitement arabique' for the cure of obstinate cutaneous diseases.

Pills, Mitchell's. *Prep.* Aloes, ½ dr.; rhubarb, 1 dr.; calomel, 6 grs.; emetic tartar, 2 grs. For 36 pills. An alterative aperient.—*Dose.* 2 to 4 pills.

Pills, Moat's. Similar to MORISON'S PILLS.

Pills, Morison's. *Prep.*—*a.* (No. 1 Pills.) From aloes and cream of tartar, equal parts made into a mass with either syrup or mucilage. A mild aperient.

b. (No. 2 pills.) From colocynth, 1 part; gamboge, 2 parts; aloes, 3 parts; and cream of tartar, 4 parts; made into a mass with syrup, as the last. An active purgative, often acting with great violence. Both No. 1 and No. 2 are divided into 3-gr. pills, of which 4 dozen are put into each thirteen-penny-halfpenny box. The proper dose of either is 1 to 3 or 4 pills; but they are often given by the Morisons in doses of 12, 20, 30, or even more, daily. For the history of these pills and their proprietors, see 'Anat. of Quackery,' or 'Med. Circ.,' ii, 9-27.

Pills of Mor'phia. *Syn.* PILULÆ MORPHIÆ, L. *Prep.* (Magendie.) Morphine, 1 gr.; conserve of roses (stiff), q. s. For 6 (or, better, 8) pills.—*Dose.* 1 pill; as an anodyne or soporific.

Pills, Moseley's. *Prep.* Finest Turkey rhubarb, 60 grs.; Jamaica ginger, 30 grs.; sugar, 20 grs.; (all in powder;) tincture of rhubarb, q. s. to form a mass. For 4-gr. pills. A mild and excellent medicine, closely resembling KITCHENER'S PERISTALTIC PERSUADERS.

Pills of Musk. *Syn.* PILULÆ MOSCHI, L. *Prep.* (Dupuytren.) Opium, 2 grs.; musk (genuine), 8 grs.; camphor (in powder), 24 grs.; syrup, q. s. For 8 pills. Antispasmodic and stimulant.—*Dose.* 1 to 3, thrice daily, in low nervous affections; or the whole during the day, in hospital gangrene, &c.

Pills of Myrrh. See PILLS OF ALOES AND MYRRH.

Pills, Napier's Neuroton'ic. Of these, like MORISON'S PILLS, there are No. 1 and No. 2. The first is a simple stomachic aperient; the other, a stimulant tonic. They both owe their sale and reputed virtues to extensive advertising. ('Anat. of Quackery.')

Pills, Napoleon's. See PECTORAL PILLS.

Pills, Neuralg'ia. *Syn.* PILULÆ ANTINEURALGICÆ, L. *Prep.* 1. (Marchal De Calvi.) Aqueous extract of opium, 4 grs.; sulphate of quinine, 16 grs.; powdered cinnamon, powdered orange leaves, and extract of valerian, of each, 20 grs.; syrup of belladonna, q. s. For 3 dozen pills.—*Dose.* 1, hourly.

2. (Trousseau & Reveil.) Extracts of opium and stramonium, of each, 8 grs.; oxide of zinc, 2 drs.; syrup, q. s. For 40 pills.—*Dose.* 1, every two or three hours, gradually increased in frequency until there is some considerable disorder of vision, &c. Both of the above should be used with care. See MEGLIN'S PILLS, &c.

Pills of Ni'trate of Bismuth. *Syn.* PILULÆ BISMUTHI TRISNITRATIS, L. *Prep.* From trisnitrate of bismuth and powdered rhubarb, equal parts; syrup of orange peel, q. s. to form a mass. For 3-gr. pills.—*Dose,* 1 to 2, every two hours; as a tonic, stomachic, and antispasmodic, in dyspepsia, debility, spasms, &c.

Pills of Nitrate of Sil'ver. *Syn.* PILULÆ ARGENTI NITRATIS, L. *Prep.* 1. (St. B. Hosp.) Nitrate of silver (crystallised), 12 grs.; liquorice powder, 24 grs.; treacle, q. s. For 12 pills.—*Dose.* 1 pill, twice or thrice a day; in chronic epilepsy and some other spasmodic disorders.

2. (Dr. A. T. Thomson.) Nitrate of silver, 6 grs.; crum of bread, q. s. (say ½ dr.); mix, and divide into 12 pills.—*Dose.* 1, every six hours.

Obs. To prevent the blue or slate coloured tinge of the skin, so often produced by the continued use of the salts of silver, 8 drops of diluted nitric acid in 1 fl. oz. of water should be taken after each pill.

Pills, Norton's Chamomile. *Prep.* From aqueous extract of aloes, 1 dr.; extract of gentian, 3 drs.; mix, and drive off the excess of moisture by the heat of a water bath; then add of essential oil of chamomiles, 20 drops, and divide the mass into 60 pills. To preserve their aromatic properties, they should be kept in a dry glass bottle or a well-covered earthenware pot.—*Dose.* 1, as a dinner pill; or 2, night and morning, as a stomachic tonic. ('Anat. of Quackery.')

Pills of Nux Vom'ica. *Syn.* PILULÆ NUCIS VOMICÆ, L. *Prep.* 1. Nux vomica and aloes (both in powder), equal parts; syrup, q. s. For 3-gr. pills.—*Dose.* 1 to 3, twice or thrice daily, carefully watching the effects; in nervous derangement, general debility, impotence, paralysis, &c.

2. Alcoholic extract of nux vomica, 1 part; powdered sugar, 2 parts; beaten up with rectified spirit, q. s. For 2½-gr. pills.—*Dose.* 1 to 2; as the last.

3. (Mondière.) Alcoholic extract, 6 grs.; levigated black oxide of iron, 1 dr.; syrup, q. s. In atonic incontinence of urine, amenorrhœa, &c.

Pills, Odontal'gic. *Syn.* PILULÆ ODONTALGICÆ, L. *Prep.* (Ph. Bor.) Powdered opium and extracts of belladonna and henbane, of each, 10 grs.; oil of cloves, 20 drops; powdered pellitory of Spain, ½ dr.; beat them to a mass, and divide it into 1-gr. pills; keep these in a corked phial.

Pills, Opiated Lead. See PILLS OF LEAD.

Pills of O'pium. *Syn.* ANODYNE PILLS, NIGHT P., THEBAIC P.; PILULÆ OPII (Ph. U. S.), P. O. or THEBAICÆ (Ph. E.), L. *Prep.* 1. (Ph. E.) Opium and conserve of red roses, of each, 1 part; sulphate of potash, 3 parts; rub them together to a proper mass, and divide into 5-gr. pills.—*Dose.* 1 to 2 pills, as an anodyne or soporific. Each pill contains 1 gr. of opium, or double the quantity in the same pill of the previous edition of the Ph. E.

2. (Ph. U. S.) Powdered opium, 1 dr.; Castile soap, 12 grs.; water, q. s. For 60 pills. As the last.

Pills of Ox-Gall. *Syn.* BILE PILLS; PILULÆ FELLIS BOVINI, P. BILIS, L. *Prep.* 1. From inspissated ox-gall formed into pills by the addition of any simple powder; or the harder extract beaten up with a little proof spirit.

Powdered rhubarb is frequently used for the purpose. For 3-gr. pills.—*Dose.* 1 to 6; in constipation, flatulence, &c., arising from a deficiency of bile.

2. (Compound.) From inspissated ox-gall, 1 dr.; powdered rhubarb, ½ dr.; powdered ipecacuanha and capsicum, of each, 15 grs.; oil of caraway, 12 drops. For 48 pills.—*Dose.* 1 to 4; in loss of appetite and dyspepsia, with torpor of the bowels, &c. See CONSTIPATION, GALL, &c.

Pills of Ox′ide of Gold. *Syn.* PILULÆ AURI OXYDI, L. *Prep.* (Magendie.) Teroxide of gold, 5 grs.; extract of mezereon, 2 drs.; mix, and divide into 60 pills. Each pill contains 1/12 gr. of teroxide.—*Dose.* 1 to 3; in scrofula, syphilis, malignant fevers, &c.

Pills of Oxide of Mercury. See MERCURIAL PILLS.

Pills of Oxide of Sil′ver. *Syn.* PILULÆ ARGENTI OXYDI, L. *Prep.* From oxide of silver, 6 grs.; powdered rhubarb and extract of gentian, of each, 12 grs. For 1 dozen pills.—*Dose.* 1 pill, twice or thrice daily; in gastralgia, hæmorrhages, nervous affections, &c. Milder than the pills of nitrate of silver.

Pills of Oxide of Zinc. *Syn.* PILULÆ ZINCI OXYDI, L. *Prep.* From oxide of zinc, powdered cascarilla, and conserve of hips, equal parts. For 3½-gr. pills. Tonic and antispasmodic.—*Dose.* 1 to 3, thrice daily; in dyspepsia, gastric or spasmodic coughs, epilepsy, chorea, &c.

Pills, Parr's Life. *Prep.* Aloes, 7 lbs.; rhubarb and jalap, of each, 5 lbs.; (all in powder;) extract of gentian, 3½ lbs.; soft soap, ½ lb.; liquorice powder, treacle, and moist sugar, of each, 4½ lbs.; oil of cloves, 10 oz.; oil of caraway, 3½ oz.; mix, and beat the whole to a proper mass with syrup bottoms, q. s., and divide it into 3½-gr. pills. "There are about 4 dozen in each 1s. 1½d. box, weighing (dry) barely 3 grs. each." A good stomachic and aperient pill, but possessing none of the extraordinary virtues ascribed to it by its proprietors. ('Med. Circ.,' ii, 146, 167, &c.)

Pills of Paullin′ia. *Syn.* GUARANA PILLS; PILULÆ GUARANÆ, P. PAULLINIÆ, L. *Prep.* 1. Paullinia mixed up with syrup of orange peel, and the mass divided into 2½-gr. pills.—*Dose.* 2 to 8.

2. (Dr. Gavrelle.) Extract of guarana, 1 dr.; liquorice powder, q. s. For 40 pills.—*Dose.* 3 to 6, daily.

Obs. These pills are highly esteemed on the Continent as a tonic and astringent, in diseases of the bowels and bladder, in chlorosis, debility, &c.

Pec′toral Pills. *Syn.* BREATH PILLS; PILULÆ PECTORALES, L. *Prep.* 1. Compound squill pill, 1 dr.; gum benzoin, ½ dr.; powdered ipecacuanha and extract of henbane, of each, 15 grs.; syrup, q. s. For 3-gr. pills.—*Dose.* 2 to 4, three or four times a day; in asthmas, chronic bronchial affections, coughs, &c.

[illegible] (Copland.) Camphor (in powder), 10 grs.; ipecacuanha, 15 grs.; extract of hemlock, 1 dr.—*Dose.* 3 to 6 grs.; in irritating and spasmodic coughs, &c.

3. (Haggart.) Powdered ipecacuanha and squills, of each, ½ dr.; acetate of morphia, 6 grs.; Castile soap, 3 drs.; mix, and divide into 72 pills. A most excellent medicine, at once soothing and expectorant.—*Dose.* 1 to 2, thrice a day, or oftener.

4. (HUMPHRIES' COUGH PILLS.) From powdered ipecacuanha, 15 grs.; compound squill pill, 1 dr.; compound extract of colocynth, ½ dr. For 3½-gr. pills.—*Dose.* 2 pills, night and morning.

5. (Dr. Latham.) Compound powder of ipecacuanha, 1 dr.; fresh squill and gum ammoniacum, of each, 20 grs.; calomel, 4 grs. For 20 pills. A most valuable pectoral and expectorant.—*Dose.* 1 pill, thrice daily; in bronchitis, coughs, &c., after the more active inflammatory symptoms have subsided.

6. (Napoleon's.) From ipecacuanha, 30 grs.; squills and ammoniacum, of each, 40 grs.; (all in powder;) mucilage, q. s. to mix. For 24 pills. It is said that this was a favourite remedy with the Emperor Napoleon I for difficulty of breathing, bronchitis, and various affections of the organs of respiration.—*Dose.* 2 pills, night and morning.

7. (Dr. Paris.) Powdered squills, ½ dr.; powdered myrrh, 1½ dr.; extract of henbane, 40 grs.; water (or simple syrup), q. s. to mix. For 4-gr. pills.—*Dose.* 2 pills, night and morning. As No. 2.

8. (Ph. L. 1746.) Gum ammoniacum, 4 drs.; gum benzoin, 3 drs.; gum myrrh, 2 drs.; saffron, 1 dr.; anisated balsam of sulphur, ½ dr.; syrup of tolu, q. s. to mix.—*Dose.* 5 to 15 grs.

9. (Richter.) Assafœtida and valerian, of each, ½ dr.; castor, 15 grs.; powdered squills and sesquicarbonate of ammonia, of each, 5 grs.; extract of aconite (alcoholic), 3 grs. For 4-gr. pills.—*Dose.* 1 to 3 pills, night and morning; in spasmodic affections of the respiratory organs.

Pills, Perpet′ual. See EVERLASTING PILLS.

Pills, Peter's. *Prep.* (Cooley.) Aloes, 3 drs.; gamboge, jalap, and scammony, of each, 2 drs.; (all in powder;) calomel, 1 dr.; beaten up with rectified spirit, q. s. A powerful cathartic.—*Dose.* 1 to 3 pills.

Pills of Pip′erine. *Syn.* PILULÆ PIPERINÆ, L. *Prep.* From piperine, ½ dr.; extract of cinchona, q. s. For 30 pills.—*Dose.* 1 pill every two hours, during the intermission of an ague; also as an aphrodisiac and a remedy in piles.

Pills of Pitch. *Syn.* PILULÆ PICIS NIGRÆ, L. *Prep.* From black pitch and powdered black pepper, equal parts; beaten together in a warm mortar, and divided into 4-gr. pills.—*Dose.* 2 pills, night and morning; in piles, &c.

Pitschaft's Eccoprot′ic Pills. *Prep.* From strained aloes and disulphate of quinine, equal parts; made into 2-gr. pills. A tonic and stomachic aperient.—*Dose.* 2 to 4, at bedtime; in torpor of the large intestines, the dyspepsia of the debilitated, &c.

Plummer's Pills. See PILLS OF CALOMEL (Compound).

Pills, Pur′gative. *Syn.* PILULÆ PURGANTES, L. *Prep.* 1. (Dr. Robinson.) Aqueous extract of aloes, 1 dr.; powdered scammony, ½ dr.; balsam of Peru, 10 or 12 grs.; oil of caraway, 9 or 10 drops; mix, and divide into 30 pills. A warm, stimulating aperient, highly recommended to excite the peristaltic action of the bowels of the aged, sedentary, and debilitated.—*Dose.* 1 to 4 pills, as required.

2. (Trousseau & Reveil.) Resin of jalap, 1 dr.; scammony, ½ dr.; extract of colocynth, 6 grs.; excipient, as required. For 20 (or, better, 24) pills.—*Dose.* 1, "every two hours, in the morning, fasting, until they operate." For other formulæ see APERIENT and CATHARTIC PILLS and PILLS OF ALOES, JALAP, COLOCYNTH, &c.

Pills of Quinine′. See PILLS OF SULPHATE OF QUININE.

Pills, Reece's. See CHIRAYTA PILLS.

Pills, Re′nal. *Syn.* PILULÆ RENALES, L. *Prep.* 1. Squills, myrrh, and digitalis, of each (in powder), 10 grs.; extract of rhubarb and mercurial pill, of each, 15 grs.; powdered nitre, 20 grs.; oil of juniper, 10 or 12 drops. For 24 pills. Alterative, diuretic, and tonic.—*Dose.* 3 to 6, thrice a day. Hunter's Renal Purifying Pills are similar, but omitting the mercurial pill. De Roos' Renal Pills contain a preparation of copaiba.

Pills, Rheu′matism. *Syn.* PILULÆ ANTIRHEUMATICÆ, L. *Prep.* 1. Gum guaiacum, 1 dr.; nitrate of potassia, 1½ dr.; (both in powder;) soft soap (Ph. L.), ½ dr.; oil of cajeput, 16 drops. For 4 dozen pills.—*Dose.* 2 to 6, night and morning; in chronic rheumatism, and rheumatic gout. Their action is accelerated by the copious use of lemon juice during the day.

2. (Beasley.) Extract of artichoke, ½ dr.; powdered sarsaparilla, 20 grs.; oil of sassafras, 1 drop. For 12 pills.—*Dose.* 1 pill, thrice daily.

Pills of Rhu′barb. *Syn.* PILULÆ RHEI (Ph. E.), L. *Prep.* 1. (Ph. E.) Powdered rhubarb, 9 parts; acetate of potassa, 1 part; conserve of red roses, 5 parts; mix, and divide into 5-gr. pills. A stomachic and gentle aperient, particularly useful in atonic dyspepsia.—*Dose.* 2 to 4 pills.

2. (Ph. U. S.) Powdered rhubarb, 6 drs.; Castile soap, 2 drs.; beaten up with water, q. s., and divide into 120 pills. As the last.

Pills of Rhubarb (Compound). *Syn.* AROMATIC PILLS, BALSAMIC LAXATIVE P., EDINBURGH P., STOMACHIC P.; PILULA RHEI COMPOSITA (B. P., Ph. L.), PILULÆ R. COMPOSITÆ (Ph. E. & D.), P. STOMACHICÆ, P. AROMATICÆ, L. *Prep.* 1. (Ph. L.) Powdered rhubarb, 4 drs.; powdered Socotrine aloes, 3 drs.; powdered myrrh, 2 drs.; soft soap, (Ph. L.), ½ dr.; oil of caraway, 15 drops; treacle, q. s. to form a mass.

2. (Ph. L. 1836.) Powdered rhubarb, 1 oz.; aloes, 6 drs.; myrrh, 4 drs.; Castile soap, 1 dr.; oil of caraway, ½ fl. dr.; syrup, q. s.

3. (Ph. E.) Powdered rhubarb, 12 parts; aloes, 9 parts; myrrh and Castile soap, of each, 6 parts; conserve of red roses, 5 parts; oil of peppermint, 1 part; mix, and divide into 5-gr. pills. The oil of peppermint may be omitted, when so preferred.

4. (Ph. D.) Rhubarb, 1½ oz.; hepatic aloes, 9 drs.; myrrh and Castile soap, of each, in fine powder, 6 drs.; oil of peppermint, 1 fl. dr.; treacle, 2 oz.; mix, and beat the whole to a uniform mass.

5. (Ph. U. S. & Ph. E. 1817.) Rhubarb, 8 drs.; aloes, 6 drs.; myrrh, 4 drs.; oil of peppermint, ½ fl. dr.; syrup of orange peel, q. s.; mix, and divide into 240 pills.

6. (B. P.) Rhubarb, in fine powder, 3 oz.; Socotrine aloes, in fine powder (some physicians prefer the aqueous extract.—*Squire*), 2¼ oz.; myrrh, in fine powder, 1½ oz.; hard soap, 1½ oz.; English oil of peppermint, 1½ dr.; treacle, by weight, 4 oz.; reduce the soap to fine powder and triturate it with the rhubarb, aloes, and myrrh; add the treacle and oil, and beat into a mass.—*Dose.* 5 to 10 grs.

Obs. The above are tonic, stomachic, and gently laxative; extremely useful for obviating costiveness and giving tone to the stomach and bowels.—*Dose.* 6 or 8 to 20 grs. The London pill is not only the most agreeable, but it keeps the best.

Pills of Rhubarb and Car′away. See KITCHENER'S PILLS.

Pills of Rhubarb and Chamo′mile. *Syn.* SPEEDIMAN'S PILLS; PILULÆ RHEI ET ANTHEMIDIS, L. *Prep.* From aloes, myrrh, rhubarb (each in powder), and extract of chamomile, of each, 1 dr.; essential oil of chamomile, 10 or 12 drops. For 4-gr. pills. An excellent tonic and stomachic aperient, particularly useful in the dyspepsia and loss of appetite of hard drinkers.—*Dose.* 1 to 3 pills, either before dinner or at bedtime.

Pills of Rhubarb and Copai′ba. *Syn.* PILULÆ RHEI ET COPAIBÆ, P. R. BALSAMICÆ, L. *Prep.* (Swediaur.) Powdered rhubarb and gum, equal parts; balsam of capaiba, q. s.

Pills of Rhubarb and Gin′ger. *Syn.* STOMACH PILLS; PILULÆ RHEI ET ZINGIBERIS, L. *Prep.* From powdered rhubarb, 1 dr.; powdered ginger, ½ dr. Castile soap, 20 grs.; tincture or essence of ginger, q. s. to form a mass. For 30 pills.—*Dose.* 1 to 6.

Pills of Rhubarb and Ipecac′uanha. *Syn.* PILULÆ RHEI ET IPECACUANHÆ, L. *Prep.* From rhubarb, ½ dr.; ipecacuanha, 15 grs.; opium, 5 grs.; (each in powder;) oil of cinnamon, 6 drops; syrup, q. s. For 18 pills.—*Dose.* In loss of appetite and spasmodic dyspepsia, 1 to 3 pills, twice a day; in dysente diarrhœa, &c., to relieve tormina and tenesmus, 1 every two hours.

Pills of Rhubarb and I'ron. *Syn.* PILULÆ RHEI ET FERRI (Ph. E.), L. *Prep.* (Ph. E.) Dried sulphate of iron, 4 parts; extract of rhubarb, 10 parts; conserve of red roses, 5 parts; beat them to a proper mass, and divide this into 5-gr. pills.—*Dose.* 2 to 4 pills; in the atonic dyspepsia of debilitated subjects, in chlorosis, &c.

Pills of Rhubarb and Ox-gall. *Syn.* PILULÆ RHEI ET FELLIS BOVINI, L. *Prep.* From powdered rhubarb, gum ammoniacum, and inspissated ox-gall, equal parts; beaten up with a little tincture of ginger or proof spirit, and the mass divided into 2½-gr. pills. In dyspepsia and constipation dependent on a torpid action of the liver.—*Dose.* 2 to 6 pills.

Pills of Rhubarb and So'da. *Syn.* PILULÆ RHEI ET SODÆ, P. R. COMP. CUM SODÂ, L. *Prep.* (Guy's Hosp.) Dried carbonate of soda, powdered rhubarb, and extract of gentian, equal parts. For 4½-gr. pills.—*Dose.* 2 to 4 pills; in acidity, heartburn, diarrhœa, loss of appetite, &c.

Pills, Richter's. See PECTORAL PILLS.

Pills, Dr. Robinson's. See PURGATIVE PILLS.

Pills, Rudius's. *Syn.* RUDIUS'S EXTRACT; PILULÆ RUDII, EXTRACTUM RUDII, L. *Prep.* 1. Colocynth pulp, 6 drs.; agaric, black hellebore, and turpethum root, of each, 4 drs.; cinnamon, mace, and cloves, of each, 40 grs.; rectified spirit, ½ pint; digest for 4 days, express the tincture, and evaporate it to a proper consistence for making pills. Formerly esteemed one of the most safe and certain cathartics in troublesome constipation.—*Dose.* 5 to 20 grs.

2. (Ph. E. 1783.) Black hellebore and colocynth, of each, 2 oz.; water, 4 pints (o. w. m.); boil to a quart, strain, evaporate to the consistence of honey, and add, of aloes, 2 oz.; scammony (powdered), 1 oz.; next remove the vessel from the fire, and further add of sulphate of potassa, 2 drs.; oil of cloves, 1 dr.; and form the whole into a pill-mass. Resembles the last (nearly).

Pills, Rufus's. See PILLS OF ALOES WITH MYRRH.

Pills of Saf'fron. *Syn.* PILULÆ CROCI, L. *Prep.* From hay saffron, 1 dr.; myrrh, ½ dr.; oil of cajeput, 6 drops; syrup of saffron, q. s. For 36 pills.—*Dose.* 1 to 3 or 4, occasionally; as a stimulant in low spirits, hypochondriasis, &c.

2. (Phœbus.) Saffron, myrrh, and sulphur, equal parts; inspissated bile, q. s. For 2-gr. pills.—*Dose.* 2 to 12 daily; as an emmenagogue.

Pills of Sagape'num (Compound). *Syn.* PILULÆ SAGAPENI COMPOSITÆ, L. *Prep.* (Ph. L. 1836.) Sagapenum, 1 oz.; aloes, ½ dr.; syrup of ginger, q. s.—*Dose.* 5 to 20 grs.; as a stimulant antispasmodic laxative, in dyspepsia with flatulent colic, &c.

Pills of Sal'icin. *Syn.* PILULÆ SALICINÆ, L. *Prep.* From salicin, ½ dr.; powdered rhubarb, 20 grs.; extract of gentian, q. s. to mix. For 4-gr. pills.—*Dose.* 2 to 4, every three hours, during the apyrexia of intermittents.

Pills of Scam'mony (Compound). *Syn.* PILULÆ SCAMMONII COMPOSITÆ, L. *Prep.* (St. B. Hosp.) Scammony, 24 grs.; ginger, 20 grs.; aloes and gamboge, of each, 12 grs.; treacle, q. s.; mix, and divide into 12 pills. A powerful cathartic and vermifuge.—*Dose.* 1 to 3 pills.

Scot's Pills. *Prep.* From aloes, 9 lbs.; jalap, 3 lbs.; gamboge and ginger, of each, ½ lb.; beaten with treacle, q. s. See ANDERSON'S SCOT'S PILLS.

Dr. Scott's Bil'ious and Liver Pills. *Prep.* (Cooley.) Compound extract of colocynth (Ph. L. 1836), 8 oz.; powdered rhubarb, 4 oz.; powdered myrrh, 2 oz.; soft soap, ½ oz.; oil of caraway, 2½ drs.; strong syrup of saffron, q. s. to form a pill-mass. "There are twenty-five 3½-gr. pills in each 1s. 1½d. box." "It has been stated that these pills contain a minute portion of antimony." ('Anat. of Quackery.')

Sed'ative Pills. *Syn.* PILULÆ SEDATIVÆ, L. *Prep.* 1. Hydrochlorate of morphia, 6 grs.; powdered sumbul, 20 grs.; alcoholic extract of Indian hemp, ½ dr. For 2-gr. pills.—*Dose.* 1 to 3, twice or thrice daily; in excessive nervous irritability, painful menstruation, &c.

2. (U. C. Hosp.) Camphor, 1 dr.; reduce it to powder by means of rectified spirit, 3 or 4 drops; add of extract of henbane, 20 grs., and divide the mass into 20 pills. To allay pain and excitement, &c.—*Dose.* 1 to 2 pills.

3. To either of the above, add of powdered rhubarb and extract of gentian, of each, 20 grs., and divide the mass into 4-gr. pills.—*Dose.* 1 to 4 pills; when, besides the other symptoms, the stomach and bowels are disordered.

Sedillot's Febrifuge Pills. *Prep.* From powdered opium, 3 grs.; sulphate of quinine, 12 grs.; confection of opium, 10 grs., or q. s. For 12 pills.—*Dose.* 1 to 2, every second hour, during the intermission of an ague.

Pills of Sen'na. *Syn.* PILULÆ SENNÆ, P. S. COMPOSITÆ, L. *Prep.* 1. Powdered senna, 1 dr.; extract of rhubarb, ½ dr.; powdered capsicum, 4 grs.; oil of juniper, 6 or 8 drops. For 3-gr. pills. An aperient well suited for females.—*Dose.* 5 to 8 pills.

2. (Hufeland.) Powdered senna, 1 dr.; extract of dandelion, q. s. to mix. For 30 pills. As the last.

Smith's Pills. *Prep.* From powdered aloes, 4 drs.; jalap, 2 drs.; ginger and soft soap, of each, 1 dr.; oil of juniper, ½ dr.; emetic tartar, 6 grs. For 120 pills. Laxative and diuretic.—*Dose.* 1 to 4, at bedtime, or early in the morning.

Dr. Hugh Smith's Pills. See STOMACH PILLS.

Pills of Soap. *Syn.* PILUTÆ SAPONIS, P. CUM SAPONE, L. *Prep.* (P. Cod.) White Castile soap, 32 parts; powdered marsh-mallow root, 4 parts; powdered nitrate of potassa, 1 part; beat them to a mass, and divide this into 4-gr. pills. In habitual costiveness, calculary affections, &c.—*Dose.* 1 to 6 pills, twice or thrice a day.

Pills of Soap (Compound). *Syn.* PILLS OF SOAP AND OPIUM, LAUDANUM PILLS; PILULA SAPONIS COMPOSITA (B. P., Ph. L.), PILULÆ SAPONIS CUM OPIO, L. *Prep.* 1. (Ph. L.) Opium and liquorice, of each (in powder), 2 drs.; soft soap (Ph. L.), 6 drs.; beat them to a uniform mass.

2. (Ph. D. & Ph. U. S.) Opium (in fine powder), ½ oz.; Castile soap, 2 oz.; distilled water, ½ fl. dr., or q. s.; reduce the soap to powder, mix it with the other ingredients, and beat the whole together, as before. See PILLS OF OPIUM.

Obs. The above pills contain 1-5th part of their weight in dry opium. The dose is 3 to 10 grs., in the usual cases in which the administration of opium is indicated. Mr. Skey, the eminent surgeon of St. Bartholomew's Hospital, has shown the great value of this pill in promoting the healing of obstinate ulcers, more especially those of the legs.

Pills of Soda. *Syn.* PILULÆ SODÆ CARBONATIS, L. *Prep.* (Ph. E. 1817.) Exsiccated carbonate of soda, 4 parts; Castile soap, 3 parts; syrup, q. s. to form a mass. Antacid and slightly laxative.—*Dose.* 10 to 20 grs. This pill was a great favourite of the once celebrated Dr. Beddoes.

Speediman's Pills. *Prep.* (Cooley.) Aloes, 3 drs.; rhubarb, myrrh, (all in powder,) and extract of chamomile, of each, 1 dr.; oil of chamomile, 20 drops. For 4-gr. pills. An excellent aperient, tonic, and stomachic.—*Dose.* 2 to 4 pills, as a purgative; 1, as a stomachic or dinner pill.

Splenet'ic Pills. *Syn.* PILULÆ ANTISPLENETICÆ, L. *Prep.* (Saunders.) Strained aloes and gum ammoniacum, of each, 3 drs.; myrrh and bryony, of each, ½ dr. For 4-gr. pills.—*Dose.* 3 to 5. "Extolled in amenorrhœa and hypochondriasis." (Dr. R. E. Griffith.)

Pills of Squill (Compound). *Syn.* COUGH PILLS, PILLS OF SQUILLS AND GINGER; PILULA SCILLÆ COMPOSITÆ (B. P., Ph. L.), PILULÆ SCILLÆ COMPOSITÆ (Ph. D.), P. SCILLÆ (Ph. E.), L. *Prep.* 1. (Ph. L.) Freshly powdered squills, 1 dr.; powdered ginger and powdered ammoniacum, of each, 2 drs.; mix, add, of soft soap (Ph. L.), 3 drs.; treacle, 1 dr.; and beat the whole together, so that a mass may be formed.

2. (Ph. E.) Squills, 5 parts; ammoniacum, ginger, (all in fine powder,) and Spanish soap, of each, 4 parts; conserve of red roses, 2 parts; mix, as before, and divide the mass into 5-gr. pills.

3. (Ph. D.) Squills (in fine powder), 2½ drs.; ammoniacum, ginger, and Castile soap, of each (in fine powder), 2 drs.; treacle, ½ oz.

4. (B. P.) Squill (in fine powder), 1¼; ginger (in fine powder), 1; ammoniacum (in powder), 1; hard soap (in powder), 1; treacle (by weight), 2, or a sufficiency; mix the powders, add the treacle, and beat into a mass.—*Dose.* 5 to 10 grains.

Obs. Compound squill pill is a most useful expectorant, in chronic coughs, asthmas, bronchial affections, difficulty of breathing, &c.; and, combined with calomel and foxglove, and, occasionally, with croton oil, as a diuretic, &c., in dropsies. Unfortunately, however, it soon spoils; and, therefore, to be effective as a remedy, it must be recently prepared. As an expectorant, it should not be administered until the inflammatory symptoms have been subdued by purgatives or bleeding. A little powdered opium, or extract of henbane, is occasionally added, to allay irritation.—*Dose.* 5 to 20 grs., twice or thrice a day, accompanied by an occasional aperient.

Stahl's Pills. See APERIENT PILLS.

Starkey's Pills. *Prep.* (Original formula.) Extract of opium, 4 oz.; mineral benzoar and nutmeg, of each, 2 oz.; saffron and Virginian snake-root, of each, 1 oz.; Starkey's soap, ½ lb.; oil of sassafras, ½ oz.; tincture of antimony (Old Ph.), 2 fl. oz. Anodyne, diaphoretic, &c.—*Dose.* 3 to 10 grs. The formula already given under MATTHEW'S PILLS is erroneously assigned to this pill by some writers.

Mrs. Stephen's Pills. This once celebrated remedy for stone was prepared from the calcined shells of eggs and snails, made into 3-gr. pills with soft soap. Its active ingredients were, consequently, lime and potash.

Stim'ulant Pills. *Syn.* PILULÆ STIMULANTES, L. *Prep.* 1. Capsicum, ½ dr.; nitrate of silver, 2 grs.; conserve of hips, q. s. For 12 pills.—*Dose.* 2 to 4, washed down with a spoonful of warm spirit-and-water, and repeated hourly, until reaction ensues; in cholera, &c.

2. (A. T. Thomson.) Strychnine, 1 gr.; acetic acid, 1 drop; crum of bread, 20 grs.; mix very carefully, and divide the mass into 10 pills.—*Dose.* 1, every six hours; in paralysis arising from lead.

Stoerck's Pills. *Syn.* PILULÆ CONII, P. CICUTÆ, L. *Prep.* From extract of hemlock, 1 dr.; powdered hemlock, q. s. to make a mass. For 2-gr. pills.—*Dose.* 1 to 4, twice a day; in various glandular and visceral enlargements, pulmonary affections, cancer, scrofula, neuralgia, &c.

Stomach Pills. *Syn.* PILULÆ STOMACHICÆ, L. *Prep.* 1. Ipecacuanha, 10 grs.; sumbul and extract of rhubarb, of each, 30 grs.; powdered quassia, 20 grs.; oil of sassafras, 6 drops; beaten up with essence of ginger (strongest), q. s. For 3-gr. pills.—*Dose.* 1 to 3, thrice daily; in loss of appetite, flatulence, dyspepsia, &c.

2. (Dr. Hugh Smith's.) From aloes, rhubarb, ginger, (all powdered,) and sagapenum,

of each, 1 dr.; oils of peppermint and cloves, of each, 10 drops; balsam of Peru, q. s. to mix. For 5-gr. pills.—*Dose.* 2 or 3 nightly; or 1 to 2, before dinner. For other formulæ, see DINNER, APERIENT, COMPOUND RHUBARB, ALOES AND MASTIC PILLS, &c.

Pills of Sto'rax (Compound). *Syn.* STORAX PILLS; PILULA STYRACIS COMPOSITA (Ph. L.), PILULÆ STYRACIS (Ph. E.), L. *Prep.* 1. (Ph. L.) Prepared storax, 6 drs.; saffron and powdered opium, of each, 2 drs.; beat them together to a uniform mass. Contains 1-5th of its weight of opium.

2. (Ph. E.) Opium and saffron, of each, 1 part; extract of styrax, 2 parts; beat them to a uniform mass, and divide this into 4-gr. pills. Contains 1-4th part of opium.

Obs. The storax is here chiefly employed to disguise the odour and taste of opium. The name of the preparation has been chosen so that the word 'opium' may not appear in the prescription, a point highly necessary with certain patients.—*Dose.* 3 to 10 grs.; as compound soap pill, and as an anodyne and expectorant in chronic coughs, &c.

Pills of Stramo"nium. *Syn.* PILULÆ STRAMONII, L. *Prep.* 1. Stramonium seeds (in powder), 12 grs. (or leaves, 25 grs.); powdered camphor and extract of seneka root, of each, 1 dr.; powdered savine, 1½ dr.; oil of cajeput, 15 drops. For 2½-gr. pills.—*Dose.* 2 to 4, thrice daily; in rheumatism, &c.

2. (Sir H. Halford.) Extract of stramonium and liquorice powder, of each, 1 dr.; powdered Castile soap, 2 drs.; mucilage, q. s. to mix. For 60 pills.—*Dose.* 1, night and morning; in asthmas, &c.

Pills of Strych'nine. *Syn.* PILULÆ STRYCHNIÆ, L. *Prep.* (Magendie.) Strychnine, 2 grs.; conserve of hips, 36 grs.; (liquorice powder, q. s.;) mix very carefully, divide the mass into 24 pills, and silver them.—*Dose.* 1 pill, night and morning; in amaurosis, impotence, paralysis, &c.

Pills of Sul'phate of I'ron. *Syn.* PILULÆ FERRI SULPHATIS (Ph. E.), L. *Prep.* 1. (Ph. E.) Dried sulphate of iron and conserve of red roses, of each 2 parts; extract of dandelion, 5 parts. For 5-gr. pills. A useful chalybeate tonic.—*Dose,* 1 to 2, twice or thrice daily; in dyspepsia, chlorosis, amenorrhœa, &c.

2. (Ph. E. 1817.) Sulphate of iron (dried), 1 oz.; extract of chamomile, 1½ oz.; oil of peppermint, 1 dr.; syrup, q. s. As the last.

3. (Ph. U. S.) As No. 1, but substituting extract of gentian for extract of dandelion. For other formulæ, see HOOPER'S PILLS, &c.

Pills of Sulphate of Quinine'. *Syn.* PILULÆ QUINIÆ SULPHATIS, P. Q. DISULPHATIS, L. *Prep.* 1. Sulphate of quinine, 20 grs.; extract of gentian, 40 grs. For 20 pills.

2. (Ph. U. S.) Sulphate of quinine, 2 drs.; powdered gum, ½ dr.; strained honey, q. s. For *pills.* Each pill contains 1 gr. of the ulphate of quinine.—Dose. 1 or 2, twice a day, as a tonic and stomachic; 6 to 12, every two or three hours, during the remissions of agues.

Obs. Various additions are often made to the above formulæ, according to the indications, by which numerous other useful pills are produced. Thus, potassio-tartrate of antimony is frequently added in obstinate intermittents; iodide of potassium, in scrofulous affections; foxglove, in the hectic fever of phthisis; bitter tonics and aromatics, in dyspepsia, flatulence, &c.; carbonate of soda or magnesia, in acidity and heartburn; calomel, mercurial pill, in bilious affections; rhubarb and aloes, in bowelly affections; sulphate of iron and other chalybeates, in debility, amenorrhœa, and chlorosis; calomel, as an alterative; &c., &c.

Pills of Sulphate of Zinc. *Syn.* PILULÆ ZINCI SULPHATIS, P. Z. S. COMPOSITÆ, L. *Prep.* 1. Sulphate of zinc, 12 grs.; extract of gentian, ½ dr.; liquorice powder, q. s. For 20 pills. In dyspepsia, epilepsy, and various convulsive diseases.

2. (Dr. Paris.) Sulphate of zinc, 10 grs.; powdered myrrh, 1½ dr.; conserve of roses, q. s. For 30 pills.—*Dose.* 1 to 2, twice or thrice daily; in hooping-cough, &c.

Pills, Syph'ilis. *Syn.* PILULÆ ANTISYPHILITICÆ, L. See the various pills of mercury, gold, &c. The pills of corrosive sublimate commonly pass under this name.

Pills, Tangore. See ARSENICAL PILLS.

Pills of Tan'nic Acid. *Syn.* PILULÆ TANNINI, P. ACIDI TANNICI, L. *Prep.* From tannic acid or tannin and powdered sugar, of each, ½ dr.; conserve of roses, q. s. For 24 pills. —*Dose.* 1 or 2 pills, thrice daily, in diarrhœa; or 2, every three hours, in internal hæmorrhages, spitting of blood, &c.

Pills of Tar. *Syn.* PILULÆ PICIS LIQUIDÆ, L. *Prep.* From tar, 1 dr.; powdered gentian, ½ dr., or q. s. For 24 pills. Stimulant, diuretic, and sudorific.—*Dose.* 1 to 4, thrice a day; in dropsies, worms, ichthyosis, and several other skin diseases, &c.

Pills of Tarax'acum. *Syn.* PILULÆ TARAXACI, L. *Prep.* 1. Extract of dandelion, 1 dr.; powdered rhubarb, q. s.; divide into 3½-gr. pills. In dyspepsia, &c., complicated with congestion of the liver.

2. (St. Marie.) Extract of dandelion and Castile soap, equal parts; liquid acetate of potassa, q. s. to mix. For 4-gr. pills. As a diuretic in dropsy.

3. Extract of dandelion, 1 dr.; mercurial pill, 20 grs.; powdered digitalis, 15 grs.; liquorice powder, q. s. For 24 pills.—*Dose.* 1, afterwards increased to 2 or 3; in dropsy connected with liver disease.

Pills, Thomson's Stomach and Liver. *Prep.* From extract of dandelion, 1 dr.; scammony and rhubarb, of each, 15 grs. For 14 pills.—*Dose.* 2 pills, night and morning; in hysteria, hypochondriasis, and chronic inflammation of the liver or kidneys.

Pills, Tonic. *Syn.* PILULÆ TONICÆ, L. *Prep.* 1. Sulphate of iron, ginger, and myrrh, (all in powder,) equal parts; conserve of roses, q. s.; mix, and divide into 4-gr. pills.—*Dose.* 1, twice a day; in debility, chlorosis, &c.

2. Powdered myrrh and sulphate of iron, of each, 1 dr.; disulphate of quinine, ½ dr.; powdered capsicum, 15 grs.; conserve of roses, q. s. to mix. For 60 pills.—*Dose.* 1 or 2, twice or thrice a day; in debility, dyspepsia, ague, &c.

3. (Dr. Collier.) Tartrate of iron and extract of gentian, of each, 1 dr.; oil of cinnamon, 2 drops. For 30 pills.—*Dose.* 3 to 6, three or four times a day. A good stomachic tonic.

4. (Dr. Collier.) Oxide of zinc, ½ dr. (or sulphate of zinc, 20 grs.); myrrh, 2 drs.; camphor, 20 grs.; confection of hips, to mix. For 40 pills.—*Dose.* 1 or two pills, three times a day; in epilepsy, chorea, and other nervous disorders, debility, &c.

5. (Dr. A. T. Thomson.) Rhubarb and ginger, of each, ½ dr.; extract of chamomile, 1 dr.; divide into 30 pills.—*Dose.* 2 or 3, twice a day; in dyspepsia and chlorosis.

6. (Dr. A. T. Thomson.) Sesquioxide of iron and extract of hemlock, of each, 1 dr.; mix, and divide into 20 pills.—*Dose.* 1 or 2, twice a day; in fluor albus, scrofula, &c. Several other formulæ for tonic pills will be found under the names of the leading ingredients, &c. (See *above.*)

Pills of Vale′′rian (Compound). *Syn.* PILULÆ VALERIANÆ COMPOSITÆ, L. *Prep.* (Dupuytren.) Powdered valerian, ½ dr.; castor and white oxide of zinc, of each, 20 grs.; syrup, q. s. to mix. For 18 pills.—*Dose.* 2 or 3, thrice daily; in hysteria, hypochondriasis, chlorosis, hemicrania, &c.

Pills of Vale′′rianate of Zinc. *Syn.* PILULÆ VALERIANAS, L. *Prep.* From valerianate of zinc and powdered gum, of each, 15 grs.; conserve of hips, q. s. to form a mass. For 18 pills. *Dose.* 1 pill, twice daily; in nervous headache, neuralgia, hysteria, &c.

Pills, Vallet's. See PILLS OF CARBONATE OF IRON.

Pills, Vance's. See APERIENT PILLS.

Pills of Vera′trine. *Syn.* PILULÆ VERATRINÆ, L. *Prep.* 1. (Magendie.) Veratrine, ½ gr.; powdered gum arabic and syrup of gum, of each, q. s. to form 6 pills. (See *below.*)

2. (Turnbull.) Veratrine, 1 gr.; extract of henbane and liquorice powder, of each, 12 grs.; mik, and divide into 12 pills.—*Dose.* 1 pill, every 3 hours; in dropsy, epilepsy, hysteria, paralysis, nervous palpitations, &c. This should be prepared and used with great caution.

Pills, Ward's Red. *Syn.* WARD'S ANTIMONIAL PILLS. *Prep.* From glass of antimony (finely levigated), 4 oz.; dragon's blood, 1 oz.; mountain wine, q. s. to form a mass. For 1½-gr. pills. Emetic. "They are recommended in obstinate rheumatic affections, in foulness of the stomach and bowels, &c. Their action is often of a very unpleasant character." ('Anat. of Quackery.')

Pills, Lady Webster's. See DINNER PILLS.

Pills, Whitehead's Essence of Mustard. Balsam of tolu, with resin. (Dr. Paris.)

Pills, Whytt's. *Prep.* (Radius.) Aloes, chloride of iron, and extract of horehound, of each ½ dr.; assafœtida, 1½ dr. For 2-gr. pills. —*Dose.* 2 to 5, thrice daily; in leucorrhœa, chlorosis, hysteria, &c., with constipation.

Pills, Worm. *Syn.* PILULÆ ANTHELMINTICÆ, P. VERMIFUGÆ, L. *Prep.* 1. Calomel, 1 oz.; sugar, 1½ oz.; mucilage, q. s.; mix, and divide into 240 pills.—*Dose.* 1 to 2, overnight, followed by a strong dose of castor oil early the next morning.

2. Gamboge, 6 grs.; calomel, 5 grs.; mucilage, q. s.; divide into 3 pills. For a morning's dose, fasting.

3. Extract of wormwood, calomel, and powdered scammony, equal parts. For 4-gr. pills. —*Dose.* 2 to 1, as the last. For ascarides, and other small worms.

4. (Bresmer.) Powdered aloes and tansy seed, of each, ½ dr.; oil of rue, 9 or 10 drops. For 12 pills.—*Dose.* 3 to 6, in the morning, fasting, and repeated in two or three hours.

5. (Phœbus.) Iron filings, ½ dr.; assafœtida, 1½ dr.; essential oil of tansy, 10 or 12 drops; extract of wormwood, q. s.; mix, and divide into 80 pills. *Dose.* 6 pills, thrice daily.

6. (Peschier.) Ethereal extract of male fern, 30 drops; extract of dandelion, 1 dr.; powdered rhizomes of male fern, q. s. to mix. For 30 pills. In tape-worm.—*Dose.* 6 to 15, at bedtime; the dose being repeated in the morning, and then followed in an hour by a strong dose of castor oil.

Pills, Wordsell's (Kaye's). *Prep.* (Cooley.) Powdered aloes, gamboge, and ginger, equal parts; together with a very small quantity of diaphoretic antimony, beaten into a mass with either syrup or treacle, and divided into 2½-gr. pills. "There are about 4½ dozen pills in each 1s. 1½d. box." "The *dose,* as given in the directions, is from 2 to 8 pills (or even 10 to 12) daily." ('Anat. of Quackery.') They frequently operate with great violence.

Pills, Wyndham's (Lee's). *Prep.* (Cooley.) Aloes and gamboge, of each (in powder), 3 oz.; Castile soap and extract of cow-parsnip, of each, 1 oz.; nitre, ½ oz. For 5-gr. pills. A powerful drastic cathartic.—*Dose.* 1 to 3 pills.

Pills of Zinc. See PILLS OF OXIDE, SULPHATE, and VALERIANATE OF ZINC, &c.

PIMAR′IC ACID. A resin acid first obtained by Laurent from the turpentine of *Pinus maritima* (Bordeaux turpentine), by the action of hot alcohol.

PIMEN′TO. *Syn.* ALLSPICE, CLOVE PEPPER, JAMAICA P., PIMENTO BERRIES; PIMENTA (B.P., Ph. L. E. & D.), PIPER CARYOPHYLLATUM, P. JAMAICENSE, P. ODORATUM, PIMENTÆ

BACCÆ, L. "The dried unripe berries of the allspice tree, *Eugenia pimenta*, from the West Indies"—B. P. "The immature fruit of *Eugenia pimenta* (Myrtus pimenta, *Linn.*)"—Ph. L. It possesses a mixed odour of cinnamon, cloves, and nutmegs, which, with its other properties, it for the most yields to alcohol, ether, and water. It is a stimulant and tonic, and is much esteemed as an adjuvant in medicines prescribed in dyspepsia, flatulence, gout, hysteria, &c.; and also to cover the taste of disagreeable medicines.—*Dose.* 5 to 30 grs., bruised or in powder. See ESSENCE, OILS (Volatile), SPIRITS, and WATERS.

PIM'PLES. See ERUPTIONS (Papular).

PINCH'BECK. A gold-like alloy of copper and zinc. See DUTCH GOLD.

PINE APPLE. *Syn.* ANANAS. The fruit of *Ananassa sativa*, a plant of the natural order *Bromeliaceæ*. It is astringent, esculent, and possesses a rich flavour and odour. In Europe it is chiefly used as a delicacy for the table; but in tropical climates it is said to be valuable in renal diseases. See ESSENCE, &c.

PI'NEY TAL'LOW. *Syn.* PINEY RESIN, P. DAMMAR. An oleo-resinous substance obtained from the fruit of *Vateria indica*, a tree common in Malabar, by boiling it with water. It is intermediate between fat and wax, makes good soap and excellent candles. It melts at 98° Fahr. Sp. gr. ·9250 to ·9265.

PI'NIC ACID. The portion of common resin or colophony which is soluble in cold alcohol of sp. gr. ·833.

PINK. A well-known shade of light red. The name is also applied to several pigments, consisting of whiting stained with liquid dyes. See RED and YELLOW PIGMENTS, &c.

PINK DYE. *Prep.* From washed safflower, 2 oz.; salt of tartar, ½ oz.; cold water, 1 quart; digest for 3 hours, express the liquor, and strain it. *Used* as a cosmetic, and to dye silk stockings, &c., of a rose colour. The colour is brought out by afterwards applying to, or passing the articles through, water soured with lemon juice. See SAUCERS (Pink).

PIP'ERINE. $C_{17}H_{19}NO_3$. *Syn.* PIPERINA, PIPERINUM, L. *Prep.* (P. Cod.) Alcoholic extract of black pepper is treated with a weak solution of caustic potassa (1 to 100), and the residuum, after being washed with cold water, is dissolved in alcohol; the solution is next agitated with a little animal charcoal, and the filtrate is allowed to evaporate spontaneously; the product may be purified by the re-solution in alcohol, and re-crystallisation.

Prop., &c. Colourless, or only slightly yellow; tasteless; inodorous; fusible; and crystallisable; insoluble in water; freely soluble in strong spirit, and in the acids; very feebly basic; (a few definite compounds have, however, been obtained with difficulty;) reddened by oil of vitriol. It has been much employed in Italy and on the Continent as a febrifuge.—*Dose.* 2 to 10 grs., frequently repeated, during *the apyrexia of* intermittents.

Obs. An assay for its piperine is the only certain method of testing the quality of either black or white pepper. For this purpose a weighted quantity of the sample is reduced to powder, and is exhausted with alcohol of the sp. gr. ·833; the mixed tinctures are then evaporated to an extract, which is treated as above. See PEPPER.

PIPES. (In confectionery.) These are formed from any of the common lozenge-masses, by rolling them into cylinders of about the thickness of a goose-quill. They are frequently medicated.

PISTA'CHIO NUTS. *Syn.* PISTACIA NUTS; NUCES PISTACIÆ, L. The kernels of the fruit of *Piscatia vera* (Linn.), one of the turpentine trees. They closely resemble almonds, but are sweeter, and form a green emulsion with water. *Used* in confectionery and perfumery, and also as a dessert fruit.

PITCH. *Syn.* BLACK PITCH, BOILED P., STONE P., WOOD P.; PIX (Ph. L.), PIX NIGRA, L. "A dry bitumen prepared from liquid pitch." (Ph. L.) The residuum from boiling tar in an open iron pot, or in a still, until the volatile and liquid portion is driven off. The volatile products principally consist of crude pyroligneous acid and oil of tar. Pitch is chiefly employed in ship-building. As a medicine, it is stimulant and tonic, and has been used internally in some skin diseases, and in piles. An ointment made of it is also extensively used in cutaneous affections of the scalp.—*Dose.* 10 grs. to ½ dr.

Burgundy Pitch. *Syn.* WHITE PITCH, BURGUNDY PINE RESIN; PIX BURGUNDICA, (B.P., Ph. L. E. & D.), L. "Impure resin prepared from the turpentine of *Abies excelsa*," or Norway spruce fir. (Ph. L.) "A concrete resinous exudation, probably, in a great measure, from *Abies excelsa*. (Ph. E.) It is chiefly used in plasters.

Obs. The importation of this substance has for some years past been gradually lessening in amount, in consequence of the substitution for it of a fictitious pitch, made by melting common resin with linseed oil, and colouring the mass with annotta or palm oil. The physiological action of the two articles is, however, considerably different, since Burgundy pitch acts upon the skin as a powerful local irritant, exciting a slight degree of inflammation, and not unfrequently producing a pimply eruption and an exudation of purulent matter. It is celebrated for its effects when employed as a plaster in all cases where warmth, support, and long adhesion to the skin, are desirable; and in the latter quality no substance equals it. The factitious Burgundy pitch has similar properties, but in an immensely less degree.

PREPARED BURGUNDY PITCH (PIX BURGUNDICA PRÆPARATA—Ph. L.) is ordered to be obtained in the same way as that adopted for strained ammoniacum. This plan is, however, seldom, if ever, adopted in trade.

Burgundy Pitch (Facti''tious). *Syn.* Pix Burgundica factitia, L. *Prep.* By melting good yellow resin, 1 cwt., with linseed oil, 1 gall., and palm oil (bright), q. s. to colour. The mixture is allowed to cool considerably, and is then pulled with the hands in the same way as lead plaster is treated; after which it is placed in 'bladders' or 'stands' for sale.

Obs. The product of the above formula is the 'Burgundy pitch' of the shops. The 'pulling' or 'working' destroys the translucency of the resin, and imparts to it the peculiar semi-opacity of foreign Burgundy pitch. Cold water is commonly employed to cool it down. Annotta is often substituted for palm oil as a colouring substance. The addition of some of the 'droppings' or 'bottoms' of Canada balsam, Chio turpentine, oil of juniper, &c., renders this article nearly equal to foreign pitch; but in commerce this is never attempted, the aim being only the production of a lively colour with moderate toughness. A common melting-pan and fire (if clean, and carefully managed) will succeed sufficiently; but, both for safety and convenience, steam is preferable, and on the large scale, almost indispensable. A good workman can pull and put into stands or casks about 5 cwt. daily; or from 1½ cwt. to 3 cwt. in bladders, the latter quantity depending on the size of the bladders. (See *above.*)

Can'ada Pitch. *Syn.* Hemlock gum, H. pitch. Similar to Burgundy pitch; but from the *Abies Canadenses*, or hemlock spruce fir.

Jews' Pitch. Asphaltum.

Min'eral Pitch. Indurated mineral bitumen. See Asphaltum, Bitumen, &c.

PIT'COAL. *Syn.* Coal; Houille, Fr.; Steinkohle, Ger. This article has been truly described as the most valuable of all those mineral substances from which Great Britain derives its prosperity, and the one which may be regarded as the main support of the whole system of British production. It fuses the metals, it produces the steam which sets our machinery in motion, and, in short, it may be said to render all the resources of this country available for use.

The more important kinds of coal may be classified as follows:—1. Lignite or brown coal (see page 691).—2. Bituminous or caking coals. The most widely diffused and valuable of English coals. They are subdivided into:—*a.* Caking coal. Splinters on heating, but the fragments then fuse together in a semipasty mass. The chief sources of this valuable variety of coal are the Newcastle and Wigan districts. *b.* Cherry coal or soft coal. Lustre very bright; does not fuse, ignites well and burns rapidly. Glasgow, Staffordshire, Derbyshire, Nottingham, Lancashire, &c. *c.* Splint, rough, or hard coal. Black and glistening; does not ignite readily, but burns up to a clear hot fire. It constitutes the bulk of the great coal fields of North and South Staffordshire, and occurs in the Glasgow district, in Shropshire, Leicestershire, Warwickshire, &c. *d.* Cannel or parrot coal. Dense and compact, having a shelly fracture, and taking a polish-like jet. Splinters in the fire, and burns clearly and brightly. Wigan and other parts of Lancashire, West Glasgow, &c. The curious deposit at Bathgate, near Edinburgh, commonly known as 'Boghead cannel coal,' or 'Torbanehill mineral,' differs considerably from the ordinary 'cannels.'—3. Anthracite or stone-coal. The densest, hardest, and most lustrous of all kinds of pit-coal. Burns with little flame or smoke, but gives great heat. South Wales, Devonshire, &c.—4. Steam coal. Approaches nearly to anthracite. Admirably adapted for steam-vessels. South Wales, Tyne district. &c.

The quality of coal may be ascertained by either directly testing its heating power or by chemical analysis. In the investigations undertaken at the Museum of Economic Geology, under the directions of Sir H. De la Beche, and which furnished the materials for the celebrated 'Admiralty Reports,' three different methods were adopted for this purpose.[1] These consisted in—the determination of the quantity of water which a given weight of the coal was capable of converting into steam—the quantity of litharge which it was capable of reducing to the metalic state, and, lastly,—its ultimate analysis by combustion with oxide of copper. See Organic Substances.

The quantity of sulphur in coal is another matter of importance that may be determined by chemical analysis. (See Sulphur.) The presence of more than 1% of sulphur renders coal unfit for the economical production of good light-gas, and more than 2% of sulphur renders it objectionable for use as domestic fuel. In like manner, coals containing mineral ingredients in excess are to be avoided, not merely on account of the quantity of ashes left by them, but for their tendency to vitrify upon the bars of the furnace, and to produce what is technically called 'clinkers.' The presence of much silica or alumina, and more particularly of any of the salts of lime, in 'steam coal,' is, on this account, highly objectionable.

For some further information connected with this subject, see Anthracite, Chimneys, Coke, Fuel, Gas, Lignite, Oils, (Mineral), Organic Substances, &c.

PLAICE. The *Platessa vulgaris*, a well-known flat fish, common to both the English and Dutch coasts. Its flesh is good, and easy of digestion, but more watery than that of the flounder.

PLAS'TER. (In building, &c.) See Mortar.

Plaster of Paris. Calcined sulphate of lime. See Alabaster, Gypsum, Lime, &c.

PLASTER. (In pharmacy.) *Syn.* Em-

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[1] See Watts's 'Dict. of Chemistry,' vol.

PLASTRUM, L. Plasters (emplastra) are external applications that possess sufficient consistence not to adhere to the fingers when cold, but which become soft and adhesive at the temperature of the human body.

Plasters are chiefly composed of unctuous substances united to metallic oxides, or to powders, wax, or resin. They are usually formed, whilst warm, into ½-lb. rolls, about 8 or 9 inches long, and wrapped in paper. When required for use, a little is melted off the roll by means of a heated iron spatula, and spread upon leather, linen, or silk. The less adhesive plasters, when spread, are usually surrounded with a margin of resin plaster, to cause them to adhere.

In the preparation of plasters, the heat of a water bath, or of steam, should alone be employed. On the large scale, well-cleaned and polished copper or tinned copper pans, surrounded with iron jackets, supplied with high-pressure steam, are used for this purpose. The resins and gum resins that enter into their composition are previously purified by straining. After the ingredients are mixed, and the mass has acquired sufficient consistence by cooling, portions of it are taken into the hands, anointed with a little olive oil, and well pulled or worked until it becomes solid enough to admit of being formed into rolls. To promote the cooling of the plaster it is usual to plunge it into cold water, and to expose it to the action of the fluid by working it about under the surface, after which it is well pulled in the hands to remove the superfluous water; but this process must not, on any account, be practised on compound plasters, containing odorous substances, or substances soluble in water. These should be suffered to cool on an oiled marble slap, until sufficiently 'stiff' to be formed into rolls. Many plasters, as those of lead and resin, derive much of their whiteness and beauty from the treatment just referred to. White plasters are not, however, always the best; but they are those which are most admired, and the most sought after in trade.

Plasters are preserved by enveloping the rolls with paper, to exclude the air as much as possible, and by keeping them in a cool situation. A few, as those of belladonna and ammoniacum with mercury, are commonly placed in pots. When kept for any length of time, they are all more or less apt to become hard and brittle, and to lose their colour. When this is the case, they should be remelted by a gentle heat, and sufficient oil added to the mass to restore it to a proper consistence.

The operation of spreading plasters for use requires skill and experience on the part of the operator. Various textures are employed for the purpose, of which linen or cotton cloth, or leather, are those most generally employed. Silk and satin are used for 'court plaster.' The shape and size must be regulated by the part to which they are to be applied.

On the large scale plasters are spread by means of a 'spreading machine.'

Compound plasters are now much less frequently employed in medicine than formerly. Those principally in use are such as afford protection to sores and abraded surfaces, and give support to the parts. A few, however, which contain acrid, stimulating, and narcotic substances, and operate as rubefacients, blisters, or anodynes, are still retained in the Pharmacopœias.

Plaster of Ac′onite. *Syn.* EMPLASTRUM ACONITI, L. *Prep.* (Curtis.) Gently evaporate tincture of aconite to the consistence of a soft extract, then spread a very small portion over the surface of a common adhesive plaster, on either calico or leather. Mr. Curtis has strongly recommended this plaster in neuralgia. A little of the alcoholic extract may be employed instead of that obtained fresh from the tincture.

Adhe″rent Plaster. See SOAP PLASTER (Compound).

Adhe′sive Plaster. See RESIN PLASTER, COURT P., &c.

Ammoni′acal Plaster. *Syn.* DR. KIRKLAND'S VOLATILE PLASTER; EMPLASTRUM AMMONIÆ, E. A. HYDROCHLORATIS, L. *Prep.* Take of lead plaster, 1 oz.; white soap (shaved fine), ½ oz.; melt them together, and, when nearly cold, add of sal ammoniac (in fine powder), 1 dr. Stimulant and rubefacient. Dr. Paris, who highly recommends it in pulmonary affections, employs double the above proportion of sal ammoniac. Its efficacy depends on the gradual extrication of free ammonia by the decomposition of the sal ammoniac, on which account it is proper to renew the application of it every 24 hours.

Plaster of Ammoni′acum. *Syn.* EMPLASTRUM AMMONIACI (Ph. L. E. & D.), L. *Prep.* 1. (Ph. L. & E.) Ammoniacum (strained), 5 oz.; dilute acetic acid (distilled vinegar), 8 fl. oz. (9 fl. oz.—Ph. E.); dissolve, and, frequently stirring, evaporate by a gentle heat, to a proper consistence.

2. (Ph. D.) Gum ammoniacum (in coarse powder), 4 oz.; proof spirit, 4 fl. oz.; dissolve by the aid of a gentle heat, and evaporate, as before.

Obs. This plaster is adhesive, stimulant, and resolvent, and is employed in scrofulous and indolent tumours, white swellings, &c. In the Ph. D. 1826 vinegar of squills was ordered instead of distilled vinegar.

Plaster of Ammoniacum with Hem′lock. *Syn.* EMPLASTRUM AMMONIACI CUM CICUTÂ, L. *Prep.* (Ph. E. 1744.) Gum ammoniacum, 8 oz.; vinegar of squills, q. s. to dissolve; hemlock juice, 4 oz.; gently evaporate, as before. In cancerous and other painful tumours. A better plan is to add 1 dr. of extract of hemlock to 1¼ oz. of strained ammoniacum (previously reduced to a proper consistence with a little distilled vinegar), melted by a very gentle heat.

Plaster of Ammoniacum with Mer'cury. *Syn.* EMPLASTRUM AMMONIACI CUM HYDRARGYRO (B. P., Ph. L. E. & D.), L. *Prep.* 1. (Ph. L. & E.) Olive oil, 1 dr.; heat it in a mortar, add of sulphur, 8 grs.; triturate; further add of mercury, 3 oz.; again triturate, and, when the globules are extinguished, add it to ammoniacum (strained), 1 lb. (12 oz., B. P.), previously melted by a gentle heat, and mix them well together.

2. (Ph. D.) From ammoniacum plaster, 4 oz.; mercurial plaster, 8 oz.; melted together by a gentle heat, and then stirred constantly until nearly cold.

3. (*Wholesale.*) Take of mercury, 38 oz.; prepared sevum, 5 oz.; triturate, as last, and add the mixture to strained ammoniacum, 10 lbs., previously sufficiently softened by a gentle heat. Possesses a fine blue colour, and is quickly made.

Obs. This plaster cannot be rolled till considerably cooled, and neither this nor the simple plaster must be put into water. It is powerfully discutient, and is applied to indurated glands, indolent tumours, &c.

An'odyne Plaster. See OPIUM PLASTER, BELLADONNA P., &c.

Antimo"nial Plaster. *Syn.* EMPLASTRUM ANTIMONIALE, E. ANTIMONII POTASSIO-TARTRATIS, L. *Prep.* (U. C. Hosp.) By sprinkling tartar emetic, in very fine powder, on the surface of a spread Burgundy pitch (or common adhesive) plaster. It has been successfully applied to the nape of the neck, in the scarlatina of children; also the chest, in phthisis; and, with the addition of a little opium, in rheumatic affections of the joints.

Aromat'ic Plaster. *Syn.* STOMACH PLASTER; EMPLASTRUM AROMATICUM, L. *Prep.* (Ph. D. 1826.) Strained frankincense (thus), 3 oz.; bees' wax, ½ oz.; melt them together, and, when the mass has considerably healed, add, of powdered cinnamon, 6 drs.; oils of allspice and lemons, of each 2 drs. Stimulant; applied over the stomach in dyspepsia, spasms, nausea, flatulence, &c. Camphor, 1 dr., is commonly added.

Plaster of Assafœtida. *Syn.* ANTIHYSTERIC PLASTER, ANTISPASMODIC P.; EMPLASTRUM ASSAFŒTIDÆ (Ph. E.), E. ANTIHYSTERICUM, &c., L. *Prep.* (Ph. E.) From lead plaster and strained assafœtida, of each, 2 oz.; strained galbanum and bees'-wax, of each, 1 oz.; melted together. Antispasmodic; applied to the stomach or abdomen in spasms, hysteria, &c.; and to the chest in hooping-cough.

Baynton's Adhesive Plaster. *Prep.* From yellow resin, 1 oz.; lead plaster, 1 lb.; melted together. Recommended for bad legs, and other like sores.

Plaster of Belladon'na. *Syn.* EMPLASTRUM BELLADONNÆ (B. P., Ph. L. E. & D.), L. *Prep.* 1. (Ph. L.) Soap plaster, 3 oz.; melt it by the heat of a water bath; add of extract of belladonna (deadly nightshade), 3 oz.; and keep constantly stirring the mixture until it acquires a proper consistence.

2. (Ph. E.) Resin plaster, 3 oz.; extract of belladonna, 1½ oz.; as the last.

3. (Ph. D.) Resin plaster, 2 oz.; extract of belladonna, 1 oz.

4. (B. P.) Extract of belladonna, 3; resin plaster, 3; rectified spirit, 6; rub the extract and spirit together in a mortar, and when the insoluble matter has subsided, decant the clear solution, remove the spirit by distillation or evaporation, and mix the alcoholic extract thus obtained with the resin plaster melted at the heat of a water bath, continuing the heat until with constant stirring the plaster has acquired a suitable consistence.

Uses, &c. As a powerful anodyne and antispasmodic; in neuralgia and rheumatic pains, and as an application to painful tumours. The plaster of the shops is usually deficient in extract. The following formula is in common use in the wholesale trade:—Lead plaster and resin plaster, of each, 2½ lbs.; extract of belladonna, 1¾ lb. This plaster must not be 'pulled' in water.

Berg's Antirheumat'ic Plaster. *Syn.* GOUT PAPER; EMPLASTRUM ANTIRHEUMATICUM, CHARTA ANTIRHEUMATICA, L. *Prep.* By digesting euphorbium, 2 parts, and cantharides, 1 part, (both in powder,) in rectified spirit, 10 parts, for eight days; adding to the strained liquid, black resin and Venetian turpentine, of each, 4 parts; assisting the mixture by a gentle heat. Two or three coats of the product are successively spread over the surface of thin paper. *Used* in gout and rheumatism. ('Anat. of Quackery.')

Black Diach'ylon Plaster. See COURT PLASTER.

Plaster of Black Pitch. *Syn.* EMPLASTRUM PICIS NIGRÆ, L. *Prep.* (Ph. Wirtem.) Black pitch, black resin, and bees' wax, of each, 8 parts; suet, 1 part; melted together. Rubefacient and stimulant.

Blistering Plaster. See PLASTER OF CANTHARIDES.

Bree's Antiasthmatic Plaster. *Prep.* From lead plaster, 1 oz.; olive oil, 1 dr.; melted together, and, when somewhat cooled, mixed with powdered camphor, 2 drs.; powdered opium, 1 dr., and at once spread on leather.

Brown Plaster. *Syn.* EMPLASTRUM FUSCUM, L.; ONGUENT DE LA MÈRE, Fr. This is noticed at page 862. The butter, lard, oil, suet, and wax, should be first melted together, and the heat gradually increased until they begin to smoke; the litharge is then to be sifted in, and the stirring and heat continued until the mixture assumes a brown colour; the pitch is next added, and the whole stirred for some time longer.

Brown Diach'ylon Plaster. See PLASTER OF GALBANUM.

Plaster of Bur'gundy Pitch. *Syn.* CEPHALIC PLASTER, BREATH P.; EMPLASTRUM PICIS

(B. P., Ph. L. & E.), E. P. COMPOSITUM, E. P. BURGUNDICÆ, L. *Prep.* 1. (Ph. L.) Prepared (strained) Burgundy pitch, 2 lbs.; prepared frankincense (thus), 1 lb.; yellow resin and bees' wax, of each, 4 oz.; melt them together, then add, olive oil and water, of each, 2 fl. oz.; expressed oil of nutmeg (mace), 1 oz.; and, constantly stirring, evaporate to a proper consistence.

2. (Ph. E.) Burgundy pitch, 1 lb.; resin and bees' wax, of each, 2 oz.; olive oil and water, of each, 1 fl. oz.; oil of mace, ½ oz.; as the last.

3. (B. P.) Burgundy pitch, 26; common frankincense, 13; resin, 4½; yellow wax, 4½; expressed oil of nutmegs, 1; olive oil, 2; water, 2; add the oil and the water to the other ingredients, previously melted together; stir, and evaporate to a proper consistency.

Uses, &c. Burgundy-pitch plaster is stimulant, rubefacient, and counter-irritant. It is a common application to the chest in pulmonary affections, to the joints in rheumatism, and to the loins in lumbago. Spread on leather, it forms a good *warm plaster* to wear on the chest during the winter. "When it produces a serous exudation, it should be frequently renewed."

The BURGUNDY-PITCH PLASTER of the *shops* is commonly made as follows:—Factitious Burgundy pitch (bright coloured), 42 lbs.; palm oil (bright), ¾ lb.; bees' wax (bright), 5 lbs.; melt, and, when nearly cold, add, of oil of mace, 6 oz.; oil of nutmeg, 1 oz.

Calefa'cient Plaster. *Syn.* WARM PLASTER; EMPLASTRUM CALEFACIENS (Ph. D.), L. *Prep.* (Ph. D.) Plaster of cantharides, ½ lb. (1 part); Burgundy pitch, 5½ lb. (11 parts); melt them together by a gentle heat, and stir the mixture as it cools until it stiffens. Stimulant, rubefacient, and counter-irritant; in a variety of affections. In some persons, when long applied, it blisters or produces a running sore.

Can'cer Plaster. *Syn.* EMPLASTRUM ANTICANCROSUM, L. *Prep.* 1. Wax plaster, 1 oz.; extract of hemlock, 1 dr.; levigated arsenious acid, ½ dr.

2. (Richter.) Extract of hemlock, 1 oz.; extract of henbane, ½ oz.; powdered belladonna, 1 dr.; acetate of ammonia, q. s. to form a plaster. Both the above must be used with great caution. See CANCER, &c.

Plaster of Canthar'ides. *Syn.* BLISTERING PLASTER, VESICANT P., PLASTER OF SPANISH FLIES; EMPLASTRUM CANTHARIDIS (B. P., Ph. L. E. & D.), E. C. VESICATORIÆ, E. LYTTÆ, L. *Prep.* 1. (Ph. L.) Yellow wax and suet, of each, 7½ oz.; lard, 6 oz.; resin, 3 oz.; melt them together, remove the vessel from the fire, and, a little before they concrete, sprinkle in of cantharides (in very fine powder), 1 lb. (12 oz. B. P.), and mix.

2. (Ph. E.) Cantharides, bees' wax, resin, and suet, equal parts; as the last.

3. (Ph. D.) Spanish flies, 6 oz.; prepared lard, resin, and yellow wax, of each, 4 oz.; proceed as before, and "stir the mixture constantly until the plaster is cool."

4. (Wholesale.) From bees' wax and good lard, of each, 4 lbs.; flies and yellow resin, of each, 6 lbs.; suet, 10 lbs. A commonly used formula, the product of which is, however, greatly inferior to that of the Pharmacopœia.

Obs. All the above are used to raise blisters. The plaster is spread on white leather with a cold knife, and is surrounded with a margin of resin plaster to make it adhere. A piece of thin muslin or tissue paper is usually placed between the plaster and the skin to prevent absorption. A little powdered camphor is sometimes sprinkled on the surface of the spread plaster, to prevent strangury. A better mode of obviating the action on the urinary organs is by the copious use of diluents. This plaster should be rolled in starch powder, and not with oil.

Plaster of Cantharides (Compound). *Syn.* EMPLASTRUM CANTHARIDIS COMPOSITUM, L. *Prep.* (Ph. E.) Venice turpentine, 4½ oz.; cantharides and Burgundy pitch, of each, 3 oz.; bees' wax, 1 oz.; verdigris (in fine powder), ½ oz.; powdered mustard and black pepper, of each, 2 drs.; mix at a heat under 212° Fahr. Stronger than the last, and quicker in its action; but it causes more pain, and is much more apt to occasion troublesome ulcerations. Used in gout, spasms of the stomach, &c.

Plaster, Capuchin'. See PLASTER OF EUPHOBIUM.

Plaster of Car'bonate of Lead. *Syn.* EMPLASTRUM PLUMBI CARBONATIS, E. CERUSSÆ, L. *Prep.* (P. Cod.) Carbonate of lead, 1 lb.; olive oil and water, of each, 2 lbs.; boil them together until they combine and form a plaster; lastly, remelt this with white wax, 3½ oz. Its properties resemble those of ordinary lead plaster. An excellent emollient and defensive plaster. See MAHY'S PLASTER.

Plaster, Cephal'ic. *Syn.* LABDANUM PLASTER; EMPLASTRUM CEPHALICUM, E. LABDANI, L. *Prep.* (Ph. L. 1788.) Labdanum, 3 oz.; frankincense (thus), 1 oz.; melt, and add to the mixture, when nearly cold, powdered cinnamon and expressed oil of mace, of each, ½ oz.; oil of mint, 1 dr. Applied to the forehead or temples, in headache; to the stomach, in colds, &c. See BURGUNDY PITCH PLASTER, &c.

Plaster, Cheselden's Stick'ing. *Syn.* EMPLASTRUM PLUMBI CUM PICE, L. *Prep.* From lead plaster, 2 lbs.; Burgundy pitch (genuine), 1 oz.; melted together.

Plaster, Corn. *Syn.* EMPLASTRUM AD CLAVOS, L. *Prep.* 1. Resin plaster, 5 parts; melt, stir in of sal ammoniac (in fine powder), 1 part, and at once spread it on linen or soft leather.

2. (Kennedy's.) From bees' wax, 1 lb.; Venice turpentine, 5 oz.; verdigris (in fine powder), 1½ oz.; mixed by a gentle heat, and spread on cloth. It is cut into pieces, and

polished, and of these 1 dozen are put into each box.

3. (Le Foret.) Galbanum plaster, 2 oz.; melt by a very gentle heat; add, sal ammoniac and saffron, of each, ½ oz.; powdered camphor, 2 oz.; and, when nearly cold, stir in of liquor of ammonia, 2 oz. Applied, spread on leather, to the corn only, as it will blister the thinner skin surrounding its base.

4. (Ph. Sax.) Galbanum plaster, 1 oz.; pitch, ½ oz.; lead plaster, 2 drs.; melt them together, and add verdigris and sal ammoniac (in fine powder), of each, 1 dr. For other formulæ, see VERDIGRIS PLASTER (*below*), and CORNS.

Plaster, Court. *Syn.* STICKING PLASTER, ISINGLASS P.; EMPLASTRUM ICHTHYOCOLLÆ, E. ADHESIVUM ANGLICUM, L. *Prep.* 1. Isinglass, 1 part; water, 10 parts; dissolve, strain the solution, and gradually add to it of tincture of benzoin, 2 parts; apply this mixture, gently warmed, by means of a camel-hair brush, to the surface of silk or sarcenet, stretched on a frame, and allow each coating to dry before applying the next one, the application being repeated as often as necessary; lastly, give the prepared surface a coating of tincture of benzoin or tincture of balsam of Peru. Some manufacturers apply this to the unprepared side of the plaster, and others add to the tincture a few drops of essence of ambergris or essence of musk.

2. (Deschamps'.) A piece of fine muslin, linen, or silk, is fastened to a flat board, and a thin coating of smooth, strained flour paste is given to it; over this, when dry, two coats of colourless gelatine, made into size with water, q. s., are applied warm. Said to be superior to the ordinary court plaster.

3. (Liston's.) Soak isinglass, 1 oz., in water, 2½ fl. oz., until it becomes swollen and quite soft; then add of proof spirit, 3½ fl. oz., and expose the mixture to the heat of hot water, frequently stirring, until the union is complete; lastly, apply four coats of the solution to the surface of oiled silk nailed to a board, by means of a soft brush.

4. (Dr. Paris.) Black silk or sarcenet is strained and brushed over 10 or 12 times with the following composition:—Gum benzoin, ½ oz.; rectified spirit, 6 oz.; dissolve. In a separate vessel dissolve of isinglass, 1 oz., in as little water as possible; strain each solution, mix them, decant the clear portion, and apply it warm. When the last coating is quite dry, a finishing coat is given with a solution of Chio turpentine, 4 oz., in tincture of benzoin, 6 oz.

Obs. The common 'COURT PLASTER' of the shops is generally prepared without using spirit, and with merely sufficient tincture of benzoin, or other aromatic, to give it an agreeable odour. Formerly, black silk or sarcenet was exclusively employed as the basis of the plaster, but at the present time checkered silk is also much in favour. 'FLESH-COLOURED COURT PLASTER' is likewise fashionable. 'TRANSPARENT COURT PLASTER' is prepared on oiled silk. 'WATERPROOF COURT PLASTER' is simply the common plaster which has received a thin coating of pale drying oil on its exposed surface. The FINEST COURT PLASTER of the West-end houses is now prepared on gold-beaters' skin (or the prepared membrane of the cæcum of the ox), one side of which is coated with the isinglass solution, as above, and the other with pale drying oil or a solution of either gutta percha or caoutchouc in chloroform, or in bisulphuret of carbon.

Plaster of Cro'ton Oil. *Syn.* EMPLASTRUM CROTONIS, E. OLEI TIGLII, L. *Prep.* (Bouchardat.) To lead plaster, 4 parts, melted by a very gentle heat, add of croton oil, 1 part. A powerful counter-irritant; it also generally acts powerfully on the bowels.

Plaster of Cum'in. *Syn.* EMPLASTRUM CUMINI (Ph. L.), E. CYMINI, L. *Prep.* 1. (Ph. L.) Burgundy pitch, 3 lbs.; bees' wax, 3 oz.; melt, add of cumin seed, caraways, and bay-berries, of each (in powder), 3 oz.; next add of olive oil and water, of each, 1½ fl. oz., and evaporate to a proper consistence.

2. (Wholesale.) From yellow resin, 7 lbs.; bees' wax and linseed oil, of each, ½ lb.; powdered cumin and caraway seeds, of each, 7 oz.; mix.

Obs. This is a mere revival of the formula of the Ph. L. 1724. In that of the Ph. L. 1788 no water was ordered, and the powders simply stirred into the melted mass shortly before it cools; the common practice in all laboratories.

Cumin plaster is carminative, stimulant, and discutient. It is applied over the regions of the stomach and bowels in colic, dyspepsia, and flatulence, and is also applied to indolent tumours. It has long been a favourite remedy with the lower classes.

Delacroix's Agglu'tinative Plaster. *Syn.* EMPLASTRUM GLUTINANS SANCTI ANDREÆ À CRUCE, E. PICIS CUM ELEMI; L. EMPLÂTRE D'ANDRÉ DE LA CROIX, Fr. *Prep.* (P. Cod.) From Burgundy pitch, 25 parts; gum elemi, 6 parts; Venice turpentine and oil of bays, of each, 3 parts; melted together, and strained.

Plaster, Diach'ylon. See LEAD PLASTER.

Plaster, Diapal'ma. See PALM PLASTER.

Plaster of El'emi. *Syn.* EMPLASTRUM ELEMI, L. *Prep.* From wax plaster, 3 parts; gum elemi, 1 part; melted together by a gentle heat. Stimulant and discutient. *Used* for issues, &c.

Plaster of Euphor'bium. *Syn.* EMPLASTRUM EUPHORBII, L. *Prep.* 1. (Guy's Hosp.) Burgundy pitch plaster, 8 oz.; melt, and add of euphorbium (in powder), 1 dr.

2. (CAPUCHIN PLASTER—Ph. Wirt.) Burgundy pitch and bees' wax, of each, 3 oz.; Venice turpentine, 1 oz.; melt them together, add, gum ammoniacum, olibanum, mastic, and lapis calaminaris, of each, 1 oz.; euphorbium,

pyrethrum, and common salt, of each (in powder), 2 oz.; and stir until the mass concretes. Both of the above are stimulant, rubefacient, and counter-irritant.

Plaster, Fayard's. See PAPER (Gout).

Plaster of Flower of Ointments. *Syn.* EMPLASTRUM FLOS UNGUENTORUM DICTUM.—L. *Prep.* From frankincense (thus), yellow resin, suet, and bees' wax, of each 1 lb.; olibanum, ½ lb.; Venice turpentine, 5 oz.; gum myrrh, 2 oz.; white wine, 16 fl. oz.; boil to a plaster, adding, before the mass cools, of camphor, ¼ oz. Calefacient and stimulant. (See page 859.)

Plaster of Frank'incense. *Syn.* STRENGTHENING PLASTER; EMPLASTRUM THURIS, E. ROBORANS, L. *Prep.* (Ph. L. 1788.) To lead plaster, 2 lbs., melted by a gentle heat, add of frankincense (thus), ½ lb., dragon's blood (in powder), 3 oz., and stir well. In muscular relaxations, weak joints, &c. Mr. Redwood says that a "better-looking plaster is produced by melting the frankincense and dragon's blood together, and straining them through a cloth, then mixing these with the lead plaster previously melted." See PLASTER OF OXIDE OF IRON.

Plaster of Gal'banum. *Syn.* COMPOUND GALBANUM PLASTER, YELLOW DIACHYLON, GUM PLASTER, DIACHYLON WITH THE GUMS, EMPLASTRUM GALBANI (B. P., Ph. L.), E. GUMMOSUM (Ph. E.), L. *Prep.* 1. (Ph. L.) Take of strained galbanum, 8 oz.; common turpentine, 1 oz.; melt them together, then add of prepared frankincense (thus), 3 oz.; and next, of lead plaster, 3 lbs., previously melted over a slow fire.

2. (Ph. E.) Gum ammoniacum and galbanum, of each, ½ oz.; melt them together, strain, and add, of litharge plaster, 4 oz.; bees' wax, ¼ oz.; (both previously melted;) and mix the whole thoroughly. These proportions are the same as those of the B. P.

3. (Wholesale.) From lead plaster, 42 lbs.; yellow resin, 12 lbs.; strained galbanum, 3 lbs.; strained assafœtida, 1 oz.

Obs. Galbanum plaster is stimulant and resolvent, and is much used in indolent, scrofulous, and other tumours, painful gouty and rheumatic joints, in rickets, &c.

Plaster, Gaulthier's. *Prep.* (Guibourt.) Palm plaster, 12 parts; olive oil and white wax, of each, 1 part; melt, and add of Venice turpentine, 2 parts. More adhesive than the simple PALM PLASTER.

Plaster of Gin'ger. *Syn.* EMPLASTRUM ZINGIBERIS, L. See GINGER (page 567).

Plaster, Gout. *Syn.* EMPLASTRUM ANTARTHRITICUM, L. See PLASTERS OF GALBANUM, PITCH, &c., GOUT PAPER.

Plaster of Gum. See GALBANUM PLASTER.

Plaster of Hem'lock. *Syn.* EMPLASTRUM CONII, E. CICUTÆ, L. *Prep.* 1. Wax, 1 part; Burgundy pitch, 9 parts; melt them together, and add of extract of hemlock, 3 parts.

2. (Ph. Bat.) Lead plaster and bees' wax, of each, 1 lb.; olive oil, 6 fl. oz.; melt, and add of powdered hemlock (recent), 1 lb.

Obs. Hemlock plaster is occasionally used as an application to painful and malignant ulcers and tumours, painful joints, &c. A spread plaster of it, with 6 or 8 grs. of tartar emetic (in very fine powder) sprinkled over its surface, has been highly extolled as a counter-irritant in hooping-cough, phthisis, &c.

Plaster of Hen'bane. *Syn.* EMPLASTRUM HYOSCYAMI, L. *Prep.* As the last, but using henbane instead of hemlock. As an anodyne, in various external affections.

Plaster of I'odide of Potas'sium. *Syn.* EMPLASTRUM POTASSII IODIDI (Ph. L.), L. *Prep.* (Ph. L.) Iodide of potassium, 1 oz.; olive oil, 2 fl. drs.; triturate them together, then add, of strained frankincense (thus), 6 oz.; wax, 6 drs.; and stir constantly until the mass cools. "This plaster is to be spread on linen, rather than on leather." *Used* as a discutient or resolvent; more particularly as an application to scrofulous tumours and indurations.

Plaster of I'odine. *Syn.* EMPLASTRUM IODINII, L. *Prep.* Triturate iodine, 1 dr., in a warm mortar, with olive oil, 1 oz.; then add, of bees' wax, 1 oz., yellow resin, ½ oz., previously melted together, and stir the whole until it concretes. It should be, preferably, spread at once on leather, and applied shortly after being prepared. *Used* as the last.

Plaster of Iodine (Compound). *Syn.* EMPLASTRUM IODINII COMPOSITUM, L. *Prep.* 1. Iodine, 1 dr.; iodide of potassium, 2 drs.; rub them to a fine powder, add this to lead powder, 2 oz., Burgundy pitch, 1 oz., previously melted together, and just about to concrete. More active than either of the preceding.

2. (EMP. IOD. CUM BELLADONNÂ.) To belladonna plaster, 2 oz., melted by a very gentle heat, add iodine and iodide of potassium (in fine powder), of each, 1 dr., and stir the mixture until nearly cold. Powerfully resolvent and anodyne. *Used* in the same cases as the preceding, when there is much pain.

Plaster of I'ron. See PLASTER OF OXIDE OF IRON.

Plaster of I"singlass. See COURT PLASTER.

Plaster, Is'sue. *Syn.* EMPLASTRUM AD FONTICULOS, SPARADRAPUM PRO FONTICULIS, L. *Prep.* 1. From bees' wax, ½ lb.; Burgundy pitch and Chio turpentine, of each, 4 oz.; vermilion and orris powder, of each, 1 oz.; musk, 4 grs.; melted together, and spread upon linen. This is afterwards polished with a smooth piece of glass moistened with water, and cut into pieces.

2. (Ph. Aust.) Yellow wax, 6 oz.; mutton suet, 2 oz.; lard, 1½ oz.; melt, add of turpentine, 1½ oz., and afterwards, of red lead, 4 oz.; dip pieces of linen into the melted mixture, pass these between rollers, and, when cold, polish them, as before, and cut them into squares. The issue plaster (issue paper; charta

ad fonticulos) of the Ph. Suecica is a nearly similar compound, with the addition of about 1-48th part of verdigris, in very fine powder, and being spread upon paper.

Plaster, Kennedy's. See CORN PLASTERS.

Plaster, Kirkland's. See AMMONIACAL PLASTER.

Plaster of Lab'danum. See CEPHALIC PLASTER.

Plaster of Lead. *Syn.* LEAD PLASTER, LITHARGE P., COMMON P., DIACHYLON, SIMPLE DIACHYLON, WHITE D.; EMPLASTRUM PLUMBI (B. P., Ph. L.), E. LYTHARGYRI (Ph. E. & D.), E. COMMUNE, DIACHYLON SIMPLEX, L. *Prep.* 1. (Ph. L.) Oxide of lead (litharge), in very fine powder, 6 lbs.; olive oil, 1 gal.; water, 1 quart; boil them over a slow fire, constantly stirring, to the consistence of a plaster, adding a little boiling water, if nearly the whole of that used in the beginning should be consumed before the end of the process.

2. (Ph. E.) Litharge, 5 oz.; olive oil, 12 fl. oz.; water, 8 fl. oz.; as the last.

3. (Ph. D.) Litharge, 5 lbs.; olive oil, 1 gal.; water, 1 quart.

4. (Otto Kohnke.) For each lb. of litharge employed, add ¼ pint of colourless vinegar (each fl. oz. of which is capable of saturating ⅛ dr. of carbonate of potassa); add the oil, boil until all moisture is evaporated, and until only a few striæ of litharge rise to the surface, then remove the vessel from the heat, add gradually ⅓ to ½ as much vinegar as before, and boil the mixture to a proper consistence.

5. (Wholesale.) From Genoa oil, 7 galls. (or 65 lbs.); litharge (perfectly free from copper), 28 lbs.; water, 2½ galls.; boil to a plaster, as before.

6. (B. P.) Oxide of lead, in very fine powder, 1; olive oil, 2½; water, 1; boil all the ingredients together gently by the heat of a steam bath, and keep them simmering for 4 or 5 hours, stirring constantly until the product acquires the proper consistence for plaster, adding more water during the process, if necessary.

Obs. The London College orders too little oil. The second, fourth, and fifth formulæ produce beautiful plasters, that keep well; those of the others, although very white, get hard and brittle much more rapidly. The proper proportion of oil is fully 2⅓ times the weight of the litharge,—2½ times appears the best quantity; and without this is used, the plaster speedily gets hard and non-adhesive. The process consists in putting the water and the litharge into a perfectly clean and well-polished tinned copper or copper-pan, mixing them well together with a spatula, adding the oil, and boiling, with constant stirring, until the plaster is sufficiently hard, when thoroughly cold. This process usually occupies from 4 to 5 hours, but by adopting the fourth formula an excellent plaster may be made in from 20 to 30 minutes. This plaster is generally cooled by immersion in cold water; and to render it very white, a quality highly prized in the trade, it is usual to submit it to laborious 'pulling,' in the manner already noticed.

Use. As a simple defensive plaster or strapping; but principally as a basis for other plasters.

Plaster, Liston's. See COURT PLASTER.

Plaster, Mahy's. *Syn.* EMPLASTRUM PLUMBI CARBONATIS, E. P. C. COMPOSITUM, L. *Prep.* (Ph. U. S.) Carbonate of lead (pure white lead), 1 lb.; olive oil, 32 fl. oz.; water, q. s.; boil them together, constantly stirring until perfectly incorporated; then add, of yellow wax, 4 oz.; lead plaster, 1¼ lb.; and when these are melted, and the mass somewhat cooled, stir in of powdered orris root, 9 oz. A favourite application in the United States of America to inflamed and excoriated surfaces, bed-sores, burns, &c.

Plaster of Mel'ilot. *Syn.* EMPLASTRUM MELILOTI, E. È MELILOTO, L. *Prep.* 1. (Ph. E. 1744.) Fresh melitot, chopped small, 6 lbs.; suet, 3 lbs.; boil until crisp, strain with pressure, and add, of yellow resin, 8 lbs.; bees' wax, 4 lbs., and boil to a plaster. Stimulant. *Used* to dress blisters, &c. The greater portion of this plaster in the shops is made without the herb, and is coloured with verdigris. (See the next formula.)

2. (Wholesale.) Take of yellow resin, 18 lbs.; green ointment, 4½ lbs.; yellow wax, 3 lbs.; finely powdered verdigris, q. s. to give a deep-green colour.

Plaster, Mercu″rial. *Syn.* EMPLASTRUM MERCURIALE, E. HYDRARGYRI (B. P., Ph. L. E. & D.), L. *Prep.* 1. (Ph. L.) Add, gradually, of sulphur, 8 grs., to heated olive oil, 1 fl. dr., and stir the mixture constantly with a spatula until they unite; next add of mercury, 3 oz., and triturate until globules are no longer visible; lastly, gradually add of lead plaster (melted over a slow fire), 1 lb., and mix them all well together. (About 1 fl. dr. of balsam of sulphur may be substituted for the oil and sulphur ordered above.) These proportions are the same as those of the B. P.

2. (Ph. E.) Resin, 1 oz.; olive oil, 9 fl. drs.; mix by heat, cool, add of mercury, 3 oz., and triturate until its globules disappear; then add of litharge plaster, 6 oz. (previously liquefied), and mix the whole thoroughly.

3. (Ph. D.) Oil of turpentine, 1 fl. oz.; resin, 2 oz.; dissolve, with the aid of heat; add of mercury, 6 oz.; triturate until the globules disappear, and the mixture assumes a dark gray colour, then add of litharge plaster (previously melted), 12 oz., and stir the whole until it stiffens on cooling.

4. (Wholesale.) Take of mercury, 7 lbs.; prepared sevum, ¼ lb.; triturate until the globules disappear, and add the mixture to lead plaster (melted by a gentle heat), 36 lbs.; stir them well together, and until they concrete. Very fine bluish-slate or lead colour.

Obs. Mercurial plaster is used as a discutient in glandular enlargements, and other swellings; and is also applied over the hepatic regions in liver complaints.

Plaster, Mercurial, with Belladon'na. *Syn.* EMPLASTRUM HYDRARGYRI CUM BELLADONNÂ, L. *Prep.* From mercurial plaster, 6 drs.; extract of belladonna, 2 drs.; olive oil, 1 dr.; mixed by a gentle heat. One of our most useful anodyne and discutient applications, in painful scirrhous, scrofulous, and syphilitic tumours. The Medico-Chirurgical Pharm. orders ½ fl. dr. of hydrocyanic acid to be added to every 2 oz. of the above.

Plaster of Min'ium. *Syn.* EMPLASTRUM MINII, E. È MINIO, E. PLUMBI OXYDI RUBRI, L. *Prep.* (Ph. L. 1746.) Olive oil, 4 lbs.; minium (red lead), in fine powder, 2½ lbs.; water, q. s.; proceed as for lead plaster (which it closely resembles).

Obs. To ensure a good colour and the quality of keeping well, the quantity of oil should be increased about 1-3rd. When discoloured by heat it forms the 'brown minium plaster' (emp. è minio fuscum) of old pharmacy. Lead plaster, either alone or with the addition of a little red lead, is usually sold for it.

Plaster of Minium (Compound). *Syn.* NUREMBERG PLASTER; EMPLASTRUM MINII COMPOSITUM, L.; EMPLÂTRE DE NUREMBERG, Fr. *Prep.* (Soubeiran.) Red lead, 12 parts; olive oil, 8 parts; grind them together on a porphyry slab, and add the mixture to lead plaster, 50 parts, bees' wax, 24 parts, melted together; lastly, when nearly cold, stir in of camphor, 1 part.

Plaster, Morrison's Adhesive. *Syn.* MORRISON'S ADHESIVE PASTE. From wheaten flour, 2 oz.; mild ale, ¼ pint; stir them together, and heat the mixture to the boiling-point; when cold, add of powdered resin, 3 oz.; and, constantly stirring, again heat them to boiling. *Used* as a depilatory in ring-worm, &c.

Plaster of Mu'cilages. *Syn.* DIACHYLON COMPOSITUM, EMPLASTRUM È MUCILAGINIBUS, L. *Prep.* (Ph. L. 1746.) Bees' wax, 20 oz.; oil of mucilages, 4 oz.; melt, and add them to strained ammoniacum, 3 oz., common turpentine, 1 oz., previously melted together. Stimulant and emollient.

Plaster of Mus'tard. *Syn.* EMPLASTRUM SINAPIS, L. This is always an extemporaneous preparation. Flour of mustard is made into a stiff paste with lukewarm water, or with vinegar, and is then spread on a piece of calico or linen (folded two or three times); over the surface of the mustard is placed a piece of gauze or thin muslin, and the plaster is then applied to the part of the body it is intended to medicate. Its action is that of a powerful rubefacient and counter-irritant; but its application should not be continued long, unless in extreme cases. Its effects are often apparently wonderful. We have seen very severe cases of facial neuralgia, sore throat, painful joints, rheumatic pains, &c., relieved in a few minutes by means of a mustard plaster or '*poultice*.'

Plaster, Nuremberg. See COMPOUND MINIUM PLASTER.

Plaster of O'pium. *Syn.* EMPLASTRUM ANODYNUM, E. OPII (B. P., Ph. L. E. & D.), L. *Prep.* 1. (Ph. L.) Lead plaster, 8 oz.; melt, and add of frankincense (thus), 2 oz.; next, add of extract of opium, 1 oz., previously dissolved in boiling water, 1 fl. oz.; and, constantly stirring, evaporate the mixture over a slow fire to a proper consistence. This plaster is much stronger than that of the Ph. L. 1836 and of the other British Colleges.

2. (Ph. L. 1836.) Lead plaster, 1 lb.; melt, add of powdered thus, 3 oz.; mix, and further add, of powdered opium, ½ oz., water, 8 fl. oz., and boil to a proper consistence.

3. (Ph. E.) Litharge plaster, 12 oz.; Burgundy pitch, 3 oz.; liquefy by heat, then add, by degrees, of powdered opium, ½ oz., and mix them thoroughly. This and the preceding contains only 1-3rd part of the opium ordered in the present Ph. L. & D.

4. (Ph. D.) Resin plaster, 9 oz.; opium, in fine powder, 1 oz.; as the last. Same as B. P.

Obs. The above plaster is reputed anodyne, and useful in various local pains; but its virtues in this way have been greatly exaggerated. The formula of the Ph. L. 1836, from being less costly, is still often employed in place of that of the Ph. L. 1851. The following is commonly used:—Lead plaster, 14 lbs.; yellow resin, 2 lbs.; powdered opium, ½ lb.

Plaster of Ox'ide of I'ron. *Syn.* IRON PLASTER, FRANKINCENSE P., STRENGTHENING P.; EMPLASTRUM ROBORANS, E. FERRI (B. P., Ph. L. E. & D.), E. THURIS, E. FERRI OXYDI RUBRI, L. *Prep.* 1. (Ph. L.) Lead plaster, 8 oz.; frankincense (thus), 2 oz.; melt them together over a slow fire, sprinkle into the mixture sesquioxide of iron, 1 oz., and mix the whole well together.

2. (Ph. E.) Litharge plaster, 3 oz.; yellow resin, 6 drs.; bees' wax, 3 drs.; melt them together, then add of red oxide of iron, 1 oz., previously triturated with olive oil, 3½ fl. drs.

3. (Ph. D.) Litharge plaster, 8 oz.; Burgundy pitch, 2 oz.; peroxide of iron, in fine powder, 1 oz.; as No. 1. Same as B. P.

4. (Wholesale.) From lead plaster (quite dry), 84 lbs.; powdered yellow resin, 14 lbs.; 'crocus martis' (lively coloured), 14 lbs.; olive oil, 3 pints; as No. 2.

Obs. Iron plaster is reputed strengthening and stimulant. It is employed as a mechanical support in muscular relaxation, weakness of the joints, &c., especially by public dancers. Its tonic action is probably wholly imaginary. No. 4 is the 'EMPLASTRUM ROBORANS' of the shops at the present time.

Oxycro'ceum Plaster. *Syn.* EMPLASTRUM OXYCROCEUM, L. *Prep.* 1. (Ph. E. 1744.) Bees' wax, 1 lb.; black pitch and strained galbanum, of each ½ lb.; melt, and add of Venice turpentine, powdered myrrh, and olibanum, of each, 3 oz.; powdered saffron, 2 oz.

2. (Wholesale.) From black pitch, 9 lbs.;

black resin, 11 lbs.; bees' wax and lard, of each, 2½ lbs.; melted together. Warm; discutient. Still popular with the lower orders. The saffron of the original formula never finds its way into the oxycroceum plaster of the druggists.

Palm Plaster. *Syn.* EMPLASTRUM DIAPALMUM, L.; DIAPALME, EMPLÂTRE DIAPALME, Fr. *Prep.* (P. Cod.) Lead plaster, 32 parts; yellow wax, 2 parts; melt them together, add of sulphate of zinc, 1 part, dissolve in a little water, and continue the heat, with constant agitation, until all the water is evaporated.

Obs. This plaster originally contained palm oil, and this ingredient is still ordered in the formulæ of Plenck and Reuss. Soubeiran directs white wax to be employed.

Paracelsus's Plaster. *Syn.* EMPLASTRUM PARACELSI, E. STYPTICUM, L. *Prep.* From lead plaster, 28 lbs.; galbanum plaster, 2 lbs.; powdered white canella and gum thus, of each, 1½ lb.; melted together. The original formula, as well as that of the Ph. L. 1721, were similar, although much more complicated.

Plaster of Pitch. *Syn.* POOR MAN'S PLASTER, GOUT P., ANTI-RHEUMATIC P.; EMPLASTRUM PAUPERIS, E. ANTIRHEUMATICUM, E. ANTARTHRITICUM, E. PICIS COMMUNE, L. This has been already noticed under the head of RESIN PAPER. It is also, but less frequently, spread on cloth and leather. (See *page* 881.)

Prestat's Adhe'sive Plaster. *Prep.* From lead plaster, 2½ lbs.; yellow resin, 5 oz.; Venice turpentine, 4 oz.; gum ammoniacum and mastic, of each, 1¼ oz.; made into a plaster, and spread on linen or calico.

Plaster of Red Lead. See PLASTER OF MINIUM.

Plaster of Res'in. *Syn.* ADHESIVE PLASTER, RESINOUS P.; EMPLASTRUM ADHESIVUM, E. RESINÆ (B. P., Ph. L. & D.), E. RESINOSUM (Ph. E.), E. LYTHARGYRI CUM RESINÂ, L. *Prep.* 1. (Ph. L.) To lead plaster, 3 lbs., melted by a gentle heat, add of resin, ½ lb., also liquefied by heat, and mix. The formula of the Ph. U. S. is similar.

2. (Ph. E.) Litharge plaster, 5 oz.; resin, 1 oz.; mix with a moderate heat.

3. (Ph. D.) To litharge plaster, 2 lbs., melted by a gentle heat, add, of powdered resin, 4 oz., Castile soap, in powder, 2 oz., and mix them intimately.

4. (Wholesale.) Pale lead plaster (from a previous batch, and quite dry), 72 lbs.; olive oil (Genoa), 3 lbs.; melt them together in a bright and perfectly clean copper pan, and sift in of pale yellow resin (in powder), 12 lbs., stirring all the while. The mixture is to be cooled, and 'pulled' or 'worked,' after the manner of lead plaster.

5. (B. P.) Resin (in powder), 2; litharge plaster, 16; hard-soap, 1; melt the plaster with a gentle heat, add the resin and soap, first liquefied, and mix.

Obs. Resin plaster, spread upon calico, forms the well-known 'STRAPPING' or 'ADHESIVE PLASTER' so extensively used to protect raw surfaces, support parts, and for dressing ulcers, retaining the lips of recent cuts and wounds in contact, &c. It is gently stimulant, and is thought to assist the healing process. It is also employed as a basis for other plasters. The 'HOSPITAL PLASTER' of certain houses is of this kind. See COMPOUND SOAP PLASTER.

Resol'vent Plaster. *Syn.* EMPLASTRUM RESOLVENS, E. EX MIXTIS QUATUOR, L. *Prep.* (P. Cod.) Galbanum, hemlock, mercurial, and soap plasters, equal parts, melted together.

Roper's Royal Bath Plaster. *Prep.* (Cooley.) Strained black pitch, 16 oz.; Burgundy pitch, 10 oz.; tar and bees' wax, of each, 1 oz.; melt, and, when considerably cooled, add of expressed oil of mace, 2 drs., croton oil, 1 dr., and spread the mixture upon heart-shaped pieces of white sheep-skin, without remelting it. Stimulant and counter-irritant; recommended by its proprietor as a cure for all human ailments. The 'BATH-PLASTER PILLS,' also prepared by Mr. Roper, resemble several of the aperient pills already noticed. (See 'Anat. of Quackery.')

Scott's Plaster. *Prep.* From lead plaster, 14 oz.; olive oil and white resin, of each, 1 oz.; melted together, and spread on calico.

Sharp's Black Plaster. *Prep.* From olive oil, 5 parts; carbonate of lead, 4 parts; bees' wax, 1 part; boiled to a plaster.

Plaster, Simple. See WAX PLASTER.

Plaster of Soap. *Syn.* EMPLASTRUM È SAPONE, E. SAPONIS (Ph. L. E. & D.), L. *Prep.* 1. (Ph. L.) To lead plaster, 3 lbs., melted by a slow heat, add of Castile soap, sliced, ½ lb., resin, 1 oz., both (also) liquefied by heat, and, constantly stirring, evaporate to a proper consistence.

2. (Ph. E.) To litharge plaster, 4 oz., gum plaster, 2 oz., melted together, add of Castile soap, in shavings, 1 oz., and boil a little.

3. (Ph. D.) To litharge plaster, 2½ lbs., melted over a gentle fire, add of Castile soap, in powder, 4 oz., and heat them together (constantly stirring) until they combine.

4. (B. P.) Hard soap (in powder), 6; lead plaster, 36; resin (in powder), 1; to the lead plaster, previously melted, add the soap and the resin, first liquefied, then, constantly stirring, evaporate to a proper consistence.

Obs. Care must be taken to evaporate all the moisture from the above compounds, as, if any is left in the plaster, it turns out crumbly, and does not keep well. Much heat discolours it. (See *below.*)

Soap plaster is emollient and resolvent, and is used in abrasions and excoriations, and as a dressing to soft corns, lymphatic tumours, &c.

Plaster of Soap (Compound.) *Syn.* EMPLASTRUM SAPONIS COMPOSITUM, E. ADHÆRENS, L. *Prep.* (Ph. D. 1826.) Resin plaster, 3 oz.; soap plaster, 2 oz.; melted together.

Obs. Less emollient, but more stimulant, than the simple plaster. The 'EMPLASTRUM È MINIO CUM SAPONE'—Ph. E. 1744 was made by melting 1 part of soap with 5 parts of minium plaster. Neither of the above must be put into water. See RESIN PLASTER—Ph. D.

Plaster of Soap-ce'rate. *Syn.* EMPLASTRUM CERATI SAPONIS (B. P.). *Prep.* 1. From soap cerate, heated by means of a water bath until all the moisture is evaporated. Sometimes 2 or 3 drs. each of powdered mastic and gum ammoniacum are added for each pound of cerate. The product is generally spread whilst still warm. Said to be suppurative, resolvent, cooling, and desiccative. See CERATE (Soap).

2. (B. P.) Hard soap, 10; bees' wax, 12½; oxide of lead (in powder), 15; olive oil, 20; vinegar, 160; boil the vinegar with the oxide over a slow fire, or by a steam bath, constantly stirring them until they unite; then add the soap and boil again in a similar manner until all the moisture is evaporated; lastly, mix with the wax previously dissolved in the oil, and continue the process till the product takes the consistence of a plaster.

St. Andrew's Plaster. *Prep.* From yellow resin, 8 oz.; gum elemi, 2 oz.; Bordeaux turpentine and oil of the bay-laurel, of each, 1 oz.; melted together by a gentle heat. A stimulant, resolvent, and adhesive plaster, once supposed to possess extraordinary virtues.

Stick'ing Plaster. See COURT PLASTER, RESIN PLASTER, &c.

Plaster, Stom'ach. See AROMATIC PLASTER, &c.

Plaster, Strength'ening. See PLASTERS OF FRANKINCENSE and OXIDE OF IRON.

Plaster, Styp'tic. See OXIDE OF IRON PLASTER, PARACELSUS'S P., &c.

Plaster of Sul'phate of Quinine'. *Syn.* EMPLASTRUM QUINIÆ, E. Q. DISULPHATIS, L. *Prep.* 1. Sulphate of quinine, 1 dr.; resin plaster, 1 oz. Applied to the abdomen in intermittents.

2. Sulphate of quinine, 1 dr.; mercurial plaster, 2 oz. In affections of the liver or spleen, following intermittents, applied over the regions of those viscera.

3. Resin plaster, 9 drs.; sulphate of quinine, 1 dr.; camphor and oil of cajeput, of each, ½ dr. Applied over the epigastrium as a prophylactic of cholera.

Plaster of Thus. See PLASTER OF FRANKINCENSE.

Plaster of Ver'digris. *Syn.* EMPLASTRUM ÆRUGINIS, E. CUPRI SUBACETATIS, L. *Prep.* (P. Cod.) Bees' wax, 4 parts; Burgundy pitch, 2 parts; melt, add of Venice turpentine and prepared verdigris (in powder), of each, 1 part, and stir until the mass is nearly cold. For other formulæ, see CORN PLASTER, &c.

Plaster, Ver'mifuge. *Syn.* EMPLASTRUM VERMIFUGUM, E. ANTHELMINTICUM, L. *Prep.* From powdered aloes, 1 dr.; oil of chamomile, 10 drops; croton oil, 2 drops; oil of turpentine, *q. s.*

Vigo's Plaster. *Syn.* EMPLASTRUM VIGONIS, L. *Prep.* (P. Cod.) Lead plaster, 40 oz.; mercury, 12 oz.; liquid styrax, 6 oz.; bees' wax, turpentine, and resin, of each, 2 oz.; ammoniacum, bdellium, myrrh, and olibanum, of each, 5 drs.; saffron, 3 drs.; oil of lavender, 2 drs.; made into a plaster *s. a.*

Plaster, Warm. See CALEFACIENT PLASTER, BURGUNDY PITCH P., &c.

Plaster of Wax. *Syn.* SIMPLE PLASTER; EMPLASTRUM ATTRAHENS, E. SIMPLEX (Ph. E.), E. CERÆ, L. *Prep.* 1. (Ph. E.) Bees' wax, 3 oz.; suet and yellow resin, of each, 2 oz.; melt them together, and stir the mixture briskly until it concretes by cooling.

2. (Ph. L. 1836.) Yellow wax and suet, of each, 3 lbs.; yellow resin, 1 lb.; as the last. Intended to be employed as a simple dressing, especially to blistered surfaces. It is now seldom used.

Plaster, White Diach'ylon. See LEAD PLASTER.

Plaster, Yellow Diach'ylon. See GALBANUM PLASTER.

Plaster, Zinco-lead. *Syn.* EMPLASTRUM ZINCO-PLUMBICUM, E. DIAPOMPHOLYGOS, L. *Prep.* (Ph. Succ.) Bees' wax, 1 lb.; olive oil and graphite (black lead), of each, 6 oz.; carbonate of lead, 4 oz.; oxide of zinc (impure), 3 oz.; olibanum, 1½ oz.; boil to a plaster. Astringent and desicant. Other forms substitute an equal weight of litharge for the graphite.

PLATE. The name commonly given to gold and silver wrought into instruments or utensils for domestic use.

The cleaning of plate is an important operation in a large establishment, as its durability, and much of its beauty, depend on this being properly done. The common practice of using mercurial plate-powder is destructive to both of these, as mercury not only rapidly erodes the surface of silver, but renders it softer, and, in extreme cases, even brittle. The only powder that may be safely used for silver is prepared chalk, of the best quality. For gold, the form of red oxide of iron, known as jeweller's rouge, is the most useful and appropriate. Chamois leather, a plate-brush, or very soft woollen rags, should alone be used to apply them; and their application should be gentle and long continued, rather than the reverse. Dirty plate, after being cleaned with boiling water, may be restored by boiling it in water, each quart of which contains a few grains of carbonate of soda, and about an ounce of prepared chalk, calcined hartshorn, or cuttle-fish bone, in very fine powder. The ebullition sets up a gentle friction, which effects its purpose admirably. The boiled plate, after being dried, is best 'finished off' with a piece of soft leather or woollen cloth which has been dipped into the cold mixture of chalk and water, and then dried. The same method answers admirably with German silver, brass, pewter, and all the softer metals. See POWDER (Plate), &c.

PLAT'INA. See PLATINUM.

PLA''TING. The art of covering copper and other metals with either silver or gold.

Plating is performed in various ways. Sometimes the silver is fluxed on to the surface of the copper by means of a solution of borax, and subsequent exposure in the 'plating furnace,' and the compound ingot is then rolled to the requisite thinness between cylinders of polished steel. The common thickness of the silver plate before rolling is equal to about the 1-40th of that of the compound ingot. Sometimes the nobler metal is precipitated from its solutions upon the copper by the action of chemical affinity, or, more frequently, by the agency of electro-chemical decomposition (electro-plating).

The metal employed for plating is a mixture of copper and brass, annealed or hardened, as the case may require. For electro-plated goods, 'nickel silver' is now almost invariably employed. See ELECTROTYPE (page 429), GILDING, PLATINISING, SILVERING, &c.

PLAT'INISING. Metals may be coated with platinum by nearly similar processes to those already referred to under PLATING. In the 'moist way,' vessels of brass, copper, and silver, are conveniently platinised in the following manner:—Solid bichloride of platinum, 1 part, is dissolved in water, 100 parts, and to this solution is added of common salt, 8 parts; or, still better, 1 part of ammonio-chloride of platinum and 8 parts of chloride of ammonium are placed in a suitable porcelain vessel, with about 40 parts of water, and the whole heated to ebullition; the vessels or utensils, previously made perfectly bright, are then immersed in the boiling liquid. In a few seconds they generally acquire a brilliant and firmly adhering layer of platinum.

Silver plates for voltaic batteries are commonly platinised by immersing them for a few seconds in a mixture of saturated solution of bichloride of platinum, 1 part; dilute sulphuric acid, 3 parts; water, 4 to 6 parts. Platinum battery plates are covered with a pulverulent deposit of platinum by means of the electrotype.

Platinised asbestos is prepared by dipping asbestos into a solution of bichloride of platinum, or one of the double chlorides of that metal, and then gradually heating it to redness. It is used as a substitute for spongy platinum. See ELECTROTYPE, VOLTAIC ELECTRICITY.

PLAT'INUM. Pt. *Syn.* PLATINA, WHITE GOLD; PLATINUM, L. A heavy, grayish-white metal, occurring chiefly in certain of the alluvial districts of Mexico and Brazil, in the Ural Mountains of Russia, in Ceylon, and in a few other places. It occurs in nature under the form of grains and small rolled masses, associated with palladium, rhodium, osmium, ruthenium, iridium, and a little iron. It has only been known in Europe since 1748.

Prep. The native alloy of this metal (crude platinum) is acted upon, as far as possible, by nitro-hydrochloric acid, containing an excess of hydrochloric acid, and slightly diluted with water, in order to dissolve as small a quantity of iridium as possible; to the deep yellowish-red and high acid solution thus produced ammonium chloride is added, by which nearly the whole of the platinum is thrown down in the state of ammonio-chloride. This substance, after being washed with a little cold water, is dried and heated to redness; the product is spongy metallic platinum. This is made into a thin uniform paste with water, introduced into a slightly conical mould of brass, and subjected to a graduated pressure, by which the water is squeezed out, and the mass rendered at length sufficiently solid to bear handling. It is next dried, very carefully heated to whiteness, and hammered, or subjected to powerful pressure by suitable means, whilst in the heated stated. It will now bear forging into a bar, and may afterwards be rolled into plates, or drawn into wire, at pleasure.

Prop,. &c. Platinum is one of the heaviest substances known, its sp. gr. being 21·5. It is whiter than iron, harder than silver, infusible in the strongest heat of our furnaces, and melts only when exposed to the highest temperature obtained by Deville's oxyhydrogen gas furnace. It is unaffected by air, water, and all the ordinary acids, and even its polish is uninjured by the strongest heat of a smith's forge; aqua regia, however, dissolves it, though with much more difficulty than gold; it is also superficially oxidised by fused hydrate of potassa. Spongy platinum, powdered platinum, and even perfectly clean platinum foil, possess the remarkable property of causing the union of oxygen and hydrogen gases, with more or less elevation of temperature. Platinum is precipitated from its solutions by deoxidising substances under the form of a black powder (platinum black), which has the power of absorbing oxygen, and again imparting it to combustible substances, and thus causing their oxidation. In this way alcohol and pyroxylic spirit may be converted into the acetic and formic acids, &c.

Platinum Black is simply platinum in a fine state of fluvium, and is readily obtained as follows:—1. A solution of platinic chloride, to which an excess of carbonate of sodium and a quantity of sugar have been added, is boiled until the precipitate which forms after a little time becomes perfectly black, and the supernatant liquid colourless; the black powder is then collected on a filter, washed, and dried by gentle heat.

2. Platinic-ammonium chloride, reduced to very fine powder, is moistened with strong sulphuric acid, and a small piece of zinc is thrust into the mixture; after the whole is reduced to a black powder, it is washed, first with hydrochloric acid, and then with pure water, and is, lastly, dried.

Platinum, in the state of platinum black, possesses the property of condensing gases, more especially oxygen, into its pores, and afterwards giving it out to various oxidisable substances. When placed in contact with a solution of formic acid, it converts it, with copious effervescence, into carbonic acid; alcohol, dropped upon it, becomes changed by oxidation into acetic acid, the rise of temperature being often sufficient to cause inflammation; exposed to a red heat, it shrinks in volume, assumes the appearance of common spongy platinum, and, for the most part, loses these peculiarities. That prepared with zinc explodes, when heated, like gunpowder. The spongy platinium is obtained by igniting the ammonium platinic chloride at a red heat.

The salts of platinum are recognised as follows:—Sulphuretted hydrogen throws down from neutral and acid solutions of the platinic salts a blackish-brown precipitate, which is only formed after a time in the cold, but immediately on heating the liquid. Ammonium sulphide also gives a blackish-brown precipitate, which completely redissolves in a large excess of the precipitant, provided the latter contains an excess of sulphur.

Chloride of ammonium and chloride of potassium give yellow crystalline precipitates, insoluble in acids, but soluble in excess of the precipitate, upon the application of heat, and decomposable by heat, with production of spongy platinum. Ammonia and potassium hydrate also give similar precipitates in solutions previously acidulated with hydrochloric acid.

Estim. This may be effected by throwing down the metal under the form of chloride of ammonium and platinum, which, after being washed on a filter with a little weak spirit to which a little of the precipitate has been added, and afterwards with the spirit alone, may be carefully dried at 212° Fahr., and weighed. Or, the precipitate may be ignited in a platinum crucible, and weighed under the form of a spongy platinum. 193·25 grs. of the platinic and ammonium chlorides are equivalent to 98·75 grs. of metallic platinum.

Uses. Platinum is valuable for the formation of crucibles, capsules, and other utensils or instruments intended to be exposed to a strong heat, or to the action of acids. Platinic chloride and the platinic and sodium chloride are much used in chemical analysis. Both of these are also used in medicines with the same intentions, and in the same doses, as the corresponding salts of gold. These compounds are poisonous. The antidotes and treatment are similar to those described under GOLD.

Concluding remarks.—Daville and Debray have recently introduced a method of refining platinum, which has already done much to extend the useful applications of the metal. The process consists in submitting the crude metal to the action of an intensely high temperature, obtained by the combustion of hydrogen (or coal-gas) with oxygen, in a crucible of lime. By this means large quantities of platinum (50 lbs. or more) can be kept fused until the sulphur, phosphorus, arsenic, and osmium, generally occurring in crude platinum, are oxidised and volatilised, and the iron and copper are oxidised and absorbed by the lime forming the crucible. At the International Exhibition of 1862 an ingot of pure platinum, weighing over 2 cwt., was exhibited by Messrs. Johnson & Mathey, as an illustration of the practical results of this process.

Platinic Chloride. $PtCl_4$. *Syn.* BICHLORIDE OF PLATINUM, CHLORIDE OF PLATINUM, PERCHLORIDE OF P.; PLATINI BICHLORIDUM (Ph. L.), L. *Prep.* By dissolving platinum in nitro-hydrochloric acid, and evaporating the solution to dryness at a gentle heat. *Prop., &c.* Reddish-brown, deliquescent, and very soluble in both water and alcohol, yielding orange-coloured solutions. It combines with a variety of metallic chlorides to form 'double salts.' *Used* as a test in chemical analysis, and as an alterative in secondary syphilis, &c. —*Dose.* $\frac{1}{16}$ to $\frac{1}{4}$ gr., dissolved in distilled water, or made into a pill with syrup and liquorice powder. Some persons prescribe much larger doses, but unsafely. Hoefer recommends an ointment made with it as an application to indolent ulcers. In doses of 5 grs. and upwards, it acts as a violent caustic poison. This last salt is the 'chloride of platinum' of the shops, and the one used in the arts and medicine. It forms one of the tests included in the 'Appendix' to the Ph. L.

Platinic-Ammonium Chloride. $Pt(NH_4)_2Cl_6$, or $PtCl_4 2NH_4Cl$. *Syn.* AMMONIO CHLORIDE OF PLATINUM, PLATINO-CHLORIDE OF AMMONIUM. *Prep.* A solution of chloride of ammonium is added to a strong solution of platinic chloride, and the precipitate washed with dilute alcohol.

Prop. Minute, transparent, yellow octahedral crystals; very feebly soluble in water, less so in dilute alcohol, and insoluble in acids; heat converts it into spongy platinum.

Platinic-Potassium Chloride. PtK_2Cl_6, or $PtCl_4 2KCl$. *Syn.* PLATINO-CHLORIDE OF POTASSIUM, POTASSIO-CHLORIDE OF PLATINUM. *Prep.* A bright yellow, crystalline precipitate, formed whenever solutions of the chlorides of platinum and of potassium are mixed; or a salt of potassium, acidulated with a little hydrochloric acid, is added to platinic chloride. In appearance, solubility, &c., it closely resembles ammonio-chloride of platinum.

Platinic - Sodium Chloride. $PtNa_2Cl_6$, or $PtCl_4 2NaCl$. *Syn.* CHLORIDE OF PLATINUM AND SODIUM, SODIO-CHLORIDE OF PLATINUM, PLATINO-BICHLORIDE OF SODIUM; PLATINI ET SODII CHLORIDUM, PLATINI SODIO-CHLORIDIUM, &c., L. *Prep.* (Redwood.) Platinic chloride, 17 parts; chloride of sodium, 6 parts; dissolve the two salts separately in water, q. s., mix the solutions, and evaporate, that crystals may form. The crystals are large, transparent, and of a yellow-red colour.—*Dose.* $\frac{1}{12}$ to $\frac{1}{4}$ gr.; in the same cases as the bichloride.

Platinous Oxide. PtO. *Syn.* OXIDE OF PLATINUM. *Prep.* By heating to below redness the platinic chloride and digesting with hydrate of potassium the residue.

Prop., &c. A black powder, soluble in excess of alkali, and freely so in the acids, forming brown solutions of the platinous salts. These are distinguished from solutions of the platinic salts by not being precipitated by chloride of ammonium. Platinous oxalate, in fine copper-coloured needles, may be obtained by heating platinic oxide in a solution of oxalic acid.

Platinic Oxide. PtO_2. *Syn.* BINOXIDE OF PLATINUM. *Prep.* 1. By exactly decomposing the platinic sulphate with nitrate of barium, and adding pure hydrate of sodium to the filtered solution, so as to precipitate only half the oxide. (Berzelius.)—2. By boiling platinic chloride with hydrate of sodium, in considerable excess, and then adding acetic acid.

Prop., &c. As the hydrate ($Pt(HO)_4$), it is a bulky brownish powder; this, when gently heated, becomes black and anhydrous. It forms salts with the acids, and combines with some of the bases. The salts have a red or yellow colour, and a remarkable tendency to form double salts with the alkaline salts.

Obs. Both the oxides of platinum are reduced to the metallic state on ignition.

Platinum, Spongy. *Prep.* 1. By heating ammonio-chloride of platinum to redness.

2. Crude bichloride of platinum and chloride of ammonium are separately dissolved in proof spirit, and the one solution added to the other as long as a precipitate forms; this is collected, and, whilst still moist, formed into little balls or pieces, which are then dried, and gradually heated to redness.

Prop., &c. These have been noticed above. Small balls of spongy platinum are used for the hydrogen instantaneous-light lamp (Dobereiner's lamp); but they are apt to absorb moisture from the atmosphere, and then lose their power of inflaming hydrogen, until they are re-dried and heated.

PLUG'GING. The introduction of a mass of lint, sponge, or other suitable material, into a wound or cavity, with the intention of arresting hæmorrhage. It is now seldom adopted, except in cases of bleeding from the nose, and that only after more approved methods have failed.

PLUM. A name applied to several varieties of the *Prunus domesticus* (Linn.), or wild plum. Among the cultivated varieties, the damson, greengage, French plum, magnum bonum or Mogul p., mirabelle p., Orleans p., and prune, are those best known. Grocers' 'plums' are raisins, or dried grapes.

PLUMBA'GO. *Syn.* GRAPHITE, BLACK-LEAD. One of the native forms of carbon. It contains from 95 to 100% of pure carbon; has a metallic lustre, and conducts electricity nearly as well as the metals. It was formerly regarded as a carbide of iron, but the iron generally found is now known to be merely in a state of mixture. There are two distinct varieties of graphite—crystallised or foliated graphite, obtained chiefly from Ceylon; and amorphous graphite (the ordinary plumago or black-lead), largely imported to this country from Germany. The Borrowdale mine in Cumberland, from which the finest black-lead was formerly derived, is now nearly exhausted. The foliated graphite of Ceylon and other parts is the principal material employed for making plumbago crucibles and other fire-resisting goods. The amorphons graphite is used for making black-lead pencils, polishing powder for stoves and grates ('lustre,' 'servant's friend,' &c.), and to diminish friction in heavy machinery (anti-friction powder). Its powder is also used to give conducting surfaces to articles on which it is desired to deposit copper by the electrotype. In medicine, plumbago has been used with apparent advantage, in herpes and several chronic skin diseases—externally, as an ointment made with four times its weight of lard; and internally, made into pills.

Purification. For medical and chemical use, graphite may be treated as follows:—

1. (Dumas and Stas.) Heat it to redness with caustic potassa, in a covered crucible, then wash it well with water, boil it in nitric acid, and in aqua regia, again wash it with water, dry it, and expose it at a white heat to a stream of dry chlorine gas; lastly, wash it with water, and again heat it to dull redness. In analysis.

2. (Ph. Bor.) Pure native plumbago, 1 lb., is boiled in water for 1 hour, then drained, and digested, for 24 hours, in a mixture of water, 8 oz.; nitric acid and hydrochloric acid, of each, 2 oz.; it is, lastly, well washed with water, and dried.

3. (Brodie's patent.) This process is only applicable to the hard varieties of graphite, as that of Ceylon. It consists in introducing coarsely powdered graphite, previously mixed with $\frac{1}{14}$th of its weight of chlorate of potassa, into 2 parts of concentrated sulphuric acid, which is heated in a water bath until the evolution of acid fumes ceases. The acid is then removed by water, and the graphite dried. Thus prepared, this substance, when heated to a temperature approaching a red heat, swells up to a voluminous mass of finely divided graphite. This powder, which is quite free from grit, may be afterwards consolidated by pressure, and used for making pencils or other purposes.

PLUM'BIC ACID. Binoxide of lead occasionally receives this name on account of its combining with some of the bases to form compounds which have been called plumbates.

PLUM'BUM COR'NEUM. See Chloride of Lead.

PLUM'OSE AL'UM. The old name of the silky amianthine crystals of the double sulphate of aluminum and iron occasionally found on alum slate. Asbestos has also been so called.

PLUNKET'S CANCER REMEDY. See Plunket's Caustic.

POACH'ING. Amongst cooks, a peculiar method of cooking small articles by a slight boiling or stewing process.

Poached eggs are prepared by breaking them into a small saucepan or stewpan containing about ½ a pint of boiling water, to which a teaspoonful of common salt, and, occasionally, a little vinegar, is added, and gently simmering them for 3 or 4 minutes, or until sufficiently firm to bear removal with a spoon or 'slice.' Another method is to employ melted butter, instead of water, and to dress them either with or without stirring.

Poached eggs are commonly served on toast, or with fried ham or bacon, with spice or vegetable seasoning at will. They form an excellent breakfast, or 'make-shift dinner.'

PODOPH'YLLIN. *Syn.* Resin of podophyllum; Resina podophylli (B. P.). Obtained from the root of the *Podophyllum peltatum* (Linn.), or may-apple, a substance officinal in the Ph. U. S.

Prep. 1. The alcoholic extract of may-apple is digested in cold ether, to remove fatty matter, and is then dissolved in rectified spirit; the solution is decoloured with a little animal charcoal, and filtered; it is, lastly, allowed to evaporate spontaneously.

2. (B. P.) Podophyllum, in coarse powder, 1; rectified spirit, 3¾, or a sufficiency; distilled water and hydrochloric acid, of each a sufficiency; exhaust the podophyllum by percolation with the spirit; distil over the spirit; slowly pour the liquid remaining after the distillation of the tincture into three times its volume of water acidulated with $\frac{1}{24}$th part of its weight of hydrochloric acid, constantly stirring; let it stand 24 hours; collect the resin which falls, wash on a filter with distilled water, and dry in a stove. Cholagogue purgative; used as a substitute for calomel.—*Dose.* ¼ to ½ gr., or even 2 grs. It is best to begin with ¼ gr. (Squire.)

Prop., &c. An amorphous, grayish-white mass, soluble in alcohol, and slightly soluble in water. It is a safe and certain cathartic, superior in activity to resin of jalap.—*Dose.* ½ to 3 grs. See Extract of May-apple.

PODOPHYLLUM ROOT. *Syn.* Podophylli radix (B. P.). The dried rhizome of the *Podophyllum peltatum*; imported from North America. Active and certain cathartic.—*Dose.* 10 to 20 grs.

POIS'ON. *Syn.* Toxicum, Venenum, L. Any substance which, when swallowed, or applied in any particular way to the living body, disturbs, suspends, or destroys one or more of the vital functions. In sufficient quantity, or in small doses long continued, the common result of the administration of deleterious substances is either impaired vitality or death.

Poisons are classified by Orfila under four heads:—

1. Irritant poisons, or such as inflame or corrode the parts with which they come in contact. Their chief effects are upon the alimentary canal, with, sometimes, ulceration of the tongue, fauces, and œsophagus. Nausea, vomiting, stomachic and intestinal pains, extreme anxiety and anguish, quick and feeble pulse, cold and clammy skin, and mucous, bilious, or bloody diarrhœa, are among the common leading symptoms. Arsenic, blue vitriol, verdigris, strong acids and alkalies, drastic purgatives, and numerous other substances, belong to this class.

2. Narcotic or Stupefying poisons, or such as paralyse the functions of the nervous system, and produce headache, vertigo, confused vision, delirium, stupor, convulsions, coma, &c. It includes morphia, opium, henbane, oil of bitter almonds, prussic acid, &c.

3. Narcotico-acrid poisons, which produce at the same time narcotism and irritation of the parts which they touch. Alcohol, belladonna, cocculus Indicus, colchicum, foxglove, hemlock, poisonous fungi, strychnine, tobacco, veratrine, &c., are of this kind.

4. Septic or Putrefiant poisons, including all those which alter, liquefy, or cause the putrescence of the fluids of the body; as sulphuretted hydrogen, the gas from sewers and cesspools, putrefying organic matter, miasmata, &c.

The treatment of cases of poisoning varies with the substance occasioning it; and, with the proper antidotes, will be found noticed under the names of the various substances that exert a deleterious action on the animal body. It may here, however, be useful to remark, that in almost all cases of poisoning copious vomiting should be excited as soon as possible by the administration of a powerful emetic; its action being promoted by copious draughts of lukewarm water, tickling the throat with the finger, &c. Should this fail, but not otherwise, the stomach-pump should be had recourse to. The vomiting should be kept up and the stomach well washed out with bland albuminous or mucilaginous liquids, such as milk-and-water, barley water, sweetened water, flour-and-water, or any similar matters, as circumstances may afford. After the vomiting a brisk aperient draught, or clyster, may be administered, and nervous irritability or exhaustion allayed by means of ether, opium, wine, or warm spirit-and-water, as the case may require. Even in a suspected case of poisoning, when proper medical advice is not at hand, an emetic should be immediately taken or administered. Vomiting may be, in general, produced very promptly by merely swallowing a cupful of warm water mixed with a teaspoonful of flour of mustard. If no dry mustard is at hand, a portion of the contents of a mustard-pot, put into the water, will answer nearly as well. As mustard may thus prove of so much use, it should never be wanting in any house; but even should there be no mustard at hand, warm water by itself, freely taken, forms a tolerably efficacious emetic.

POLARIZA'TION (of Light). A change produced upon light by the action of certain media and surfaces, by which it ceases to present the ordinary phenomena of reflection and transmission. Instruments or apparatus employed to effect this change are called 'polariscopes.' Although the polarization of light is frequently employed as a means of chemical investigation, and is of the utmost interest to the philosophical inquirer, its consideration scarcely comes within the province of this work. See 'Watt's Dict. of Chemistry,' 'Ganot's Physics,' &c.

POL'ISH. Various substances, differing widely from each other, are popularly known under this name. See POWDERS, VARNISH, &c., and *below*.

Polish, French. See page 541.

Polish, French Reviver. *Prep.* 1. Linseed oil, ½ pint; pale lac varnish and wood naphtha, of each, ¼ pint; well shaken together, and again every time before use.

2. Methylated rectified spirit, 3 pints; linseed oil and French polish, of each, 1 pint; as the last.

3. Linseed oil (pale), 1 quart; strong distilled vinegar, ½ pint; spirit of turpentine, ¼ pint; muriatic acid, 1 oz.

Furniture Cream. *Prep.* 1. Pearlash, 2 oz.; soft soap, 4 oz.; bees' wax, 1 lb.; water, 1 gall.; boil until the whole is united and forms a creamy liquid, when cold.

2. Bees' wax, ½ lb.; good yellow soap, ¼ lb.; water, 5 pints; boil to a proper consistence with constant agitation, then add of boiled oil and spirit of turpentine, of each, ½ pint. For use, the above are diluted with water, spread upon the surface with a painter's brush, and then polished off with a hard brush, cloth, or leather.

3. Boiled oil (pale), ½ pint; bees' wax, 1½ oz.; mixed by heat. Applied by a 'rubber,' and at once polished off.

Furniture Oil. See OILS.

Furniture, Paste. *Prep.* 1. Oil of turpentine, 1 pint; alkaline root, ¼ oz.; digest until sufficiently coloured, then add of bees' wax (scraped small), 4 oz.; put the vessel into hot water, and stir until the mixture is complete, then put it into pots. If wanted pale, the alkanet root should be omitted.

2. (White.) White wax, 1 lb.; solution of potassa, ½ gallon; boil to a proper consistence.

Polish, Harness. See page 229.

Polish, Leather. See BLACKING.

POL'LARD. See FLOUR.

POL'YCHREST. *Syn.* POLYCHRESTUS, L. A term formerly applied to several medicines on account of the numerous virtues they were supposed to possess. Sal polycrestus is the old name for sulphate of potassa.

POL'YCHROITE. The name formerly given to the colouring matter of saffron, from the variety of colours which it exhibits with different reagents. Its alcoholic and aqueous solutions are of a golden yellow; nitric acid turns it green; sulphuric acid, first blue, and then lilac.

POM'ACE. See CIDER.

POMA'TUM. *Syn.* POMMADE, Fr. This term was originally applied to a fragrant ointment prepared with lard and apples; but is now wholly restricted, in this country, to solid greasy substances used in dressing the hair. The pomatums of French pharmacy (POMMADES, GRAISSES MÉDICAMENTEUSES—P. Cod.; LIPAROLÉS—Guibourt; LIPAROLÉS and LIPAROIDÉS—Béral; STEAROLÉS—Chéreau) are soft ointments, having a basis of lard or fat, without resinous matter. See OINTMENT and POMMADE.

POMEGRAN'ATE. The *Punica Granatum* (Linn.), a small tree indigenous in Persia and the East. Fruit (POMEGRANATE; GRANATA, MALA PUNICA) is cooling and astringent; fruit-rind (POMEGRANATE PEEL; MALACORIUM, CORTEX GRANATI; GRANATUM—(Ph. L.) and root-bark (GRANATI RADIX—B. P., Ph. L. E. & D.) are powerfully astringent, detersive, and anthelmintic; the last more particularly so. The double flowers of the wild tree (BALAUSTINES; BALAUSTIÆ), as well as those of the cultivated one (CYTINI), are tonic and astringent.—*Dose.* 15 to 20 grs. of the root-bark, repeated every 30 or 40 minutes, until four doses have been taken, followed by castor oil; in tape-worm. As an astringent, all the parts described are commonly given under the form of decoction.

POMMADE. [Fr.] The term applied by Continental perfumers to any soft fragrant ointment (POMATUM).

In the preparation of pommades, one of the first objects of consideration is to obtain their fatty basis in as fresh and pure a state as possible. Lard, beef and mutton suet, beef marrow, veal fat, and bear's fat, are the substances commonly employed for this purpose, either singly or in mixtures of two or more of them. The fat, carefully selected from a young and healthy animal, after being separated from extraneous skin and fibre, is pounded in a marble mortar, in the cold, until all the membranes are completely torn asunder. It is next placed in a covered porcelain or polished metal pan, and submitted to the heat of a water bath, which is continued until its fatty portion has liquefied, and the albuminous and aqueous matter, and other foreign substances, have completely separated and subsided. The liquid fat is then carefully skimmed, and at once passed through a clean flannel filter. In this state it may be aromatised or perfumed at will; after which, when it is intended that the pommade should be opaque and white, it is assiduously stirred or beaten with a glass or wooden knife, or spatula, until it concretes; but when it is desired that it should appear transparent or crystalline, it is allowed to cool very slowly, and without being disturbed. To prevent the accession of rancidity, a little benzoic acid, gum benzoin, or nitric ether, may be added to the fat, whilst in the liquid state, as noticed under FAT and OINTMENT. Sometimes a small portion of white wax or bees' wax (according to the intended colour of the product) is melted with the fat, to increase its solidity. Some parties employ a few grains of powdered citric acid per ounce, in a like manner, with the intention of increasing the whiteness of the compound; but the practice is not to be commended, as pommades so prepared prove injurious to the hair.

The French perfumers, who are celebrated for the variety and excellence of their pommades, divide them into four classes:—

1. POMMADES BY INFUSION. These are made by gently melting in a clean pan, over a water bath, 2 parts of hog's lard, and 1 part of beef suet (both of the finest quality, and carefully 'rendered'), and adding thereto 1 part of the given flowers, previously carefully picked and separated from foreign matter; or, if the odorous substance is a solid, then coarsely bruised, but not reduced to fine powder. The mixture is next digested at a very gentle heat for from 12 to 24 hours, with occasional stirring, the vessel being kept covered as much as possible during the whole time. The next day the mixture is reheated, and again well stirred for a short time, after which it is poured into canvas bags, and these being securely tied, are submitted to powerful pressure, gradually increased, in a screw or barrel press. This operation is repeated with the same fat and fresh flowers, several times, until the pommade is sufficiently perfumed. A good pommade requires thrice to six times its weight in flowers to be thus consumed; or of the aromatic barks and seeds a corresponding proportion. The pommades of cassia, orange flowers, and several others kept by the French perfumers, are prepared in this manner.

2. POMMADES BY CONTACT (ENFLEURAGE). These are made by spreading, with a pallette knife, simple pommade (made with lard and suet as above) on panes of glass or pewter plates, to the thickness of a finger, and sticking the surface all over with the sweet-scented flowers. These last are renewed daily for one, two, or three months, or until the pommade has become sufficiently perfumed. On the large scale, the panes are placed in small shallow frames, made of four pieces of wood nicely fitted together, and are then closely piled one upon another. On the small scale, pewter plates are generally used, and they are inverted one over the other. In some ot the perfumeries of France many thousands of *frames* are employed at once. The pommades of jasmin, jonquil, orange-flowers, narcissus, tuberose, violet, and of some other delicate flowers, are prepared in this manner.

3. POMMADES BY ADDITION. These are prepared by simply adding the fragrant essences or essential oils, in the required quantity, to the simple pommade of lard and suet to produce the proper odour. In this way the pomades of bergamotte, cédrat, cinnamon, lemons, lemon thyme, lavender, limettes, marjoram, Portugal, roses, rosemary, thyme, verbena, and about 40 others kept by the Parisian perfumers, are made.

4. MIXED POMMADES. Of these a great variety exists, prepared by the addition of judicious combinations of the more esteemed perfumes to simple pommade; or, by the admixture of the different perfumed pommades, whilst in the semi-liquid state. (See *below*.)

The COLOURED POMMADES derive their respective tints from tinctorial matter added to the melted fat before perfuming it. GREEN is given by gum guaiacum (in powder), or by the green leaves or tops of spinach, parsley, lavender, or walnut;—RED, by alkanet root and carmine;—YELLOW and ORANGE, by annatto or palm oil;—WHITE POMMADES are made with mutton suet, instead of beef suet. The BROWN and BLACK hard pomatums, vended under the name of 'COSMETIQUE,' are noticed at page 372. A few compound pommades are used as skin cosmetics.

Pommade. *Syn.* POMATUM. *Prep.* 1. (PLAIN POMATUM, SIMPLE P.)—*a.* From lard, 2 lbs.; beef suet, 1 lb.; carefully rendered as above. The ordinary consistence for temperate climates.

b. Lard and suet, equal parts. For warm climates. Both may be scented at will.

2. (SCENTED POMATUM.)—*a.* Plain pomatum, 1 lb.; melt it by the least possible degree of heat, add of essence of lemon or essence of bergamot, 3 drs., and stir the mixture until it concretes. This forms the ordinary 'pomatum' of the shops.

b. Plain pomatum, 1½ lb.; essence of bergamot, 1½ dr.; essence of lemon, 1 dr.; oils of rosemary and cassia, or each, ¼ dr.; oil of cloves, 20 drops. More fragrant than the last.

Pommade, Castor Oil. *Prep.* 1. From castor oil, 1 lb.; white wax, 4 oz.; melt them together, then add, when nearly cold, of essence of bergamot, 3 drs.; oil of lavender (English), ½ dr.; essence of ambergris, 10 drops. Supposed to render the hair glossy.

2. (Crystallised.) From castor oil, 1 lb.; spermaceti, 3 oz.; melt them together, by a gentle heat, add, of essence of bergamot, 3 drs.; oil of verbena, lavender, and rosemary, of each, ½ dr.; pour it into wide-mouthed glass bottles, and allow it to cool very slowly and undisturbed.

Pommade, Cazenave's. *Prep.* From prepared beef marrow, 4 oz.; tincture of cantharides (P. Cod.), 3 to 4 drs.; powdered cinnamon, ½ oz.; melt them together, stir until the spirit has, for the most part, evaporated, then decant the clear portion, and again stir it until it concretes. Recommended as a remedy for baldness and weak hair. It is to be used night and morning; the head being washed with soap-and-water, and afterwards with salt-and-water, before applying it. Dr. Cattell scents it with the oils of origanum and bergamot, instead of cinnamon.

Pommade Collante. *Prep.* 1. Oil of almonds, 3 oz.; white wax, ¾ oz.; melt them together, and add, of tincture of mastic (strong), 1 oz.; essence of bergamot, ½ dr. *Used* to stiffen the hair, and keep it in form.

2. Burgundy pitch (true), 3 oz.; white wax, 2 oz.; lard, 1 oz.; melt, and, when considerably cooled, stir in, of tincture of benzoin, 1 oz.; essence of bergamot, ½ dr. *Used* to fasten false curls.

Pommade, Cowslip. *Prep.* From plain pommade, 2 lbs.; essence of bergamot, 3 drs.; essence of lemon and essence of orange peel, of each, 1 dr.; huile au jasmin and essence de petit grain, of each, ½ dr.; essence of ambergris, 6 drops.

Pommade, Crystallised. *Prep.* From olive oil and spermaceti, as crystallised castor oil pommade, with scent at will.

Pommade d'Alyon. Ointment of nitric acid (page 853).

Pommade de Beaute. *Prep.* From oil of almonds, 2 oz.; spermaceti, 2 drs.; white wax, 1½ dr.; glycerin, 1 dr.; balsam of Peru, ½ dr.; mixed by a gentle heat. *Used* as a skin cosmetic, as well as for the hair.

Pommade de Casse. *Prep.* From plain pommade, 1 lb.; palm oil, ½ oz.; melt, pour off the clear, and add oil of cassia and huile au jasmin, of each, 1 dr.; neroli, 20 drops; oil of verbena or lemon grass, 15 drops; otto of roses, 5 drops; and stir until nearly cold. Very fragrant.

Pommade d'Hebe. *Prep.* To white wax, 1 oz., melted by a gentle heat, add, of the juice of lily bulbs and Narbonne honey, each, 2 oz.; rose water, 2 drs.; otto of roses, 2 drops. Applied night and morning to remove wrinkles.

Pommade de Ninon de l'Enclos. *Prep.* Take of oil of almonds, 4 oz.; prepared lard, 3 oz.; juice of houseleek, 3 fl. oz. *Used* chiefly as a skin cosmetic. Said to be very softening and refreshing.

Pommade Divine. *Prep.* 1. Washed and purified beef marrow, 2 lbs.; liquid styrax, cypress wood, and powdered orris root, of each, 2 oz.; powdered cinnamon, 1 oz.; cloves and nutmegs, of each (bruised), ½ oz.; digest the whole together by the heat of a water bath for six hours, and then strain through flannel.

2. Plain pommade, 2 lbs.; essence of lemon and bergamot, of each, 2 drs.; oils of lavender and origanum, of each, 1 dr.; oils of verbena, cassia, cloves, and neroli, of each, 12 drops; huile au jasmin, 3 drs.; essence of violets, ½ oz.

Pommade, Dupuytren's *Prep.* 1. Take of prepared beef marrow, 12 oz.; melt, add of baume nerval (see page 852), 4 oz.; Peruvian balsam and oil of almonds, of each, 3 oz.; and, lastly, of alcoholic extract of cantharides, 36 grs.; (dissolve in) rectified spirit, 3 fl. drs. This is the original formula for this celebrated pommade. The following modifications of it are now commonly employed:—

2. (Cap.) Beef marrow, 2 oz.; alcoholic extract of cantharides, 8 grs.; rose oil, 1 dr.; essence of lemons, 30 drops.

3. (Guibourt.) Beef marrow and 'baume nerval' (page 852), of each, 1 oz.; rose oil, 1 dr.; alcoholic (or acetic) extract of cantharides, 6 grs.; (dissolved in) rectified spirit, q. s. These compounds are *used* to promote the growth of the hair and to prevent baldness, for which purpose they are usually coloured and scented according to the taste of the manufacturer. To be useful, they should be well rubbed on the scalp, at least once daily, for several weeks, and the head should be occasionally washed with soap-and-water.

Pommade, East India. *Prep.* Take of suet, 3 lbs.; lard, 2 lbs.; bees' wax (bright), ½ lb.; palm oil, 2 oz.; powdered gum benzoin, 3 oz.; musk (previously triturated with a little lump sugar), 20 grs.; digest the whole together in a covered vessel, by the heat of a water bath, for 2 hours, then decant the clear portion, and add, of essence of lemon, ½ oz.; oil of lavender, ¼ oz.; oils of cloves, cassia, and verbena, of each, ½ dr. A favourite pommade in the East Indies.

Pommade, Hard. *Syn.* HARD POMATUM, ROLL P. *Prep.* 1. Take of beef suet, 2 lbs.; yellow wax, ¼ lb.; spermaceti, 1 oz.; powdered benzoin, ¼ oz.; melt them together, then add, of oil of lavender, 2 drs.; essence of ambergris, ½ dr. Before it concretes pour it into moulds of paper or tin foil.

2. Mutton suet and lard, of each, 1 lb.; white wax, 6 oz.; melt, and add, of essence of lemon, 2 drs.; oil of cassia, ½ dr. Other perfumes may be employed at will.

Hard pomatums are used to gloss and set the hair. They act both as 'pommade' and 'fixateur.' See COSMETIQUE.

Pommade, Macassar. *Prep.* From castor oil, 5 oz.; white wax, 1 oz.; alkanet root, ½ dr.; heat them together until sufficiently coloured, then strain, and add, oil of origanum and oil of rosemary, of each, 1 dr.; oil of nutmeg, ½ dr.; otto of roses, 10 drops. Said to be equal in efficacy to MACASSAR OIL.

Pommade, Marechal. Plain pommade scented by digesting it with *poudre marechale.*

Pommade, Marrow. *Syn.* MARROW POMATUM. *Prep.* From prepared beef marrow, ½ lb.; beef suet, ¼ lb.; palm oil, ¼ oz.; melted together and scented at will.

Pommade, Millefleur. *Prep.* From plain pommade scented with a mixture of essence of lemon and essence of ambergris, each, 4 parts; oil of lavender, 2 parts; oil of cloves and essence de petit grain, of each, 1 part; or with other like perfumes so proportioned to each other that no one shall predominate. Much esteemed.

Pommade, Roll. See HARD POMMADE.

Pommade, Roman. See *below*.

Pommade, Rose. *Syn.* ROSE POMATUM. This is plain pommade or hard lard, which has been well beaten with eau de rose, or, better still, scented with otto of roses. It is sometimes tinged with alkanet root.

Pommade, Soft. Plain pomatum scented at will.

Pommade, Soubeiran's. *Prep.* From beef marrow, 1½ oz.; oil of almonds, ½ oz.; disulphate of quinine, 1 dr. Recommended for strengthening and restoring the hair.

Pommade, Vanilla. *Syn.* ROMAN POMMADE, POMMADE À LA VANILLE, POMMADE ROMAIN. From plain pommade and pommade à la rose, of each, 12 lbs.; powdered vanilla, 1 lb.; heat them together in a water bath, stir constantly for 1 hour, let it settle for another hour, decant the clear, and add, oil à la rose, 2½ lbs.; bergamot, 4 oz.

POPPY. *Syn.* WHITE POPPY; PAPAVER SOMNIFERUM, L. The capsules or fruit ("mature"— Ph. L.; "not quite ripe"—Ph. E.) form the poppies or poppy-heads of the shops (PAPAVERIS CAPSULÆ; PAPAVER—Ph. L. E. & D.). They are anodyne and narcotic, similar to opium, but in only a very slight degree. The seeds (MAW SEED), which are sweet, oleaginous, and nutritious, are used as a substitute for almonds in confectionery and mixtures, and are pressed for their oil. See EXTRACT, OPIUM, and SYRUP.

Poppy, Red. *Syn.* CORN POPPY, CORN ROSE; PAPAVER RHŒAS, L. The fresh petals or flowers (RHŒADOS PETALA; RHŒAS—Ph. L. E. & D.) are reputed pectoral, but are chiefly employed on account of their rich colour. See SYRUP.

POP'ULIN. *Syn.* POPULINUM, L. A peculiar neutral, crystallisable substance, formerly supposed to be an alkaloid, found, associated with SALICIN, in the root-bark of the *Populus tremula* (Linn.), or aspen.

Prep. Concentrate the decoction by a gentle heat, and set it aside in a cool situation to crystallise; dissolve the crystals which are deposited in rectified spirit, decolour them by digestion with animal charcoal, filter, and again crystallise. To render them still purer, they may be redissolved and crystallised a second and a third time, if necessary.

Prop., &c. It resembles salicin in appearance and solubility, but, unlike that substance, has a penetrating sweet taste. Dilute acids convert it into benzoic acid, grape sugar, and saliretin; and with a mixture of sulphuric acid and bichromate of potassa it yields a large quantity of salicylous acid. It appears to be tonic, stomachic, and febrifuge.

POR'CELAIN. See POTTERY.

PORK. The value of pork as an article of diet is well known. That from the young and properly fed animal is savoury, easy of digestion, and, when only occasionally employed, highly wholesome; but it is apt to disagree with some stomachs, and should, in such cases, be avoided. To render it proper for food, it should be thoroughly but not overcooked. When salted, it is less digestible. The frequent use of pork is said to favour obesity, and to occasion disorders of the skin, especially in the sedentary.

POR'PHYRIZED, PORPHORIZA'TION. Words coined by recent pharmaceutical writers, and possessing similar meanings to LEVIGATED and LEVIGATION.

PORPHY'ROXIN. A neutral crystallisable substance discovered by Merck in opium. It is soluble in both alcohol and ether, insoluble in water, and is characterised by assuming a purplish-red colour when heated in dilute hydrochloric acid.

PORRI'GO. See RING-WORM.

POR'TER. This well-known beverage, now the common drink of the inhabitants of London, by whom it is generally termed 'beer,' originated with a brewer named Harwood, in 1722. Previously to this date, 'ale,' 'beer,' and 'twopenny,' constituted the stock in trade of the London publican, and were drunk, either singly or together, under the names of 'half-and-half' or 'three threads,' for which the vendor was compelled to have recourse to two or three different casks, as the case might demand. The inconvenience and trouble thus incurred led Mr. Harwood to endeavour to produce a beer which should possess the flavour of the mixed liquors. In this he succeeded so well that his new beverage rapidly superseded the mixtures then in use, and obtained a general preference among the lower classes of the people. At first this liquor was called 'entire' or 'entire butt,' on account of it being drawn from one cask only, but it afterwards acquired, at first in derision, the now familiar name of 'porter,' in consequence of its general consumption among porters and labourers. The word 'entire' is still, however, frequently met with on the signboards of taverns about the metropolis.

The characteristics of pure and wholesome porter are its transparency, lively dark brown colour, and its peculiar bitter and slightly burnt taste. Originally, these qualities were derived from the 'high-dried malt,' with which alone it was brewed. It is now generally, if not entirely, made from 'pale' or 'amber malt,' mixed with a sufficient quantity of 'patent' or 'roasted malt' to impart the necessary flavour and colour. Formerly, this liquor was 'vatted' and 'stored' for some time before being sent out to the retailer, but the change in the taste of the public during the last quarter of a century in favour of the mild or new porter has rendered this unnecessary. The best 'draught porter,' at the time of its consumption, is now only a few weeks old. In this state only would it be tolerated by the modern beer-drinker. The old and acid beverage that was formerly sold under the name of porter would be rejected at the present day, as 'hard' and unpleasant, even by the most thirsty votaries of malt liquor.

The 'beer' or 'porter' of the metropolitan brewers is essentially a weak mild ale, coloured and flavoured with roasted malt. Its richness in sugar and alcohol, on which its stimulating and nutritive properties depend, is hence less than that of an uncoloured mild ale brewed from a like original quantity of malt. For pale malt is assumed to yield 80 to 84 lbs. of saccharine per quarter; whereas the torrefied malt employed by the porter-brewers only yields 18 to 24 lbs. per quarter, and much of even this small quantity is altered in its properties, and is incapable of undergoing the vinous fermentation. In the manufacture of porter there is a waste of malt which does not occur in brewing ale; and the consumer must, therefore, either pay a higher price for it or be content with a weaker liquor.

The hygienic properties of porter, for the most part, resemble those of other malt liquors. Some members of the faculty conceive that it is better suited to persons with delicate stomachs and weak digestion than either ale or beer. That there may be some reason for this preference, in such cases, we are not prepared to deny, but undoubtedly, when the intention is to stimulate and nourish the system, ale is preferable. Certain it is, however, that the dark colour and strong taste of porter render its adulteration easier than that of ale, whilst such adulteration is more difficult of detection than in the paler varieties of malt liquors. "For medical purposes, 'bottled porter' (CEREVISIA LAGENARIA) is usually preferred to 'draught porter.' It is useful as a restorative in the latter stages of fever, and to support the powers of the system after surgical operations, severe accidents, &c." (Pereira, ii, 982.) When 'out of condition' or adulterated, porter, more than perhaps any other malt liquor, is totally unfit for use as a beverage, even for the healthy; and when taken by the invalid, the consequences must necessarily be serious. Dr. Ure says that pure porter, "when drank in moderation, is a far wholesomer beverage for the people than the thin acidulous wines of France and Germany."

The manufacture of porter has been described in our article on BREWING, and is also referred to above. It presents no difficulty or peculiarity, beyond the choice of the proper materials. A mixture of 'brown' and 'black malt' is thought to yield a finer flavour and colour to the pale malt that gives the body to the liquor than when 'black' or 'roasted malt' is employed alone. The proportion of the former to the latter commonly varies from 1-6th to 1-4th. When 'black malt' is alone used, the proportion varies from the 1-10th to 1-15th. 1 lb. of 'roasted malt,' mashed with about 79 lbs. of pale malt, is said to be capable of imparting to the liquor the flavour and colour of porter. The following formulæ were formerly commonly employed in London:—

1. (DRAUGHT PORTER.) From pale malt, 3½ qrs.; amber malt, 3 qrs.; brown malt, 1½ qr.; mash at twice with 28 and 24 barrels of water, boil with brown Kent hops, 56 lbs., and set with yeast, 40 lbs. *Prod.* 28 barrels, or 3½ times the malt, besides 20 brls. of table-beer from a third mashing.

2. (BOTTLING PORTER; BROWN STOUT.) From pale malt, 2 qrs.; amber and brown malt, of each, 1½ qr.; mash at 3 times with 12, 7, and 6 brls. of water, boil with hops, 50 lbs., and set with yeast, 26 lbs. *Prod.* 17 brls., or 1½ times the malt.

The purity and quality of porter, as well as of other malt liquors, may be inferred in the manner noticed under BEER (see *page* 201); but can only be positively determined by a chemical examination. For this purpose several distinct operations are required:—

1. *Richness in* ALCOHOL. This may be correctly found by the method of M. Gay-Lussac; or, from the boiling-point. (See ALCOHOLOMETRY and EBULLIOSCOPE.) The method with anhydrous carbonate of potassa (see *q. a., page* 47) will also give results sufficiently near to the truth for ordinary purposes, when strong or old beer is operated on. The quantity of the liquor tested should be 3600 water-grains measure; and it should be well agitated, with free exposure to the air, after weighing it, but before testing it for its alcohol. The weight of alcohol found, multiplied by 1·8587, gives its equivalent in sugar. This may be converted into 'brewer's pounds' or density per barrel, as below.

2. *Richness in* SACCHARINE OR EXTRACTIVE MATTER. A like quantity of the liquor under examination, after being boiled for some time to dissipate its alcohol, is made up with distilled water, so as to be again exactly equal to 3600 water-grains measure. The sp. gr. of the resulting liquid is then taken, and this is reduced to 'brewer's pounds' per barrel, by multiplying its excess of density above that of water (or 1000) by 360, and pointing off the three right-hand figures as decimals.

3. ACETIC ACID OR VINEGAR. This is determined by any of the common methods of ACIDIMETRY (which *see*; see also ACETIMETRY). Each grain of anhydrous acetic acid so found represents 1·6765 gr. of sugar.

4. *Gravity of* ORIGINAL WORT. This is obtained by the addition of the respective quantities of saccharine matter found in Nos. 1, 2, and 3 (*above*). These results are always slightly under the true original density of the wort, as cane sugar appears to have been taken by the Excise as the basis of their calculations. More correctly, 12% of proof spirit is equivalent to 19lbs. of saccharine per barrel. 10½lbs.

of saccharine are equiv. to 1 gall. of proof spirit.

5. *Detection of* NARCOTICS. This may be effected either by the method described under ALKALOID, or by one or other of the following processes:—

a. ½ gall. of the beer under examination is evaporated to dryness in a water bath; the resulting extract is boiled for 30 or 40 minutes in a covered vessel with 10 or 12 fl. oz. of alcohol or strong rectified spirit, the mixture being occasionally stirred with a glass rod, to promote the action of the menstruum; the alcoholic solution is next filtered, treated with a sufficient quantity of solution of diacetate of lead to precipitate colouring matter, and again filtered; the filtrate is treated with a few drops of dilute sulphuric acid, again filtered, and then evaporated to dryness; it may then be tested with any of the usual reagents, either in the solid state or after being dissolved in distilled water. Or, the extract, obtained as above, may be boiled as directed with rectified spirit, the solution filtered, the spirit distilled off, and a small quantity of pure liquor of potassa added to the aqueous residue, which is then to be shaken up with about 1 fl. oz. of ether; lastly, the ethereal solution, which separates and floats on the surface, is decanted, evaporated, and the residuum tested, as before. The alkaline liquid, from which the ether has been decanted, is then separated from any precipitate which may have formed, and both of these separately tested for alkaloids.

b. From 2 to 3 oz. of purified animal charcoal are diffused through ½ gall. of the beer, and is digested in it, with frequent agitation, for from 8 to 12 hours; the liquor is next filtered, and the charcoal collected on the filter is boiled with about ½ pint of rectified spirit; the resulting alcoholic solution is then further treated as above, and tested. This answers well for the detection of strychnine or nux vomica.

6. PICRIC ACID. This substance, which was formerly employed to impart bitterness to London porter in lieu of hops, may be detected as follows:—

a. A portion of the liquor agitated with a little solution of diacetate of lead loses its bitter flavour if it depends on hops, but retains it if it depends on picric acid.

b. Pure beer is decoloured and deodorised by animal charcoal; but beer containing picric acid, when thus treated, retains a lemon-yellow colour and the odour.

c. Unbleached sheep's wool, boiled for six or ten minutes, and then washed, takes a canary-yellow colour if picric acid be present. This test is so delicate that 1 gr. of the adulterant, in 150,000 grs. of beer is readily detected.

7. MINERAL MATTER.—*a.* A weighed quantity of pure beer evaporated to dryness, and then incinerated, does not furnish more than from ·20% to ·35% of ash, the quantity varying within these limits with the strength of the liquor and the character of the water used in brewing it.

b. A solution of this ash, made by decoction with distilled water, should be only rendered slightly turbid by solutions of acetate of lead, bichloride of platinum, nitrate of baryta, nitrate of silver, oxalate of ammonia, and sulphuretted hydrogen.

c. If the beer contained common salt, the above solution will give a cloudy white precipitate with a solution of nitrate of silver. Each grain of this precipitate is equivalent to ⅖ gr. of common salt (nearly).

d. If GREEN COPPERAS (sulphate of iron) is present, ferridcyanide of potassium gives a blue precipitate, and ferrocyanide of potassium a bluish-white one, turning dark blue in the air; solution of chloride of barium gives a white precipitate, each grain of which, after being washed, dried, and ignited, represents 1·188 gr. of crystallised protosulphate of iron.

e. The ash, digested in water slightly acidulated with nitric acid, and then boiled, yields a solution which, when cold, gives a black precipitate with sulphuretted hydrogen, and a white one with dilute sulphuric acid, when lead is present.

For further information connected with this subject, see ALCOHOLOMETRY, ALE, BEER, BREWING, MALT LIQUORS, &c.

PORT-FIRE. A paper tube, from 9 to 12 inches in length, filled with a slow burning composition of metal powder, nitre, and sulphur, rammed moderately hard, by a similar process to that adopted for small rockets. It is used in lieu of a touch-match, to fire guns, mortars, pyrotechnical devices, &c.

PORTLAND CEMENT. A species of mortar formed by calcining a mixture of limestone and argillaceous earth, and grinding the calcined mass to powder, in which state it must be preserved from the air. It is characterised by absorbing a large quantity of water, and then rapidly becoming solid, and, after a time, acquiring considerable hardness. See MORTAR and CEMENT.

POSOL'OGY. See *Dose.*

POS'SET. *Syn.* POSSETUM, L. Milk curdled with wine or any other slightly acidulous liquor. It is usually sweetened with either sugar or treacle, and is taken hot.

Prep. From new milk, ½ pint; sherry or marsala, 1 wine-glassful; treacle, 1 or 2 tablespoonfuls, or q. s.; heat them together in a clean saucepan until the milk coagulates. This is called 'treacle posset' or 'molasses posset,' and, taken on retiring to rest, is highly esteemed in some parts of the country as a domestic remedy for colds. Lemon juice, strong old ale, or even vinegar, is occasionally substituted for wine, and powdered ginger or nutmeg added at will.

POT'ASH. The 'potash,' or 'potashes,' of commerce is an impure carbonate of potassa, so named after the pots or vessels in which it was first made. The 'potash,' or 'potassa,' of the chemist, is the hydrate of potassium, a peculiar metal, which is more particularly referred to below. The word potash is vulgarly applied to the crude or commercial carbonate of potassium. See CARBONATE OF POTASSIUM, &c.

POTAS'SIUM. K. The metallic base of potash. It was discovered, in 1807, by Sir H. Davy, who obtained it by submitting moistened potassium hydrate, under a film of naphtha, to the action of a powerful voltaic current. It has since been procured by easier methods, of which the following, invented by Brunner, is the best.

Prep. An intimate mixture of carbonate of potassium and charcoal is prepared by calcining, in a covered iron pot, the crude tartar of commerce; when cold, it is rubbed to powder, mixed with 1-10th part of charcoal in small lumps, and quickly transferred into a retort of stout hammered iron; the latter may be one of the iron bottles in which quicksilver is imported, a short and somewhat wide iron tube having been fitted to the aperture; the retort, thus charged, is placed upon its side, in a furnace so constructed that the flame of a very strong fire, preferably fed with dry wood, may wrap round it, and maintain every part of it at a very high and uniform degree of heat. A copper receiver, divided in the centre by a diaphragm, is next connected to the iron pipe, and kept cool by the application of ice, whilst the receiver itself is partly filled with mineral naphtha, to preserve the newly formed potassium as it distils over. The arrangement of the apparatus being completed, the fire is gradually raised until the requisite temperature, which is that of full whiteness, is reached, when decomposition of the alkali by the charcoal commences, carbonic oxide gas is abundantly disengaged, and potassium distils over, and falls in large drops into the liquid. To render the product absolutely pure, it is redistilled in an iron or green-glass retort, into which some naphtha has been put, that its vapour may expel the air, and prevent the oxidation of the metal. The pieces of charcoal are introduced for the purpose of absorbing the melted carbonate of potassium, and preventing its separation from the finely divided carbonaceous matter. *Prod.* 3% to 4% of the weight of tartar acted on; 1 lb. yielded 280 grs.

Prop., &c. Pure potassium is a brilliant white metal, with a high lustre; at the common temperature of the air it is soft, and may be easily cut with a knife, but at 32° Fahr. it is brittle and crystalline; it melts completely at 136° Fahr., and in close vessels distils unaltered at a low red heat. Sp. gr. ·865. Its most remarkable property is its affinity for oxygen, which is so great that it takes it from most other substances' containing it. Exposed to the air, its surface is instantly tarnished, and quickly becomes covered with a crust of oxide or hydrate. It inflames spontaneously when thrown on water, and burns with a beautiful purple or purple-red flame, yielding a pure alkaline solution. It can only be preserved in naphtha, rock oil, or some other fluid hydrocarbon.

The salts of potassium are all soluble in water, the tartrate, periodate, and fluosilicate being the least so; they are usually colourless, unless the acid be coloured, crystallise readily, and form numerous double compounds. They can be recognised as follows:—

Sulphuretted hydrogen, sulphide of ammonium, and carbonate of ammonium, do not affect them. A solution of tartaric acid, added, in excess, to moderately strong neutral or alkaline solutions of potassium salts, gives a quickly subsiding, gritty or crystalline, white precipitate, which is redissolved on heating the liquid, and again separates as it cools; and is also soluble in aqueous solutions containing free alkali, or free mineral acids. Platinic chloride produces, in neutral and acid solutions, a yellow crystalline precipitate. Alkaline solutions require to be first slightly acidulated with hydrochloric acid. The separation of the precipitate here, as well as that produced by tartaric acid, is promoted by violent agitation and friction against the sides of the vessel, and the delicacy of both is increased by the addition of some alcohol. When converted into carbonate by igniting with excess of carbonate of ammonium and alcohol, and treated with sulphuretted hydrogen solution and nitroprusside of sodium, gives a splendid violet colour, turning through red to green on standing.

Potassium salts give with sodium periodate and hydro-fluosilicic acid, white precipitates soluble in much water.

Heated in the inner flame of the blowpipe on platinum wire, they impart a violet coloration, masked, however, by a mere trace of sodium salts.

Potassium, Acetate of. $KC_2H_3O_2$. *Syn.* ACETATE OF POTASH, POTASSIC ACETATE; POTASSÆ ACETAS (B. P., Ph. L. E. D.). *Prep.* (Ph. L.) Acetic acid, 26 fl. oz.; distilled water, 12 fl. oz.; mix, and add, gradually, carbonate of potassium, 1 lb., or q. s. to saturate the acid; next, filter the solution, and evaporate it by the heat of a sand bath, gradually applied, until the salt is dried.

Prop., &c. Acetate of potassium, prepared as above, occurs in shining white masses, having a foliated soft texture, a slight but peculiar odour, and a warm sharp taste; it deliquesces in the air; dissolves in rather less than its own weight of water, and in about twice its weight of alcohol; and by exposure to a red heat is converted into pure carbonate of potassium. In trade it is preserved in well-corked and sealed bottles.

Pur. It is entirely soluble in water, and in rectified spirit. These solutions neither affect litmus nor turmeric, nor are they disturbed by either chloride of barium or nitrate of silver; but if from a stronger solution anything is thrown down by nitrate of silver, the same is again dissolved on the addition of water or dilute nitric acid. Sulphuric acid being added, the vapour of acetic acid is evolved. 100 grs. of this salt, digested in sulphuric acid, the solution evaporated, and the residuum dried at a high temperature, furnish 88·8 grs. of sulphate of potassium.

Uses, &c. Acetate of potassium has been found useful in dropsies, febrile affections, jaundice, scurvy, calculus, and several chronic skin diseases. During its exhibition the urine becomes at first neutral, and then alkaline, owing to the salt being converted into carbonate of potassium in the system.—*Dose.* As a diaphoretic and antiscorbutic, 15 to 20 grs.; as a diuretic, 20 to 60 grs.; as an aperient, 2 to 3 drs.; in each case dissolved in some bland liquid, or in the infusion of some mild vegetable bitter.

Potassium, Arseniate of. KH_2AsO_4. *Syn.* ARSENIATE OF POTASSA, MONOPOTASSIC ARSENIATE, POTASSIUM DYHYDRIC ARSENIATE; POTASSÆ BINARSENIAS, L. *Prep.* Take of arsenious acid (white arsenic) and nitrate of potassium, of each, in powder, 1 part; heat the mixture to dull redness in a glass flask, until it fuses and red vapours cease to be evolved; dissolve the residuum, when cold, in boiling distilled water, 50 parts; concentrate the solution by evaporation, and set it aside to crystallise.

Prop., &c. This salt forms large crystals, which are permanent in dry air, soluble in about 4½ parts of water, and insoluble in alcohol. It is reputed tonic, alterative, and antiperiodic.—*Dose.* $\frac{1}{16}$ to $\frac{1}{8}$ gr., dissolved in sweetened water. It is also used to form a resist-paste in calico-printing, and in the manufacture of cobalt-blue.

Potassium, Borate of. $K_4B_4O_8$. *Syn.* POTASSÆ BORAS, L. *Prep.* From dry carbonate of potassium and dry boracic acid, equal parts, reduced to powder, and heated to redness in a covered crucible; the sublimed mass, when cold, being dissolved in boiling water, and the filtered solution concentrated by evaporation, and then set aside to crystallise; or at once completely evaporated to dryness.—*Dose.* 1 to 6 grs.; in calculi, &c.

Potassium, Borotartrate of. *Syn.* POTASSÆ BOROTARTRAS, CREMOR TARTARI SOLUBILIS, L.; CRÈME DE TARTRE SOLUBLE, Fr. *Prep.* (P. Cod.) Crystallised boracic acid, 1 part; bitartrate of potassium, 4 parts; water, 24 parts; dissolve by the aid of heat, in a silver basin, and, constantly stirring, evaporate the resulting solution, either to dryness, and then powder it, or merely to a syrupy consistence, when it may be spread upon plates, and dried in scales, by the heat of a stove. It must afterwards be preserved from the air.

Prop, &c. A white, deliquescent powder, freely soluble in water. It has been used as a solvent for lithic calculi, and in gout, &c.—*Dose.* 15 to 30 grs. In doses of 2 to 3 drs. it is laxative, and is very popular as such on the Continent.

Potassium, Bromide of. KBr. *Syn.* POTASSII BROMIDUM (B. P.). *Prep.* Exactly as the iodide, which it resembles in its character, only being somewhat less soluble in water and more in alcohol. Employed in similar cases and given in similar doses to the iodide.

Potassium, Carbonate of. K_2CO_3. *Syn.* CARBONATE OF POTASSA, SUBCARBONATE OF POTASSA, SALT OF TARTAR; POTASSÆ CARBONAS (B.P., Ph. L. E. D.). Impure or crude carbonate of potassium is chiefly imported from America and Russia, and is obtained by lixiviating wood ashes, and evaporating the solution to dryness. The mass is then transferred into iron pots, and is kept in a state of fusion for several hours, until it becomes quiescent, when the heat is withdrawn, and the whole is left to cool. It is next broken up and packed in air-tight barrels, and in this state constitutes the 'potashes' or 'potash' of commerce. Another method is to transfer the black salts, or product of the first evaporation, from the kettles to a large oven or furnace, so constructed that the flame is made to play over the alkaline mass, which is kept constantly stirred by means of an iron rod. The ignition is continued until the impurities are burned out, and the mass changes from a blackish tint to a dirty or bluish white. The whole is next allowed to cool, and is then broken into fragments, and packed in casks as before. It now constitutes 'pearlash.'

When pearlash is dissolved in cold distilled water, the solution depurated, filtered, and crystallised, or simply evaporated to dryness, it forms 'refined ashes,' or carbonate of potash sufficiently pure for most pharmaceutical and technical purposes. The granulated carbonate of potash, salt of tartar, or prepared kali, of the shops, is simply refined ashes which, during the evaporation, and more especially towards the conclusion of the desiccation, has been assiduously stirred, so that it may form small white granulations, instead of adhering together to form an amorphous solid mass. In this state it constitutes the ordinary or carbonate of potassa of the Pharmacopœias. Ordinary potash or pearlash may be refined as follows:—Raw potash, 10 parts, is dissolved in cold water, 6 parts, and the solution is allowed to remain for 24 hours, in a cool place; it is then filtered, and somewhat concentrated by evaporation, crystallisation being prevented by continually stirring the mass until the whole is nearly cold; it is next decanted into a strainer, and the mother-liquor allowed to drip off; the residuum is evaporated to dryness at a gentle heat, and redissolved in an equal quantity of cold distilled water; the new solution, after filtration, is again evaporated to dryness. The product is quite free from potassium sulphate, and is nearly free from both potassium chloride and silicates.

Potassium, Pure Carbonate of. CARBONATE OF POTASSA (POTASSÆ CARBONAS PURUM—Ph. E. & D., and Ph. L., 1836).—(Ph. L., 1836.) From bicarbonate of potassium, in crystals, heated to redness in a crucible.

(Ph. E.) As the last. Or, more cheaply, by dissolving bitartrate of potassium in thirty parts of boiling water, separating and washing the crystals which form on cooling, heating them in a loosely covered crucible to redness as long as fumes are discharged, breaking down the mass, and roasting it in an oven for two hours, with occasional stirring; lixiviating the product with (cold) distilled water, filtering the solution thus obtained, evaporating it to dryness, granulating the salt towards the close by brisk agitation, and, lastly, heating the granular salt thus obtained nearly to redness.

(Ph. D.) Bitartrate of potassium, 2 lbs., is exposed to a red heat in an iron crucible, as before; the powdered calcined mass is boiled for 20 minutes in water, 1 quart, the solution filtered, and the filter washed with water, 1 pint, to which ammonium sesquicarbonate, ½ oz., has been added; the mixed and filtered liquors are evaporated to dryness, and, a low red heat having been applied, the residuum is rapidly reduced to powder in a warm mortar, and at once enclosed in (dry and) well-stopped bottles.

Prop. These are well-known. It exhibits most of the properties of hydrate of potassium, but in a vastly less degree. It is very deliquescent, effervesces with acids, exhibits a marked alkaline reaction with test paper, is insoluble in alcohol, but dissolves in less than its own weight of water, its affinity for the last being so great that it takes it from alcoholic mixtures.

Pur., &c. Carbonate of potassium frequently contains an undue quantity of water, as well as silicic acid, sulphates, and chlorides. The water may be detected by the loss of weight the salt suffers when heated; the silica, by adding to it hydrochloric acid in excess, evaporating to dryness, and igniting the residuum, by which this contamination is rendered insoluble; the sulphates and chlorides may be detected by adding nitric acid in excess, and testing the liquid with nitrate of silver and chloride of barium. If the former produces a white precipitate, a chloride is present; and if the latter does the same, the contamination is a sulphate. Carbonate of potassium deliquesces in the air, and is almost entirely dissolved by water; in an open vessel it spontaneously liquefies. It changes the colour of turmeric brown. Supersaturated with nitric acid, neither carbonate of sodium nor chloride of barium throws down anything, and nitrate of silver very little. 100 grs. lose 16 grs. of water by a strong red heat; and the same weight loses 26·3 grs. of carbonate anhydride when placed in contact with dilute sulphuric acid.

Potassium, Bicarbonate of. $KHCO_3$. *Syn.* POTASSIUM HYDROGEN CARBONATE, BICARBONATE OF POTASSA; POTASSÆ BICARBONAS (B.P., Ph. L. E. & D.). *Prep.* 1. (Ph. L. 1836.) Carbonate of potassium, 6 lbs.; distilled water, 1 gall.; dissolve, and pass carbonic anhydride (from chalk and sulphuric acid diluted with water) through the solution to saturation; apply a gentle heat, so that whatever crystals have been formed may be dissolved, and set aside the solution, that crystals may again form; lastly, the liquid being poured off, dry them.

2. (Ph. D.) Carbonic anhydride, obtained by the action of dilute hydrochloric acid on chalk (the latter contained in a perforated bottle immersed in a vessel containing the acid), is passed, by means of glass tubes connected by vulcanised India rubber, to the bottom of a bottle containing a solution of carbonate of potassium, 1 part, in water, 2½ parts; as soon as the air is expelled from the apparatus the corks through which the tubes pass are rendered air-tight, and the process left to itself for a week; the crystals thus obtained are then shaken with twice their bulk of cold water, drained, and dried on bibulous paper, by simple exposure to the air. From the mother-liquor, filtered, and concentrated to one half, at a heat not exceeding 110° Fahr., more crystals may be obtained. The tube immersed in the solution of carbonate of potassium will have to be occasionally cleared of the crystals with which it is liable to become choked, else the process will be suspended.

3. (Apothecaries' Hall, London.) Potassium carbonate, 100 lbs.; distilled water, 17 galls.; dissolve, and saturate the solution with carbonic anhydride, as in No. 1, when 35 to 40 lbs. of crystals of bicarbonate of potassium may be obtained; next dissolve carbonate of potassium, 50 lbs., in the mother-liquor, and add enough water to make the whole a second time equal to 17 galls.; the remaining part of the operation is then to be performed as before. This plan may be repeated again and again, for some time, provided the carbonate used is sufficiently pure.

4. (Ph. E.) Take of carbonate of potassium, 6 oz.; sesquicarbonate of ammonium, 3¼ oz.; triturate them together, and, when reduced to a very fine powder and perfectly mixed, make them into a stiff paste with a very little water; dry this, very carefully, at a heat not higher than 140° Fahr., until a fine powder, perfectly devoid of ammoniacal odour, be obtained, occasionally triturating the mass towards the end of the process.

5. (Commercial.) From carbonate of potassium, in powder, made into a paste with water, and exposed for some time on shallow trays, in a chamber filled with an atmosphere of carbonic anhydride, generated by the combustion of either coke or charcoal, and purified by being forced through a cistern of cold water; the resulting salt is next dissolved in the least pos-

sible quantity of water at the temperature of 120° Fahr., and the solution filtered and crystallised.

Prop. It is soluble in 4 times its weight of water at 60° Fahr.; is fixed in the air, but loses carbonic acid below the temperature of a carbonate at a red heat. It possesses the general alkaline properties of carbonate of potassium, but in an inferior degree, having only a slightly alkaline taste, and, when absolutely pure, not affecting the colour of turmeric.

Pur. In a solution of pure bicarbonate of potassium, a solution of mercuric chloride merely causes an opalescence, or very slight white precipitate; if it contains carbonate, a brick-coloured precipitate is thrown down. From 100 grs. of the pure crystals of bicarbonate, 30·7 grs. of water and carbonic acid are expelled at a red heat. In other respects it may be tested like the carbonate.

Uses, &c. Bicarbonate of potassium is the most agreeable of all the salts of potassium, and is much used as an antacid or absorbent, and for making effervescing saline draughts. It has also been successfully employed in rheumatism, scurvy, gout, dyspepsia, and various other diseases in which the use of potassium is indicated. The *dose* is from 10 grs. to ½ dr.

$$\underbrace{\text{20 grs. bicarbonate, in crystals,}}_{\text{are equivalent to}}$$

$$\overbrace{\phantom{\text{14 grs. of crystallised nitric acid, and}}}$$

14 grs. of crystallised nitric acid,
15 grs. " tartaric acid, and
½ oz. of lemon juice.

Potassium, Chlorate of. $KClO_3$. *Syn.* CHLORATE OF POTASH; POTASSÆ CHLORAS (B. P., Ph. L. & D.), L. *Prep.* 1. Chlorine gas is conducted by a wide tube into a moderately strong and warm solution of hydrate or carbonate of potassium, until the absorption of the gas ceases, and the alkali is completely neutralised; the liquid is then kept at the boiling temperature for a few minutes, after which it is gently evaporated (if necessary) until a pellicle forms on the surface, and is next set aside, so as to cool very slowly; the crystals, thus obtained, are drained and carefully washed on a filter, with ice-cold water, and are purified by re-solution and recrystallisation. The product is chlorate of potassium. The mother-liquor, which contains much chloride of potassium mixed with some chlorate, is either evaporated for more crystals (which are, however, less pure than the first crop) or is preserved for a future operation.

Obs. The product of the above process is small, varying from 10 to 45% of the weight of the potassium consumed in it, according to the skill with which it is conducted; this apparent loss of potassium arises from a large portion of it being converted into chloride, a salt of comparatively little value. The following processes have been devised principally with the view of preventing this waste, or of employing a cheaper salt of potassium than the carbonate:—

2. A solution of chloride of lime is precipitated with a solution of carbonate of potassium, and the liquid, after filtration, saturated with chlorine gas; it is then evaporated and crystallised as before. Dr. Ure has suggested the substitution of sulphate of potassium for the carbonate, by which the process would be rendered very inexpensive.

3. Carbonate of potassium, 69 parts of the dry or 82 parts of the granulated; hydrate of calcium, 37 parts (dry fresh slaked lime); both in powder; are mixed together, and exposed to the action of chlorine gas, to saturation; (the gas is absorbed with great rapidity, the temperature rises above 212° Fahr., and water is freely evolved); the heat, with free exposure, is then maintained at 212° for a few minutes (to remove some trace of 'hypochlorite'), the residuum, consisting of chlorate of potassium and chloride of calcium, is treated with hot water, and the chlorate of potassium crystallised out of the resulting solution, as before. This process, which is an excellent one (the loss of potassium being for the most part avoided), has been modified and improved by various authorities, as will be seen below.

4. A solution of chloride of lime (18 to 20° Baumé) is heated in a leaden or cast-iron vessel, and sufficient of a salt of potassium added to raise the density of the liquid 3 or 4 hydrometer degrees; the solution is then quickly, but carefully, concentrated until the gravity rises to 30° or 31° Baumé, when it is set aside to crystallise. A good and economical process.

5. Chloride of potassium, 76 parts, and fresh calcium hydrate, 222 parts, are reduced to a thin paste with water, q. s., and a stream of chlorine gas passed through the mixture, to saturation; chloride of calcium and chlorate of potassium are formed; the last is then removed by solution in boiling water, and is crystallised, as before. This process, which has received the approval and recommendation of Liebig, has long been practised in Germany, and was originally introduced to this country by Dr. Wagenmann. The product is very large, and of excellent quality.

Prop. White, inodorous, four- or six-sided pearly scales, soluble in about 20 parts of cold and 2½ parts of boiling water; in taste it resembles nitre, but is somewhat more austere; at about 450° Fahr. it undergoes the igneous fusion, and on increasing the heat almost to redness effervescence ensues, and fully 39% of pure oxygen gas is given off, whilst the salt becomes changed into chloride of potassium. When mixed with inflammable substances and triturated, heated, or subjected to a smart blow or strong pressure, or moistened with a strong acid, it explodes with great violence.

Pur., tests, &c. The usual impurity of this salt is chloride of potassium, arising from careless or imperfect manipulation. When this is present, a solution of nitrate of silver gives a curdy white precipitate, soluble in ammonia; whereas a solution of the pure chlorate remains clear.

Uses. Chlorate of potassium is principally used in the manufacture of lucifer matches, fireworks, oxygen gas, &c., and as an oxidising agent in calico printing. It was formerly used to fill percussion caps, but was abandoned for fulminating mercury, on account of its disposition to rust the nipples of the guns. As a medicine, it is stimulant and diuretic. It has been given in dropsy, syphilis, scurvy, cholera, typhus, and other depressing affections. It gives a fine artificial colour to the blood. (Stevens.)—*Dose.* 5 to 15 grs., in solution, twice or thrice a day.

Concluding remarks. Formerly, chlorate of potassium was a salt which was made only on the small scale, and chiefly used in experimental chemistry; now it is in considerable demand, and forms an important article of chemical manufacture. The latter has hence, of late years, received considerable attention and improvement in the leading laboratories of Europe. The chlorate requires to be handled with great care. It should never be kept in admixture with any inflammable substance, more especially with sulphur, phosphorus, or the sulphides, as these compounds are exploded by the most trivial causes, and, not unfrequently, explode spontaneously.

Potassium, Chloride of. KCl. *Syn.* CHLORIDE OF POTASSA. *Prep.* The chloride of potassium of commerce is usually a secondary product in the manufacture of chlorate of potassium and other substances. The mother-liquor of the former is evaporated to dryness and heated to dull redness, the calcined mass is then dissolved in water, the solution purified by defecation and evaporated down for crystals.

It can also be well prepared by neutralising boiling solution of carbonate of potassium by dilute hydrochloric acid, evaporating down, and crystallising.

Prop., &c. It closely resembles culinary salt in appearance; is anhydrous; dissolves in about 4 parts of cold and 2 of boiling water; has a slightly bitter, saline taste; fuses at a red heat; and is volatilised at a very high temperature. As a medicine, it is diuretic and aperient. It was formerly in high repute as a resolvent and antiscorbutic, and, particularly, as a remedy for intermittents. It is now seldom used.—*Dose.* 10 grs. to ½ dr., or more.

Potassium, Chromate of. K_2CrO_4. *Syn.* CHROMATE OF POTASSA, NEUTRAL CHROMATE OF P., MONOCHROMATE OF P., YELLOW C. OF P., SALT OF CHROME; POTASSÆ CHROMAS, P. C. FLAVA, L. This salt is only prepared on the large scale. Its source is 'CHROME ORE,' a natural octahedral chromate of iron, found in various parts of Europe and America. For medicinal purposes the commercial chromate is purified by solution in hot water, filtration, and recrystallisation.

Prep. 1. The ore, previously assayed to determine its richness, and freed as much as possible from its gangue, is ground to powder in a mill, and mixed with a quantity of coarsely powdered nitre rather less than that of the oxide of chromium which it contains; this mixture is exposed, for several hours, to a powerful heat on the hearth of a reverberatory furnace, during which time it is frequently stirred up with iron rods; the calcined mass is next raked out and lixiviated with hot water, and the resulting yellow-coloured solution evaporated briskly over a naked fire, or by the heat of high-pressure steam; chromate of potassium falls, under the form of a granular yellow salt, which is removed from time to time with a ladle, and thrown into a wooden vessel, furnished with a bottom full of holes (draining box), where it is left to drain and dry. In this state it forms the chromate of potassium of commerce. By a second solution and recrystallisation, it may be obtained in large and regular crystals. The next process has for its object the employment of a cheaper salt of potassa than the nitrate.

2. (Swindell & Co., *Patent* dated Nov., 1850.) A mixture of pulverised chrome ore and chloride of potassium is exposed to a full red heat, on the hearth of a reverberatory furnace, with occasional stirring for some time, when steam at a very elevated temperature is made to act on it, until the conversion is complete, known by assaying a portion of the mass; the chromate is then dissolved out of the residuum, as before. Common salt or hydrate of calcium may be substituted for chloride of potassium, when the chromates of sodium or calcium are respectively produced.

3. On the small scale, this salt may be prepared from the bichromate by neutralising it with hydrate of potassium.

Prop. Yellow; tastes cool, bitter, and disagreeable; soluble in 2 parts of water at 60° Fahr.; the crystals are efflorescent.

Pur. The salt of commerce is frequently contaminated with large quantities of sulphate or chlorate of potassium. To detect these, M. Zuber adds tartaric acid, dissolved in 50 parts of water, to a like solution of the sample. As soon as the decomposition is complete, and the colour verges towards the green, the supernatant liquor should afford no precipitate with solutions of the nitrates of silver and barium, whence the absence of chlorides and sulphates may be respectively inferred. The proportions are, 8 parts of tartaric acid to 1 part of the chromate. If saltpetre is the adulterating ingredient, the sample deflagrates when thrown upon burning coals.

Assay. 1. A solution of 50 grs. of the salt is treated with a solution of nitrate of barium, the precipitate digested in nitric acid, and the insoluble portion (sulphate of barium) washed, dried, and weighed. 117 grs. of this substance are equivalent to 89 grs. of sulphate of potassium.

2. The nitric solution, with the washings (*see above*), is treated with a solution of nitrate of silver, and the precipitate of chloride carefully collected, washed, dried, ignited, and weighed. 144 grs. of chloride of silver represent 76 grs. of chloride of potassium.

3. The nitric solution, with the washing (*see above*), after having any remaining barium thrown down by adding dilute sulphuric acid, in slight excess, is treated with ammonia, and the resulting precipitate of chromic oxide collected on a filter, washed, dried, carefully ignited in a silver, platinum, or porcelain crucible, and weighed. 40 grs. of this oxide represent 100 grs. of pure chromate of potassium. Any deficiency consists of impurities or adulterants.

Uses. Chromate of potassium is used in dyeing, bleaching, the manufacture of chromic acid, bichromate of potassium, &c. It is the common source of nearly all the other compounds of chromium. It is reputed alterative in doses of $\frac{1}{12}$ to $\frac{1}{2}$ gr.; and is emetic in doses of 1 to 4 grs. A solution in 8 parts of water is occasionally used to destroy fungus; 1 in 30 to 40 parts of water is also used as an antiseptic and desiccant.

Concluding remarks. The first process is undoubtedly the best, when expense is not an object. To reduce this, a mixture of 'potash' or 'pearlash,' with about $\frac{1}{2}$ of its weight of nitre, or 1-5th part of its weight of peroxide of manganese, may be substituted without much inconvenience. The assay of the chrome ore, alluded to above, may be made by reducing 100 grs. of it to powder, mixing it with twice its weight of powdered nitre, and a little hydrate of calcium, and subjecting the mixture to a strong red heat for 3 or 4 hours; the calcined mass may then be exhausted with boiling water, and the resulting solution, after precipitation with dilute sulphuric acid, in slight excess, and filtration, may be treated with rectified spirit, when its chromium may be thrown down by the addition of ammonia. (See *above*.) In the conversion of chrome ore into chromate of potassium, care should, in all cases, be taken that the proportion of nitre or alkali should be slightly less than what is absolutely required to saturate the ore, as the production of a neutral salt is thereby ensured; for should not the whole of the chromate be decomposed by the first calcination, it may easily be roasted a second time with fresh alkali, should the remaining quantity be thought worth the trouble. The nature of the furnace to be employed in the conversion is not of any great importance, so long as carbonaceous matters from the fire are entirely excluded, and the required temperature is attainable.

Potassium, Bichromate of. $K_2Cr_2O_7$, or K_2CrO_4,CrO_3. *Syn.* BICHROMATE OF POTASSA, RED CHROMATE OF POTASH, ACID C. OF P.; POTASSÆ BICHROMAS, L. *Prep.* 1. To a concentrated solution of yellow chromate of potassium, sulphuric acid, or, better, acetic acid, is added in quantity equal to one half that required for the entire decomposition of the salt; the liquid is then concentrated by evaporation, and slowly cooled, so that crystals may form.

2. (Jacquelain.) Chrome ore, finely ground and sifted, is mixed with chalk; the mixture is spread on a thin layer on the hearth of a reverberatory furnace, and heated to bright redness, with repeated stirring, for 9 or 10 hours. The yellowish-green product consists essentially of neutral chromate of calcium, mixed with ferric oxide. It is ground and stirred up with hot water, and sulphuric acid is added till a slight acid reaction becomes apparent, a sign that the neutral chromate has been converted into bichromate. Chalk is now stirred in to precipitate the ferric sulphate, and after a while the clear solution is run off into another vessel, where it is treated with carbonate of potassium, which precipitates the lime and leaves bichromate of potassium in solution. The solution is then evaporated to the crystallising-point. This process, when carried out on a large scale, is very economical.

Prop., &c. It forms very beautiful square tables, or flat four-sided prismatic crystals; permanent in the air; soluble in 10 parts of water at 60°, and in less than 3 parts at 212° Fahr.; it has a metallic, bitter taste, and is poisonous. It is chiefly *used* in dyeing and bleaching, and as a source of chromic acid. The tests, &c., are the same as for the yellow chromate.

Potassium, Citrate of. $K_3C_6H_5O_7$. *Syn.* POTASSÆ CITRAS, L. *Prep.* From a solution of citric acid neutralised with carbonate of potassium, evaporated, and granulated, or crystallised; very deliquescent. Or, extemporaneously, in the form of solution, by adding carbonate or bicarbonate of potassium to lemon juice, as in the common effervescing draught.

Potassium, Cyanate of. KCyO, or KCNO. *Prep.* 1. By roasting, at a red heat, dry ferrocyanide of potassium, in fine powder, upon an iron plate, constantly stirring it until it becomes fused into one mass, which must be reduced to fine powder, and digested in boiling alcohol, from which crystals of the cyanate will be deposited as the solution cools.

2. (Liebig.) A mixture of ferrocyanide of potassium, with half its weight of peroxide of manganese, may also be used to produce this salt, as the last; the compound should be kindled by a red-hot body, and allowed to smoulder away, after which it may be treated with alcohol, as before.

3. A mixture of ferrocyanide of potassium and litharge is heated as before, and dissolved out by alcohol, and crystallised.

Prop. Crystallisable colourless or white salt, readily soluble in alcohol and water, but readily decomposed when moist into bicarbonate of potassium and ammonia, or in solution into the carbonate of potassium and ammonium.

This salt is poisonous. The cyanates of silver, lead, and many other metals, may be made by adding a solution of cyanate of potassium to another of a neutral salt of the base.

Potassium, Cyanide of. KCN, or KCy. *Syn.* CYANIDE OF POTASH, CYANURET OF POTASSIUM; POTASSII CYANIDUM, P. CYANURETUM, L.

Prep. 1. (MEDICINAL CYANIDE OF POTASSIUM.)—*a.* A solution of pure hydrate of potassium, 2 parts, in highly rectified spirit, 7 parts, is placed in a receiver furnished with a safety tube, and surrounded with bruised ice; the beak of a tubulated retort containing ferrocyanide of potassium, in powder, 4 parts, is then adapted to it in such a manner that any gas or vapour evolved in the retort must traverse the solution in the receiver; the arrangement being complete, sulphuric acid, 3 parts, diluted with an equal weight of water, and allowed to cool, is cautiously poured into the retort, and the distillation conducted very slowly, a very gentle heat only being applied, as circumstances may direct; as soon as the force of ebullition in the retort has subsided, the distillation is complete, and the connection between the retort and receiver is broken; the contents of the receiver, now transformed into a mixture of a crystalline precipitate of cyanide of potassium, and an alcoholic solution of undecomposed hydrate of potassium, is carefully thrown on a filter, and the precipitate, after the mother-liquor has drained off, very cautiously washed with ice-cold and highly rectified spirit, and then drained, pressed, and dried on the same filter. The product is chemically pure, and equal to fully 10% of the ferrocyanide employed. This is a modification of what is commonly known as 'Wigger's process.'

b. Expose well-dried and powdered ferrocyanide of potassium to a moderate red heat, in a close vessel; when cold, powder the fused mass, place it in a funnel, moisten it with a little alcohol, and wash it with cold water; evaporate the solution thus formed to dryness, expose it to a dull red heat in a porcelain dish, cool, powder, and digest it in boiling rectified spirit; as the spirit cools, crystals of cyanide of potassium, nearly pure, will be deposited. The alcohol employed in both this and the preceding process may be recovered by distillation from calcined sulphate of iron.

2. (CRUDE OR COMMERCIAL CYANIDE—Liebig.) Commercial ferrocyanide of potassium, 8 parts, rendered anhydrous by gently heating it on an iron plate, is intimately mixed with dry carbonate of potassium, 3 parts; this mixture is thrown into a red-hot earthen crucible, and kept in a state of fusion, with occasional stirring, until gas ceases to be evolved, and the fluid portion of the mass becomes colourless; the crucible is then left at rest for a few minutes, to allow its contents to settle, after which the clear portion is poured from the heavy black sediment at the bottom, upon a clean marble slab, and the mass, whilst yet warm, broken up, and placed in well-closed bottles.

Obs. A cheap and excellent process. The product is said to contain about 1-8th part of cyanate of potassium, and, though not sufficiently pure for employment in medicine as potassium cyanide, is admirably adapted for the various technical applications of this substance, as in electro-plating, electro-gilding, photography, &c. It may also be advantageously substituted for the ferrocyanide in the preparation of hydrocyanic acid by the distillation of that substance along with dilute sulphuric acid.

Prop., &c. When pure, this salt is colourless and odourless; it forms cubic or octahedral crystals, which are anhydrous; it is freely soluble in water and in boiling alcohol, but most of it separates from the latter as the solution cools; it is fusible; and undergoes no change, even at a full red heat, in close vessels; it exhibits an alkaline reaction; when exposed to the atmosphere, it absorbs moisture, and acquires the smell of hydrocyanic acid. If it effervesces with acids, it contains carbonate of potassium, and if it be yellow it contains iron. It is employed in chemical analyses, and for the preparation of hydrocyanic acid; cyanide of sodium may be made in the same way. The *dose* is $\frac{1}{12}$ to $\frac{1}{4}$ gr., in solution; in the usual cases in which the administration of hydrocyanic acid is indicated.

Potassium, Ferricyanide of. K_3FeCy_6, or K_3, FeC_6N_6. *Syn.* FERRIDCYANIDE OF POTASSIUM, FERRICYANURET OF P., RED PRUSSIATE OF POTASH; POTASSII FERRICYANIDUM, P. PRUSSIAS RUBRUM, L. This important and beautiful salt was discovered by L. Gmelin. At first it was merely regarded as a chemical curiosity, but it is now extensively employed in dyeing, calico-printing, assaying, &c.

Prep. 1. Chlorine gas, prepared in the ordinary manner, is slowly passed into a cold solution of ferrocyanide of potassium, 1 part, in water, 10 parts, with constant agitation, until the liquid appears of a deep reddish-green colour, or of a fine red colour by transmitted light, and ceases to give a blue precipitate, or even a blue tinge, to a solution of ferric chloride, an excess of chlorine being carefully avoided; the liquor is next evaporated by the heat of steam or boiling water, until a pellicle forms upon the surface, when it is filtered, and set aside to cool; the crystals are afterwards purified by re-solution and re-crystallisation.—Another method is simply to evaporate the original solution to dryness, by a steam-heat, with agitation, then to redissolve the residuum in the least possible quantity of boiling water, and, after defecation or filtration, to allow the new solution to cool very slowly, that crystals may form.

2. (Extemporaneous.) Add nitric acid, very gradually, to a cold solution of ferrocyanide of potassium, with constant agitation, until a drop

of the mixture ceases to impart a blue colour to a solution of ferric chloride, carefully avoiding excess of acid. It may be at once used in solution, or evaporated, &c., as before.

Prop., *&c.* Magnificent regular prismatic or, sometimes, tabular crystals, of a rich ruby-red tint; permanent in the air; combustible; decomposed by a high temperature; soluble in 4 parts of cold water; insoluble in alcohol. Colours ferric salts a pale brown, gives with ferrous salt a deep blue, and precipitates bismuth salts pale yellow; cadmium and mercuric salts, yellow; zinc salts, deep yellow; mercurous, cupric, molybdenic, silver, and uranic salts, reddish brown; cobalt salts, dark brown; manganous salts, brown; cupric salts, greenish; and nickelous salts, olive brown.

Potassium, Ferrocyanide of. K_4FeCy_6, or $K_4FeC_6N_6$. *Syn.* FERROCYANURET OF POTASSIUM, PRUSSIATE OF POTASH, YELLOW P. OF P.; POTASSÆ PRUSSIA FLAVA (B. P.), POTASSII FERROCYANIDUM (Ph. L. E. & D.), L. This valuable salt, the well-known 'prussiate of potash' of commerce, was discovered by the illustrious Scheele about the middle of the 18th century. It is now only manufactured on the large scale.

Prep. Good 'potash' or 'pearlash,' 2 parts, and dried blood, horns, hoofs, woollen rags, or other refuse animal matter, 5 or 6 parts, are reduced to coarse powder, and mixed with some coarse iron borings; the mixture is then injected into egg-shaped cast-iron pots in a state of moderate ignition; the mass is frequently stirred with an iron spatula, so as to prevent it running together, and the calcination is continued until fetid vapours cease to be evolved, and flame is no longer seen on stirring the mixture, care being taken to exclude the air from the vessels as much as possible; during the latter part of the process the pots are kept constantly covered, and the ignited mass stirred less frequently; the hot pasty mass is then removed with an iron ladle, and excluded from the air until cold; it is next exhausted by edulcoration with boiling water, and the resulting solution, after defecation or filtration, is concentrated by evaporation, so that crystals may form as the liquid cools; these are redissolved in hot water, and the solution allowed to cool very slowly, when large and beautiful yellow crystals of ferrocyanide of potassium are deposited.—*Product.* 1 ton of dried blood or woollen refuse, with 3 cwt. of pearlash, yields from 2 to 2½ cwt. of commercial ferrocyanide. The mother-liquor contains sulphate of potassium.

Prop. It forms large and very beautiful yellow crystals, which are permanent in the air, and very tough and difficult to powder; it is soluble in 4 parts of cold and 2 parts of boiling water; has a mild saline taste; at a gentle heat loses water; at a higher temperature, in closed vessels, it is, for the most part, converted into cyanide of potassium, and, when exposed to the air, into cyanate of potassium. Precipitates solutions of antimonous, bismuth, mercurous, and zinc salts, white; cadmium salts, of a pale yellow; cuprous salts, white, turning red; ferrous salts, white, turning blue; lead salts, white; manganous salts, white, turning red; mercuric salts, white, turning bluish; nickelous salts, white, turning green; silver salts, white; stannous salts, white; cobalt salts, green; cupric salts, chocolate red; ferric salts, dark blue; palladous salts, green; stannic salts, yellow; uranic salts, reddish brown; and zinc salts, white.

Uses, *&c.* Ferrocyanide of potassium is chiefly used in dyeing and calico-printing, in the manufacture of Prussian blue, in electro-plating, and, in chemistry, as a test, and a source of hydrocyanic acid. As a medicine, it is said to be sedative and astringent, and in large doses purgative, but appears to possess little action. —*Dose.* 10 grs. to ½ dr., dissolved in water; in hooping-cough, chronic bronchitis, night-sweats, leucorrhœa, &c. D'Arcet swallowed a solution containing ½ oz. of this salt without experiencing any injurious effects.

Potassium, Hydrate of. KHO. *Syn.* POTASSA HYDRATE, HYDRATE OF POTASSA, POTASSA, CAUSTIC P., HYDRATED OXIDE OF POTASSIUM; POTASSA CAUSTICA (B. P.), POTASSA (Ph. E.), P. CAUSTICA (Ph. D.), P. HYDRAS (Ph. L.), P. FUSA. *Prep.* 1. (Ph. L.) Liquor of potassa, 1 gall.; evaporate the water in a clean iron vessel over the fire until, the ebullition being finished, the residuum of potassium hydrate liquefies; pour this into proper moulds.

2. (Ph. E. & D.) As the last, but pouring the fused hydrate upon a bright and clean iron plate (silver or iron dish—Ph. D.); as soon as it solidifies, break it quickly (into fragments), and put it into stoppered glass (green-glass—Ph. D.) bottles.

3. (Pure.) The hydrate, obtained as above, is dissolved in alcohol or rectified spirit, and after repose for a few days in a closely stopped green-glass or silver vessel, the solution is decanted, and cautiously evaporated in a deep silver basin, out of contact with the air.

Prop., *&c.* When perfectly pure, it is white, solid, very soluble in water and in alcohol; very deliquescent; intensely acrid and corrosive; and exhibiting the usual signs of alkalinity in the highest degree. That of the shops has usually a grayish or bluish colour.

Potassium, I'odate of. KIO_3. *Syn.* POTASSÆ IODAS, L. *Prep.* Neutralise a hot solution of hydrate of potassium with iodine, evaporate to dryness by a gentle heat, powder the residuum, and digest it in alcohol, to remove iodide of potassium, dissolve the insoluble portion in hot water, and crystallise.

Obs. Iodate of potassium is resolved at a red heat into oxygen gas and iodide of potassium. It has been recommended in bronchocele.—*Dose.* 1 to 5 grs.

Potassium, Iodide of. KI. *Syn.* POTASSII IODIDUM (B. P., Ph. L. E. and D.). 1. (Ph. L. 1836.) Take of iron filings, 2 oz.; distilled water, 2 quarts; iodine, 6 oz.; mix them, and heat the solution until it turns green, and then add of carbonate of potassium, 4 oz., dissolved in water, 1 quart; filter, wash the residuum on the filter with water, evaporate the mixed filtered liquors and cystallise. Product, 1 oz. of iodine yields 1 oz. 45 grs. of iodide.

The formulæ of the Ph. D. and Ph. E. are very similar.

2. Add iodine to a hot solution of pure hydrate of potassium, until the alkali is perfectly neutralised, carefully avoiding excess, evaporate the liquid to dryness, and expose the dry mass to a gentle red heat in a platinum or iron crucible; afterwards, dissolve out the salt, gently evaporate, and crystallise. An excellent process, yielding a large product, but, if the ignition be not carefully managed, it is apt to contain a little undecomposed iodate. To obviate this, Mr. Scanlan proposes the addition of a little powdered charcoal to the mass before ignition, a plan adopted in the Ph. U.S.

3. Iodine is treated with a small proportion of phosphorus in water, and is thus converted into 'hydriodic acid;' hydrate of calcium is then added, and the 'iodide of calcium' formed is first fused, and then decomposed by sulphate of potassium into 'sulphate of calcium,' which is precipitated, and 'iodide of potassium,' which remains in solution, and may be crystallised, as in the other processes. This is a modification of a method devised by Liebeg.

Prop. It crystallises in cubes, which in the pure salt are extremely white, though frequently opaque; these are anhydrous; fuse when heated, without decomposition; dissolve in less than an equal weight of water, at 60° Fahr., and very freely in alcohol; and do not deliquesce in moderately dry air, unless they contain undecomposed hydrate of potassium. Its solution dissolves the iodine freely, and also, less readily, several of the insoluble metallic iodides and oxides.

Pur. It is entirely soluble in both water and alcohol. Its aqueous solution alters the colour of turmeric either not at all or but very slightly, nor does it affect litmus paper, or effervesce with acids. Nitric acid and starch being added together, it becomes blue. It is not coloured by the addition of tartaric acid with starch. No precipitate occurs on adding either a solution of hydrate of calcium or of chloride of barium. 100 grs., dissolved in water, by the addition of nitrate of silver, yield a precipitate of 141 grs. of iodide of silver.

Assay. The iodide of commerce frequently contains fully one half its weight of either chloride or carbonate of potassium, or both of them, with variable quantities of iodate of potassium, a much less valuable salt. The presence of these substances is readily detected by the above tests. As the first of these is only very slightly soluble in cold alcohol, and the others insoluble in that liquid, a ready method of determining the richness of a sample in pure iodide, sufficiently accurate for ordinary purposes, is as follows:—Reduce 50 grs. of the sample to fine powder, introduce this into a test tube with 6 fl. drs. of alcohol, agitate the mixture violently for one minute, and throw the whole on a weighed filter set in a covered funnel, observing to wash what remains on the filter with another fl. dr. of alcohol. The filtrate, evaporated to dryness, gives the quantity of pure iodide, and the filter, dried by the heat of boiling water, that of the impurities present in the sample examined, provided it contained no hydrate of potassium. The quantity of alkali, whether hydrate or carbonate, may be found by the common method of 'alkalimetry.'

Uses, &c. Chiefly in medicine and pharmacy.—*Dose.* 1 to 10 grs., twice or thrice daily, made into pills, or, better, in solution, either alone or combined with iodine; in bronchocele, scrofula, chronic rheumatism, dropsy, syphilis, glandular indurations, and various other glandular diseases. Also externally, made into a lotion or ointment.

Potassium, Nitrate of. KNO_3. *Syn.* NITRATE OF POTASH, NITRE, SALTPETRE; POTASSÆ NITRAS (B. P., Ph. L. E. & D.), NITRUM†, SAL NITRI†, SAL PETRÆ†, KALI NITRATUM†, L. This salt is produced naturally in the soil, by the action of the atmosphere, and crystallises upon its surface, in various parts of the world, especially in the East Indies. On the Continent it has long been produced artificially, by exposing a mixture of calcareous soil and animal matter to the atmosphere, when calcium nitrate is slowly formed, and is extracted by lixiviation. The liquid is then decomposed by the addition of wood ashes, or carbonate of potassium, by which carbonate of calcium is precipitated, and nitrate of potassium remains in solution. The places where these operations are performed are called 'nitriaries,' or 'nitrières artificielles.' The British market is wholly supplied from India. The salt of the first crystallisation, by either process, is called 'crude nitre' or 'rough saltpetre.' This is purified by solution in boiling water, skimming, and, after a short time allowed for defecation, straining (while still hot) into wooden crystallising vessels. The crystals thus obtained are called 'single refined nitre;' and when the process is repeated 'double refined nitre.'

1. (POTASSÆ NITRAS PURUM.—Ph. D.) Commercial nitre, 4 lbs.; boiling distilled water, 1 quart; dissolve, withdraw the heat, and stir the solution constantly as it cools; the minute crystals, thus obtained, are to be drained, and washed, in a glass or earthenware percolator, with cold distilled water, until that which trickles through ceases to give a precipitate with a solution of nitrate of silver, the contents

of the percolator are then to be withdrawn, and dried in an oven.

Prop. White, pellucid, six-sided prisms; permanent in the air; soluble in 7 parts of water at 60° and in 1 part at 212° Fahr.; insoluble in alcohol; its taste is cool, saline, and slightly bitter and pungent; at about 560° it fuses to an oily-looking mass, which concretes on cooling, forming 'sal prunella;' at a red heat it gives out oxygen, and, afterwards, nitrous fumes; sp. gr. 1·925 to 1·975.

Pur. Commercial nitre generally contains chlorides, sulphates, or calcareous salts. The first may be detected by its solution giving a cloudy white precipitate with nitrate of silver. The second by chlorides of barium or calcium giving a white precipitate, and the third by oxalate of ammonium giving a white precipitate.

Assay. Of the numerous methods prescribed for this purpose, few are sufficiently simple for mere practical men. The proportion of chlorides, sulphates, and calcareous salts, may be determined as above; and the general richness of the sample by the method of Gay-Lussac, modified as follows:—100 grs. of the sample (fairly chosen) are triturated with 50 grs. of lampblack and 400 grs. of common salt, and the mixture placed in an iron ladle, and ignited or fused therein, due care being taken to prevent loss; the residuum is exhausted with hot water, and the solution thus obtained tested by the usual methods of alkalimetry for carbonate of potassium. The quantity of carbonate found, multiplied by 2·125 or 2⅛, gives the per-centage richness of the sample in nitrate.

Uses, &c. Nitre is chiefly employed in the manufacture of gunpowder, fireworks, and nitric acid. It is also used in medicine as a sedative, refrigerant, and diaphoretic, and as a cooling diuretic. It has been recommended in active hæmorrhages (especially spitting of blood), in various febrile affections, in scurvy, and in herpetic eruptions; and it has been highly extolled, by Dr. Basham, as a remedy in acute rheumatism.—*Dose.* 5 to 15 grs., every 2 hours. A small piece, dissolved slowly in the mouth, frequently stops a sore throat at the commencement. In large doses, it is poisonous. The best treatment is a powerful emetic, followed by opiates.

Potassium, Nitrite of. KNO_2. *Syn.* NITRITE OF POTASSA; POTASSÆ NITRIS, L. *Prep.* 1. By heating nitre to redness, dissolving the fused mass in a little water, and adding twice the volume of the solution in alcohol; after a few hours the upper stratum of liquid is decanted, and the lower one, separated from the crystals, evaporated to dryness.

2. (Corenwinder.) Nitric acid, 10 parts, are poured on starch, 1 part, and the evolved gas passed through a solution of hydrate of potassium of the sp. gr. 1·380, to saturation; the liquid is then either neutralised with a little hydrate of potassium (if necessary), and kept in the liquid form, or at once evaporated. Fused pinkish mass, or clear colourless soluble crystals, used in chemistry as a reagent, and deoxydiser.

Potassium, Oxalate of. $K_2C_2O_4$. *Syn.* NEUTRAL OXALATE OF POTASSA; POTASSÆ OXALAS, L. *Prep.* Neutralise a solution of oxalic acid, or the acid oxalates, with carbonate of potassium, evaporate, and crystallise. Transparent colourless rhombic prisms, soluble in 3 parts of water, and of the formula $K_2C_2O_4$, Aq.

Potassium, Hydrogen Oxalate of. K,H,C_2O_4. *Syn.* POTASSIUM BINOXALATE, SALT OF SORREL, ESSENTIAL SALT OF LEMONS; POTASSÆ BINOXALAS, L. *Prep.* By saturating a solution of oxalic acid, 1 part, with carbonate of potassium, adding to the mixture a similar solution of 1 part of oxalic acid, unneutralised, and evaporating for crystals. It may also be obtained from the expressed juice of wood or sheep's sorrel, by clarifying it with eggs or milk, and evaporating, &c., as before. Colourless rhombic crystals of the formula KHC_2O_4, Aq, soluble in 40 parts of cold and 6 parts of boiling water, yielding a very sour solution.

Potassium, Trihydrogen Oxalate of. $KH_3(C_2O_4)$, or KHC_2O_4, $H_2C_2O_4$. *Syn.* POTASSIUM QUADROXALATE, POTASSIUM ACID OXALATE. *Prep.* By neutralising 1 part of oxalic acid with carbonate of potassium, adding to the solution 3 parts more of oxalic acid, evaporating and crystallising. Resembles the last; has the formula $KH_3(C_3O_4)_2$, 2Aq; but is less soluble, and more intensely sour, and forms modified octahedral crystals. This salt is occasionally sold under the names of 'sal acetosellæ,' 'salt of sorrel,' and 'essential salt of lemons.' Both are used to remove ink and iron stains from linen, to bleach the straw used for making bonnets, and, occasionally, in medicine, as a refrigerant.

Potassium, Oxide of. K_2O. *Prep.* Burn pure potassium in a current of oxygen. White powder, rapidly absorbing water and forming the hydrate.

Potassium, Perchlorate of. $KClO_4$. *Syn.* POTASSÆ PERCHLORAS, L. Prepared by projecting well-dried and finely powdered chlorate of potassium, in small portions at a time, into warm nitric acid. The salt is separated from the 'nitrate' by crystallisation.

Potassium, Prus'siate of. See POTASSIUM FERRICYANIDE and FERROCYANIDE.

Potassium, Salicylite of. Formed by mixing salicylous acid (artificial oil of meadow-sweet) with a strong solution of hydrate of potassium; it separates, on agitation, as a yellow crystalline mass, which, after pressure in bibulous paper, is recrystallised from alcohol. Golden-yellow crystals, soluble in both water and alcohol; damp air gradually converts them into acetate of potassium and melanic acid.

Potassium, Sulphate of. K_2SO_4. *Syn.* POTASSÆ SULPHAS (B. P., Ph. L. E. & D.). *Prep.* The sulphate of potassium of commerce is a secondary product of several chemical and manufacturing processes. Thus, the residuum of the distillation of nitric acid from nitre is dissolved in water, the solution neutralised with carbonate of potassium, and, after defecation, evaporation until a pellicle forms; it is then strained, or decanted, and set aside to crystallise. Or, the residuum is simply ignited, to expel excess of acid, and then dissolved, and crystallised, as before.

Prop., &c. Anhydrous, heavy, quartz-like crystals; permanent in the air; soluble in 12 parts of water at 60° and in 5 parts at 212° Fahr.; insoluble in alcohol; extremely nauseous, and bitter-tasted. It crepitates on the application of heat; fuses at a red heat, but loses nothing in weight. 100 grs., dissolved in distilled water, on the addition of chloride of barium and hydrochloric acid, furnish 132 grs. of sulphate of barium, dried at a red heat.

Potassium, Bisulphate of. $KHSO_4$. *Syn.* POTASSIUM-HYDROGEN SULPHATE, ACID POTASSIUM SULPHATE; POTASSÆ BISULPHAS. *Prep.* 1. (Anhydrous.) Neutral sulphate of potassium and oil of vitriol, equal parts; hot water, q. s. (not more) to dissolve; anhydrous bisulphate crystallises out, in long delicate needles, as the solution cools. If these are left for several days in the mother-liquor, they are redissolved, and crystals of the ordinary hydrated bisulphate are deposited.

2. (Hydrated.)—*a.* (Ph. L. 1836.) Salt left in distilling nitric acid, 2 lbs.; boiling water, 3 quarts; dissolve; add of sulphuric acid, 1 lb.; concentrate by evaporation, and set the liquid aside, so that crystals may form.

b. (Ph. D.) Sulphate of potassium (in powder), 3 oz.; sulphuric acid, 1 fl. oz.; mix them in a porcelain capsule, and expose it to a heat capable of liquefying its contents, until acid vapours cease to be evolved; powder the residuum, and preserve it in a well-stopped bottle.

Prop., &c. Sour and slightly bitter-tasted rhombic prisms; soluble in about 2 parts of cold and 1 part of boiling water, the solution exhibiting a strongly acid reaction. It is much employed, in lieu of tartaric acid, for the production of carbonic acid, in 'gazogenes,' &c.; also to adulterate cream of tartar and tartaric acid. According to Dr. Paris, it forms a "grateful adjunct to rhubarb."—*Dose.* 12 grs. to 1½ dr., in solution, combined with rhubarb or bitters, as the neutral sulphate.

Potassium, Sulphocyanide of. KCNS, or KCyS. *Syn.* SULPHO-CYANURET OF POTASSIUM; POTASSII SULPHOCYANIDUM, P. SULPHO-CYANURETUM, L. *Prep.* 1. Ferrocyanide of potassium (anhydrous, or dried by a gentle heat), 46 parts; sulphur, 32 parts; pure carbonate of potassium, 17 parts; reduce them to powder, and very gradually heat the mixture to low redness in a covered iron crucible, which it will less than one half fill; remove the half-refrigerated and still soft mass, crush it, exhaust it with water, and evaporate the aqueous solution to dryness; powder the residuum, and exhaust it with hot alcohol or rectified spirit; the alcoholic solution will yield beautiful white crystals as it cools, and the residuum or mother-liquor may be evaporated for the remainder of the salt.

2. Cyanide of potassium, 3 parts; sulphur, 1 part; water, 6 parts; digest them together for some time, add 3 parts more of water, filter, evaporate, and crystallise.

Prop., &c. Long, slender, colourless prisms or plates, which are anhydrous, bitter-tasted, deliquescent, fusible, very soluble in both water and alcohol, and non-poisonous. It is chiefly used as a test for ferric oxide, for which purpose it is preferable to all other substances.

Potassium, Sulphide of. *Syn.* SULPHURET OF POTASSIUM, LIVER OF SULPHUR†; POTASSII SULPHURETUM (Ph. L. E. & U.S.), HEPAR SULPHURIS (Ph. D.), L. *Prep.* 1. (Ph. E.) Sulphur, 1 oz.; carbonate of potassium, 4 oz.; mix, heat them in a covered crucible till they form a uniform fused mass; when cold, break it into fragments, and preserve it in well-closed vessels. The formulæ of the Ph. L. 1836 and Ph. U.S. are similar.

2. (Ph. D.) Sublimed sulphur, 4 oz.; carbonate of potassium (from pearlash, first dried, and then reduced to powder), 7 oz.; mix in a warm mortar, heat them in a Hessian crucible, as before, pour the fused mass into an iron cup, over which immediately invert a second vessel, to exclude the air, and, when cold, break the mass into fragments, and preserve it in a green-glass stoppered bottle.

Prop., &c. A hard, brittle, liver or greenish-brown coloured solid; inodorous whilst dry; soluble in water, forming a highly fetid solution; and, in acids, evolving strong fumes of sulphuretted hydrogen; reaction, alkaline; exposed to the air, it is gradually converted into sulphate of potassa. As a medicine, it is reputed diaphoretic, expectorant, and stimulant.—*Dose.* 2 to 6 grs., in solution, or made into pills with soap; in gout, rheumatism, liver affections, and various chronic skin diseases. Externally, made into a lotion and ointment. It is highly acrid and corrosive, and in large doses poisonous.

Potassium, Tartrate of. $K_2C_4H_4O_6$. *Syn.* NEUTRAL TARTRATE OF POTASSIUM, TARTRATE OF POTASSA, NEUTRAL TARTAR, SOLUBLE T.; POTASSÆ TARTRAS (B. P., Ph. L. E. & D.), KALI TARTARIZATUM†, L. *Prep.* (Ph. D.) Carbonate of potassium, 8 oz.; distilled water, 2 quarts; dissolve, and to the solution, whilst boiling hot, gradually add of bitartrate of potassium, in fine powder, 1 lb., or q. s., so that the liquid, after ebullition for a couple of minutes, ceases to change the colour of either blue or reddened litmus paper; next filter the liquid through calico, evaporate it until a pellicle forms on the surface, and set it aside to crystallise; after 12 hours, collect the crystals, dry them on bibulous paper, and preserve them from the air. The formula of the Ph. L. 1836 is nearly similar.

Prop., &c. The crystals of this salt, which are obtained with difficulty, are right rhombic prisms, and are deliquescent. The salt of commerce is usually in the form of a white granular powder, which is obtained by simply evaporating the solution to dryness, with constant stirring. In this state it requires about 4 parts of cold water for its solution. Acids convert it into the bitartrate. As a medicine, it acts as a gentle diuretic and aperient, and is valued for correcting the griping properties of senna and resinous purgatives. It is also antiscorbutic.—*Dose.* ½ dr. to ½ oz., in powder, or dissolved in water. The solution changes the colour neither of litmus nor turmeric. The addition of almost any acid throws down crystals of bitartrate of potassium, which generally adhere to the vessel. The precipitate occasioned by either chloride of barium or acetate of lead is dissolved by dilute nitric acid.

Potassium, Bitartrate of. $KHC_4H_4O_6$. *Syn.* ACID TARTRATE OF POTASSA, SUPER-TARTRATE OF P., CREAM OF TARTAR; CREMOR TARTARI, POTASSÆ BITARTRAS (B. P., Ph. L. E. & D.), POTASSÆ SUPER-TARTRAS, TARTARI CRYSTALLI, L. This well-known salt is deposited during the fermentation of grape juice, as a crust on the sides of the casks or vats. In its unprepared or crude state, it is called white or red tartar or argol, according to the wine from which it has been obtained. It is purified by boiling it in water, crystallisation, resolution in water, and treatment with freshly burnt charcoal and aluminous clay, to remove the colour; the clear liquid is then decanted, whilst still hot, and allowed to cool slowly; the resulting crystals form the 'cream of tartar' of commerce.

Prop., &c. Small, translucent, gritty, prismatic crystals, irregularly grouped together; permanent in the air; requiring fully 100 parts of cold water, and about 15 parts of boiling water, for their perfect solution; the solution has a harsh, sour taste, and, like that of the tartrate, suffers spontaneous decomposition by keeping. Its solution reddens litmus. At a red heat, it is converted into carbonate of potassium. Entirely soluble in 40 parts of boiling water; 40 grs., in solution, are neutralised by 30 grs. of crystallised carbonate of soda.—*Dose.* As an aperient, 1 to 3 drs.; as a diuretic, ½ dr. to 1 dr.; as an antiscorbutic, 10 to 20 grs., frequently. It is much used to make a pleasant cooling drink ('Imperial'), and in tooth-powders.

POTA'TO. This well-known and valuable article of food is the tuber of the *Solanum tuberosum* or *esculentum*, a plant which was introduced to this country by either Sir Francis Drake or Sir Walter Raleigh, towards the latter part of the 16th century. It is now extensively cultivated in all the temperate climates of the world. It yields a vast quantity of food on a small space of ground, but only about 1-7th part of the weight of the tuber is nutritious, and this is chiefly farinaceous. Its farina or starch is, however, accompanied by no inconsiderable portion of saline matter, more especially of potassa, which renders it highly antiscorbutic, and a powerful corrective of the grossness of animal food. When forming part of a mixed diet, perhaps no substance is more wholesome than the potato, and, certainly, no other esculent hitherto discovered appears equally adapted for universal use.

No certain rule can be laid down for 'dressing' potatoes. "If boiled, it may be that they require to be put into boiling water, or, may be, into cold, and either boiled quickly or slowly; but this you must find out. Choose them all about the same size, with a smooth skin, and when they are boiled and begin to crack, throw off the water immediately, as it only damages the root. When dressed, let them stand near the fire, with a cloth over them, and serve them in the skins. Salt may be put into the water at the beginning. A watery potato will require quick boiling, and, sometimes, to be put into boiling water." (Soyer.)

To retain the highest amount of nourishment in potatoes, they should be 'dressed' with their skins on them. The bruised or damaged parts, worm-holes, &c., being removed with a knife, the dirt should be carefully cleaned out of the "eyes," and from the rough parts of the skins, by means of a brush and water, after which they should be well rinsed in clean water, and drained in a colander. If they are at all dry or shrivelled, they may be advantageously left to soak for 3 or 4 hours in clean cold water before cooking them. Potatoes 'dressed' in the skins have been found to be nearly twice as rich in potassa-salts as those which have been first peeled. The skins are easily removed before sending them to table.

NEW POTATOES should have their loose outer skin rubbed off with a cloth or stiff brush before being dressed or cooked.

MASHED POTATOES are prepared by crushing, with the back of a spoon, or with a rolling-pin, the hot 'dressed' tubers, placed in a bowl or dish, or on a pie-board. A little milk, butter, and salt, may be added to them at will; and they may be either at once 'served up,' or pressed into 'forms,' and first 'browned off' in the oven. Potatoes, if not soft and mealy, and well masticated, frequently escape the solvent action of the stomach, and pass off undigested, often to the serious derangement of the health. By mashing them, this inconvenience is removed. The delicate, the dyspeptic, and the aged, should take them in no other form.

Potatoes may be preserved, so as to stand the longest voyages unchanged, by thoroughly desiccating them in an oven, or by steam heat. For this purpose, the roots, either raw or three parts dressed, are generally first cut into dice of above ¾ inch square, to facilitate the operation. Under a patent granted to Mr. Downes Edwards, Aug., 1840, the boiled potatoes are mashed and granulated, by forcing them through a perforated plate, before drying them. The granulated product, beaten up with a little hot milk or hot water, forms an excellent extemporaneous dish of mashed potatoes.

POT POURRI. [Fr.] A mixture of odorous flowers, roots, gums, &c., varied according to the taste of the operator, either mixed together dry, or in the fresh state preserved with salt. "The usual way of making it is to collect roses, lavender, and other sweet-scented flowers, as they blow; to put them into a large jar mixed (stratified) with salt, until a sufficient quantity has been collected; then to add to these such other odorous substances as may be required to form an agreeable perfume." Among the substances thus added are—ambergris, benzoin, calamus root, cascarilla, cassia, cassia buds, cinnamon, civet, cloves, musk, musk seed, orange berries and flowers, orris root, pimento, storax, vanilla, yellow sandal wood, &c.

"Instead of the fresh flowers, dried roses are sometimes used, and, with the addition of some essential oils, these answer quite as well." (Redwood.)

POT'TED MEATS. See Putrefaction and Potting (*below*).

POT'TERY. The mechanical operations connected with the manufacture of pottery (ceramic art) do not come within the province of this work. The materials employed, in this country, to produce the best kind of earthenware (Staffordshire ware) are the fine white clays of Devonshire and Cornwall, and powdered chert or flint. This is brought to a perfectly homogeneous plastic mass with water, and in this state is fashioned upon the potter's wheel and lathe, or by moulding, into all the varied objects of utility and ornament which are made in this material. After the newly formed vessels and other articles have been dried by exposure in heated rooms, they are enclosed in clay cases (seggars) and exposed to heat in a kiln, by which they arrive at a state (biscuit) which renders them fit for glazing; the patterns (if any) and, afterwards, appropriate vitreous materials having been applied to their surfaces, they are again placed in the seggars, and are again exposed in a kiln to a heat sufficiently high to fuse the newly applied compound, by which they acquire a uniform enamelled surface, and become fit for the market. Porcelain, or China, as it is commonly called, is manufactured in a nearly similar manner, but the materials are selected and the various processes conducted with corresponding skill and care.

The ornamental patterns are produced upon both Staffordshire ware and porcelain by a number of ingenious processes, among which printing, painting, and moulding, are the principal. The colours employed are those which have been already referred to under Enamels.

The metallic lustres now so common on stoneware, &c., are given as follows:—

1. Gold lustre. Dissolve grain-gold, 1 dr., in aqua regia, ¾ oz.; to the solution add of metallic tin, 6 grs.; and when this is dissolved, pour it very gradually, with constant stirring, into a mixture of balsam of sulphur, ½ dr.; oil of turpentine, 20 grs.; when the mass begins to stiffen, ½ dr. more of oil of turpentine must be added, and well mixed in. More gold deepens and brightens the lustre; more tin turns it on the violet or purple.

2. Iron lustre. From a mixture of 'muriate of iron' (ferric chloride) and spirit of tar.

3. Platinum lustre. To a solution of platinum in aqua regia (platinic chloride) is added, drop by drop, a mixture of spirit of tar and balsam of sulphur in equal proportions, until by a trial the composition is found to give the required result. This gives the appearance of polished steel.

4. Silver lustre. The ammonio-chloride of platinum is reduced to an impalpable powder, ground up to the requisite consistence with a little spirit of tar, and at once applied with a brush.

The above lustres are applied, over an easily fusible glaze, to the outer surfaces only of the vessels, after which adhesion is produced by exposing the pieces to a slight degree of heat in the muffle. To give them their full beauty, they must be rubbed with cotton, wool, or chamois leather, after the firing. See Alumina, Clay, Enamels, Gilding, Glazes, Kaolin, &c.

POT'TING. A term commonly applied to the operation or practice of preserving animal substances in a state fit for immediate use, in small pots or jars. The method of proceeding is, first, to mince the substance (previously well dressed, and carefully deprived of bones, sinews, skin, &c.), and, next, to pound it in a clean polished marble or iron mortar, along with a little butter and some cayenne pepper, or other suitable spice or sauce, until it forms a perfectly smooth paste; this is pressed into the pots, so as to about 2-3rds fill them, and clarified melted butter is then poured in to the depth of about 1-8th of an inch; the pots are, lastly, closely covered over, and kept in a cool situation. In this state their contents may be preserved for a year, or longer. Potted beef, ham, veal, poultry, game, anchovies, bloaters, salmon, &c., are commonly sold in the shops. They are all intended for relishes, and are spread upon bread, in the same manner as butter.

POUDRE KOUSIQUE. [Fr.] A French nostrum, consisting of nitre and sulphur, of each, 50 parts; charcoal and antimony, of each, 1 part. It is divided into ½-dr. doses, of which

[illegible]

[illegible] preparation is the nauseous taste [illegible] which is ill concealed by the [illegible]. The 'HIERA PICRA' for farriers [illegible] made with the cheapest Cape aloes.

Powder of Alum (Compound). Syn. Styptic powder. Pulvis stypticus, P. aluminis compositus (Ph. E.), L. Prep. (Ph. E.) Alum, 4 oz.; kino, 1 oz.; mix them, and reduce them to fine powder. Astringent and styptic.—Dose. 5 to 15 grs.; in diarrhœa, profuse menstruation, &c. Externally, in hæmorrhages, &c.

Powder of Anchovy. Syn. Pulvis clupeæ [illegible], L. Prep. Pound anchovies to [illegible], rub them through a sieve, and add enough flour to make a dough, which must be rolled out into thin slices and dried by a gentle heat in a stove; it is, lastly, powdered and bottled. Colouring is frequently added. Chiefly used to make sauces. British anchovies are frequently substituted for the [illegible].

Powder, Antimonial. Syn. Fever powder, [illegible] James's p.; Pulvis Jacobi, Pulvis antimonialis (B. P., Ph. E. & D.), Pulvis antimonii compositus (Ph. L.), L. Prep. 1. (Ph. L.) A mixture of tersulphide of antimony, 1 lb., and hartshorn shavings, 2 lbs., is reduced to powder, thrown into a crucible heated to whiteness, and stirred constantly until vapour no longer rises; the [illegible] mixture is then rubbed to powder, again put into the crucible, and the heat gradually increased to whiteness, and maintained so for 2 hours; the residuum is, lastly, reduced to a very fine powder.

2. (Ph. E.) From sulphide of antimony and hartshorn shavings, equal weights; as the last.

3. (Ph. D.) Levigated antimony, 4 oz., is dissolved in water, ½ gall., and added to a solution of phosphate of soda, 4 oz., in water, 1 quart; a solution of chloride of calcium, 3 oz., in water 1 quart, and to which solution of ammonia (Ph. D.), 4 fl. oz., has been added, is then poured in, and the whole boiled for 20 minutes; the precipitate is then collected on a calico filter, and washed with hot distilled water until the liquid which passes ceases to give a precipitate with a weak solution of nitrate of silver; it is, lastly, dried by a steam or water heat, and reduced to a fine powder.

4. (B. P.) Oxide of antimony, 1; precipitated phosphate of lime, 2; mix.—*Dose.* 2 to 6 grs.

Obs., &c. Febrifuge and diaphoretic. Intended as a substitute for the proprietary and more expensive JAMES'S P **Dose.** 3
to 10 or 12 grs., or mo
fourth or fifth hour until d
in fevers, rheumatic affec
diseases, &c. It is a very u
the compound, unless it has b
pared. Dr. Elliotson exhibit
100 grs., without producing a

A spurious article, made by triturating 1 oz. of tartar emetic with 18 or 19 oz. of burnt hartshorn, is frequently sold for it in the shops. See ANTIMONIOUS ACID and JAMES'S POWDER.

Powder, Aromat'ic. See COMPOUND CINNAMON POWDER.

Powder, Arsen'ical. See ESCHAROTIC POWDER.

Powder of Asarabac'ca (Compound). See SNUFF (Cephalic).

Powder, Astrin'gent. *Syn.* PULVIS ASTRINGENS, P. STYPTICUS, L. *Prep.* From Aleppo galls and burnt alum, in fine powder, equal parts. *Used* in piles, soft polypi of the nose, chilblains, &c.

Powder, Ba''king. *Prep.* 1. Tartaric acid, ½ lb.; bicarbonate of soda and potato farina or British arrow-root, of each, ¾ lb. (each in powder); separately dry them perfectly by a very gentle heat, then mix them in a dry room, pass the mixture through a sieve, and at once put it into packets, observing to press it hard, and to cover it with tinfoil or close-made paper, to preserve it as much as possible from the air and moisture.

2. (Delforte's.) Powdered tartaric acid, ¼ lb.; powdered alum, ½ lb.; bicarbonate of soda, ¾ lb.; farina, 1 lb.; dry separately, as before, mix, and further add of sesquicarbonate of ammonia (in powder), 3 oz.; lastly, closely pack it in tinfoil.

3. (Green's.) Tartaric acid, 35 lbs.; sesquicarbonate of soda, 56 lbs.; potato flour, 1 cwt.; mix as before.

Uses, &c. Baking powder is chiefly employed as a substitute for yeast. 1 or 2 teaspoonfuls are mixed with the dry flour and other ingredients, which are then made into a dough, as quickly as possible, with cold water, and at once baked or boiled, as the case may be. By the addition of about ½ dr. of turmeric powder to each pound of the mixture it is converted into egg powder. When intended to be kept for any length of time it should be preserved in bottles or tins, so as to prevent the absorption of moisture. We have discovered traces of arsenic in some of the baking powders of the shops, which we refer to common washerwoman's soda being used in their composition, instead of the pure carbonate or sesquicarbonate.

Powder, Basil'ic. *Syn.* ROYAL POWDER, CORNACHINI'S P.; PULVIS BASILICUS, P. CORNACHINI, L. *Prep.* From scammony, calomel, cream of tartar, and diaphoretic antimony, equal parts. This is the formula generally adopted for this compound, which has now long been omitted from the Pharmacopœias. It is still a favourite with many practitioners, as an alterative purgative, and vermifuge for children.—*Dose.* For a child, 2 to 8 grs.; for an adult, 5 to 20 grs. Compound powder of scammony is now generally sold for it.

Powder, Blaine's Distem'per. The basis of this preparation is the 'aurum musivum,' or bisulphuret of tin. (Dr. Paris.)

Powder, Blancmange'. *Prep.* From sago meal, 1 lb.; essence of lemon, 15 drops; mace, 12 grs.; mix.

Powder, Bleach'ing. Chloride or hypochlorite of lime.

Powder Blue. See SMALT.

Powder, Bronze. See TIN (Bisulphide), BRONZING, &c.

Powder of Burnt Hartshorn. *Syn.* PULVIS CORNU CERVINI USTI, L. *Prep.* From pieces of hartshorn calcined to whiteness, and powdered. It consists principally of phosphate of lime.—*Dose.* 10 to 30 grs.; in rickets, &c.

Powder of Burnt Hartshorn with O'pium. *Syn.* PULVIS OPIATUS, PULVIS CORNU USTI CUM OPIO, L. *Prep.* From powdered calcined hartshorn, 1 oz.; powdered opium and cochineal, of each, 1 dr.—*Dose.* 5 to 20 grs.

Powder, Capuchin'. *Prep.* From powdered cevadilla, parsley seed, stavesacre, and tobacco, equal parts. *Used* to destroy pediculi.

Powder, Castillon's. *Prep.* From sago meal, salep, and gum tragacanth, of each 3 drs.; prepared oyster shells, 1 dr.; cochineal, q. s. to colour. Absorbent.—*Dose.* ½ to 1 dr., boiled in milk; in diarrhœa, &c.

Powder of Cat'echu (Compound). *Syn.* PULVIS CATECHU COMPOSITUS (B. P., Ph. D.), L. *Prep.* 1. (Ph. D.) Take catechu and kino, of each, 2 oz.; cinnamon and nutmeg, of each, ½ oz.; reduce each to a fine powder, mix, and keep the prepared powder in a well-stopped bottle. Aromatic and astringent.—*Dose.* ½ dr. to 2 drs.; in various affections.

2. (B. P.) Pale catechu; kino, 2; rhatany, 2; cinnamon, 1; nutmeg, 1; mix.—*Dose.* 15 to 30 grs.

Powder of Chalk (Compound). *Syn.* PULVIS CRETÆ AROMATICUS (B. P.), PULVIS CRETÆ COMPOSITUS (Ph. L. E. & D.), P. CARBONATIS CALCIS COMP., L. *Prep.* 1. (Ph. L.) Prepared chalk, ½ lb.; cinnamon, 4 oz.; tormentil and gum acacia, of each, 3 oz.; long pepper, ½ oz.; rub them, separately, to a very fine powder, and mix them.

2. (Ph. E.) Prepared chalk, 4 oz.; cinnamon, in fine powder, 1½ dr.; nutmeg, in fine powder, 1 dr.

3. (Ph. D.) Prepared chalk, 5 oz.; cinnamon, 2½ oz.; gum, 2 oz.; nutmeg, ½ oz.

4. (AROMATIC POWDER OF CHALK, B. P.) Chalk, 11; cinnamon, 4; nutmeg, 3; saffron, 3; cloves, 1½; cardamom seed, 1; refined sugar, 25; all in powder; mix.—*Dose.* 30 to 60 grs.

Uses. &c. Aromatic, astringent, and antacid.—*Dose.* 10 to 30 grs.; in acidity, flatulence, heartburn, diarrhœa, &c. The following form is used by many wholesale houses:—Prepared chalk, 4 lbs.; powdered cassia, 2 lbs.; powdered calamus aromaticus, ¾ lb.; powdered gum, 1½ lb.; long pepper, ¼ lb.

Powder of Chalk with Opium (Compound). *Syn.* PULVIS CRETÆ AROMATICUS CUM OPIO

(B. P.); OPIATED CHALK POWDER; PULVIS CRETÆ COMPOSITUS CUM OPIO (Ph. L.), PULVIS CRETÆ OPIATUS (Ph. E. & D.), L. *Prep.* 1. (Ph. L.) Compound chalk powder, 6½ oz.; powdered opium, 80 grs.

2. (Ph. E.) Compound chalk powder, 6 oz.; powered opium, 80 grs.

3. (Ph. D.) Compound chalk powder, 4 oz. 7 drs.; opium, in fine powder, 1 dr.

4. (Wholesale.) Compound chalk powder, 21 oz.; powered opium, ¼ oz. Anodyne, antacid, and carminative.—*Dose.* 10 to 30 grs.; in the same cases as the preceding, than which it is more active. It has long been a favourite remedy in all cases of simple and even cholernic diarrhœa.

5. Aromatic powder of chalk (*see* POWDER OF CHALK (Compound), 4), 39; opium, in powder, 1; mix thoroughly, and pass through a sieve.—*Dose.* 10 to 40 grs.

Powder, Chalk Mixture. *Syn.* PULVIS PRO MISTURA CRETÆ, L. *Prep.* (Beasley.) Powdered gum acacia, 5 oz.; prepared chalk, 4 oz.; white sugar, 3 oz.; oil of cinnamon, 1½ fl. dr.; mix. 40 grs. of this powder, triturated with 1 fl. oz. of water.

Powder, Chol′era (Saline). *Syn.* PULVIS SALINUS ANTICHOLERRICUS, L. *Prep.* 1. (Dr. O'Shaughnessy.) Carbonate of soda, 5 grs.; chloride of sodium, phosphate of soda, and sulphate of soda, of each, 10 grs. For a dose.

Powder of Cin′namon (Compound). *Syn.* AROMATIC POWDER; PULVIS CINNAMOMI COMPOSITUS (B. P., Ph. L.), PULVIS AROMATICUS (Ph. E.), L. *Prep.* 1. (Ph. L.) Cinnamon, 2 oz.; cardamoms, 1½ oz.; ginger, 1 oz.; long pepper, ½ oz.; rub them together so that a fine powder may be made.

2. (B. P., Ph. E.) Cinnamon, cardamom seeds, and ginger, equal parts; to be kept in a well-closed glass vessel.

3. (Ph. D.) Cinnamon and ginger, of each, 2 oz.; cardamom seeds (husked), and nutmegs, of each, 1 oz. Aromatic and carminative.—*Dose.* 10 to 30 grs. In the powder of the shops cassia is generally substituted for cinnamon.

Powder, Cla′rifying. Flake albumen. See ALBUMEN.

Powder, Cock′le. From the well-known shell-fish *Cardium edule* (Linn.), as oyster powder.

Powder, Colbatche's Specific. *Prep.* From solution of sesquichloride of iron and acetate of lead, of each, 4 oz.; mix, evaporate to dryness, powder the residuum, and preserve it from the air. Astringent and hæmostatic.—*Dose.* 3 to 8 grs.

Powder of Col′ocynth. *Syn.* PULVIS COLOCYNTHIDIS, L. That of the shops is generally prepared from the whole of the peeled fruit, with the seeds, instead of merely from the pulp, by which its activity is greatly lessened. A factitious article is also met with in trade, made by grinding byrony root with about twice its weight of colocynth seeds, and a very small quantity of gamboge.

Powder of Contrayer′va (Compound). *Syn.* PULVIS CONTRAYERVÆ COMPOSITUS, L. *Prep.* (Ph. L. 1824.) Powdered contrayerva root, 5 oz.; prepared oyster shells, 1½ lb.; mix. A tonic absorbent or antacid.—*Dose.* 10 grs. to ½ dr., as required.

Powder, Corn.—See CORN SOLVENT (*page* 371), and WART POWDER (*below*).

Powder, Cosmet′ic. *Syn.* PULVIS COSMETICUS, L. *Prep.* (Ph. Hann. 1831.) Blanched sweet almonds and beans, of each, 18 oz.; orris root, 8 oz.; white Spanish soap, 6 oz.; spermaceti, 1½ oz.; dried carbonate of soda, 1 oz.; oils of lavender, bergamot, and lemon, of each, 6 drs.; mix, and beat them to a powder. See HAIR and HAND POWDER (*below*), PASTE (Almond), POWDERS (Scented), &c.

Powder of Cryst′al. From quartz, like POWDERED GLASS (page 574). *Used* to make fine glass; also for a dryer for paints, and sold under the name of 'diamond dust' for razor strops.

Powder, Cur′ry. *Syn.* INDIAN CURRY POWDER. The samples of this compound prepared by different houses vary so greatly from each other in the proportions of the ingredients, that it is difficult to regard any one as a standard. The following are therefore merely given as examples:—

Prep. 1. Corianders, 1 lb.; turmeric, ¾ lb.; black pepper, ½ lb.; scorched mustard, ¼ lb.; ginger, 2 oz.; cumin seed, 1 oz.; capsicums, ¾ oz.; mace, ¼ oz.; (all in powder;) mix well.

2. Coriander seeds and black pepper, of each, 8 lbs.; turmeric and cumin seeds, of each, 4 lbs.; allspice, ¾ lb.; mace, 1 oz.; (all in powder;) mix. This receipt is employed by an eminent wholesale house that does very largely in curry powder.

3. (See *page* 381.)

Used as a condiment and flavouring ingredient. The addition of a few heads of garlic gives it an increased zest for Indian veterans.

Powder, Cust′ard. *Prep.* From sago meal, 2 lbs.; powdered turmeric, ½ oz.; bitter-almond powder, cassia, and mace, of each, ½ dr.

Powder, Cyprus. From *Cladonia rangiferina*, or reindeer moss. It has a very agreeable smell, and, being extremely retentive of odours, is much used as a basis for scent-powders, sachets, &c. The lichen known as the ragged hoary evernia also possesses nearly similar properties, and is often substituted for it. See POWDERS (Scented).

Powder, Disinfect′ing. *Syn.* PULVIS DISINFECTANS, L. *Prep.* (Keist.) Bisulphate of potassa, 41 parts; sugar of lead, 7 parts; binoxide of manganese, 3 parts; reduce them separately to a fine powder, and, when wanted for use, mix a proper quantity in any suitable vessel. For other formulæ, see DISINFECTING COMPOUNDS. The name is generally applied to hypochlorite of lime.

Powder, Dover's. *Syn.* PULVIS DOVERI, L. *Prep.* (Original formula.) Nitre and sulphate of potassa, of each, 4 oz.; melt them together in a red-hot crucible, reduce the cold fused matter to powder, and add powdered ipecacuanha, liquorice, and opium, of each, 1 oz. This is the formula adopted in the Paris Codex. COMPOUND IPECACUANHA POWDER is now sold under this name. (See *below*.)

Powder, Egg. See BAKING POWDER.

Powder, Emmen'agogue. *Syn.* PULVIS EMMENAGOGUS, P. HÆMATINUS, P. CONTRA AMENORRHŒAM, L. *Prep.* 1. Saccharine carbonate of iron, 3 parts; powdered myrrh, ginger, and nutmeg, of each, 1 part; divide into ½-dr. papers. One for a *dose*, twice or thrice daily.

2. (Augustin.) Myrrh, 12 grs.; saffron, 3 grs.; oil of cloves, 1 drop. For a *dose*, as the last.

3. (Klein.) Calomel, 4 grs.; extract of yew, 10 grs.; powdered savine, 1 dr.; Quevenne's iron, ½ dr.; loaf sugar, 2 drs. For 6 powders; as before.

Powder, Escharot'ic (Arsenical). *Syn.* PULVIS ESCHAROTICUS ARSENICALIS, L.; POUDRE DU FRÈRES COSME, Fr. *Prep.* 1. (Original formula.) From white arsenic, 12 grs.; burnt hartshorn, ½ dr.; cinnabar, 1 dr.

2. (P. Cod.) Red sulphuret of mercury and powdered dragon's blood, of each, 2 parts; levigated arsenious acid, 1 part; carefully mixed together. See ARSENICAL CAUSTIC (*page* 304).

Powder of Extract of Col'ocyth (Compound). *Syn.* PULVIS EXTRACTI COLOCYNTHIDIS COMPOSITI, L. *Prep.* From compound extract of colocynth (Ph. L. 1836), dried by a gentle heat, and powdered.

Obs. This, like many other articles employed by lazy dispensers, does not represent the preparation for which it is used as a substitute; whilst, from its peculiar character, it is very open to sophistication, a practice, we regret to say, very general with certain druggists. Indeed, some of these parties make this article by simply throwing the ingredients of the extract into a pan along with a little water, and, when they have become soft, stirring them together with a spatula, after which they are desiccated and powdered. This is then labelled by certain houses "Pulv. Ext. Coloc. co.—P. L.," and sold to their unfortunate customers as such, although no such an extract has been in the Ph. L. since that of 1836.

Powder, Faynard's. The charcoal of beechwood, finely powdered. (Paris.) *Used* in piles, and as a styptic.

Powder, Fe'ver. See ANTIMONIAL POWDER (*above*).

Powder of Flint. *Syn.* SILEX CONTRITUS (Ph. L.), L. *Prep.* As powdered glass. (See *page* 574.) It is ordered in the Ph. L. to be employed, instead of magnesia, for the purpose of mechanically dividing the essential oils used in the preparation of distilled water. It is also used as an escharotic.

Powder, Fly. *Prep.* From white arsenic, 5 oz.; white sugar, 6 lbs.; rose pink, 2 oz.; mix, and put 6 drs. in each paper. *Used* to kill flies. It is poisonous, and should be employed with great caution, particularly where there are children.

Powder, Ful'minating.

Powder, Fu''migating. *Syn.* PULVIS FUMALIS, L. *Prep.* (Ph. Russ.) Amber, mastic, and olibanum, of each, 3 parts; storax, 2 parts; benzoin and labdanum, of each, 1 part; reduce them to coarse powder, and mix them well. See FUMIGATION.

Powder, Galls of (Compound). *Syn.* PULVIS GALLÆ COMPOSITUS, L. See ASTRINGENT POWDER.

Powder, Goelis's Antihec'tic. *Prep.* From burnt hartshorn, powdered nutmeg, black pepper, and roasted laurel berries, of each, 1 part; liquorice powder, 3 parts.—*Dose.* ½ to 1 dr.; in the hectic fever of scrofulous subjects.

Powder, Goulard. Effloresced sugar of lead. Poisonous.

Powder, Gray. Mercurial powder.

Powder, Gregory's. See COMPOUND RHUBARB POWDER (*below*).

Powder, Hæmostat'ic. *Syn.* PULVIS HÆMOSTATICUS, L. *Prep.* 1. (Guibourt.) Charcoal and gum arabic, of each, in powder, 1 part; powdered resin, 4 parts.

2. (Mialhe.) From powdered alum, gum tragacanth, and tannin, equal parts. *Used* to check local bleeding.

Powder, Hair. *Syn.* PULVIS PRO CRINE, L. Starch reduced to a very fine powder, and then scented according to the fancy of the artist; it is, lastly, passed through a gauze sieve. In its simple form, without any addition, its constitutes 'plain hair powder.' In other cases it is distinguished by the name of the substance added to perfume it. Thus, we have 'rose hair powder,' 'violet h. p.,' &c. Potato farina, well triturated, is now commonly used for hair powder. Amongst the lower classes, the contents of the 'flour dredger' of the kitchen are frequently misappropriated to this purpose. See SCENTED POWDERS (*below*.)

Powder, Hand. *Prep.* From almond powder, 1 lb.; powdered cuttle-fish bone and white soap, of each, 4 oz.; orris powder, 1 oz.; mix. *Used* to clean the hands, and to render them soft and white. See COSMETIC POWDER.

Powder, Helvetius's. *Syn.* PULVIS HELVETII, L. A mixture of powdered alum and dragon's blood. (Dr. Paris.)

Powder, Herrenschwand's Specific. See PATENT MEDICINES.

Powder, Hiera Picra. Powder of aloes with canella (see *above*).

Powder, Hufeland's. *Syn.* HUFELAND'S

QUINQUINA FACTICE, PULVIS CINCHONÆ FACTITIUS, P. SALICIS COMPOSITUS, L. *Prep.* From bennet (the herb), calamus aromaticus, chestnut bark, gentian root, and willow bark, equal parts; reduced to powder.

Powder, Hunter's. See WART POWDER (*below*).

Powder, Hunt's Breakfast. See *page* 260.

Powder of Ipecacuan'ha (Compound). *Syn.* DOVER'S POWDER, COMPOUND POWDER OF IPECACUANHA WITH OPIUM; PULVIS DOVERI, PULVIS IPECACUANHÆ COMPOSITUS (B. P., Ph. L. E. & D.), L.; POUDRE D'IPECACUANHA ET D'OPIUM, Fr. *Prep.* 1. B. P., Ph. L.) Ipecacuanha and opium, of each, in fine powder, 1 dr.; sulphate of potassa, in fine powder, 1 oz.; mix them (thoroughly). The Edin. and Dublin Formulæ are similar.

2. (P. Cod.) Nitre and sulphate of potassa, of each, 4 oz.; ipecacuanha, liquorice root, and hard extract of opium, of each, 1 oz. This closely resembles the original formula.

3. (Wholesale.) From powdered ipecacuanha and opium, of each, 1 lb.; powdered sulphate of potassa, 8 lbs. *Uses, &c.* 'Dover's powder' is a powerful and valuable sudorific.—*Dose.* 5 to 15 or 20 grs., followed by warm diluents; in inflammatory affections, rheumatisms, colds, &c.

Powder, Itch. *Syn.* PULVIS ANTIPSORICUS, L. *Prep.* 1. Sulphur and potato farina, of each, ½ lb.; essence of bergamot, ¼ oz.; mix.

2. (Poudre de Pihorel.) A mixture of finely pulverised sulphuret of calcium and farina, in nearly equal quantities. *Used* either as a dusting powder or mixed with a little oil or fat, and rubbed into the affected part.

Powder of Jal'ap (Compound). *Syn.* PULVIS JALAPÆ COMPOSITUS (B. P., Ph. L. E. & D.), L. *Prep.* 1. (Ph. L.) Jalap, 3 oz.; bitartrate of potassa, 6 oz.; ginger, 2 drs.; rub them separately into fine powder, then mix them.

2. (Ph. E.) As the last, omitting the ginger.

3. (Ph. D.) Jalap, 2 oz.; bitartrate of potassa, 3½ oz.; ginger, ½ oz.; (all in fine powder;) mix by careful trituration.—*Dose.* 20 to 60 grs.; as a purgative in habitual costiveness, dropsies, &c.; also in worms, the tumid bellies of children, &c.

4. (B. P.) Jalap, in powder, 5; acid tartrate of potash, 9; ginger, in powder, 1; mix. —*Dose.* 20 to 60 grs.

5. (PULVIS LENITIVUS; SACRE ORANGÉ PURGATIF.) From refined sugar, ¾ lb.; jalap and cream of tartar, of each, 2 oz.; oil of orange peel, ¼ oz. A popular purgative on the Continent.—*Dose.* 1 to 3 drs.

Powder, James's. *Syn.* PULVIS JACOBI, P. FEBRIFUGUS JACOBI, L. The antimonial powder, or compound powder of antimony, of the *Pharmacopœias* (see *above*) is the preparation which usually passes under this name; but the true James's powder is a nostrum the pretended secret of the preparation of which is claimed to be possessed by only two parties in the kingdom. The patent specification of the once celebrated Dr. James runs as follows:—

"Take of antimony, calcine it with a continued protracted heat, in a flat, unglazed earthen vessel, adding to it, from time to time, a sufficient quantity of any animal oil and salt, well dephlegmated; then boil it in melted nitre for a considerable time, and separate the powder from the nitre by dissolving it in water." On this it has been remarked that it yields a product totally different from that which Dr. James and his successors have sold under the name, and he has hence been charged with concealing the real formula for his powder, and publishing a false one in its stead.

According to Dr. Robinson, the original formula for this nostrum, and that still adopted by the vendors of the proprietary article at the present day, is—Tartarised antimony, 1 part; prepared burnt hartshorn and calx of antimony, of each, 5 parts; carefully mixed together, and divided into 21-gr. powders. ('Phil. Journ. Pharm.,' vi, 282.)

From analyses recently made of three specimens of James's powder ('Newberry's,' 'Butler's,' and a sample of 60 years old obtained by Mr. Squire), it appears that antimonious acid was present in different proportions, from about 45% to 33%, the amount being greatest in the old specimen; teroxide of antimony was also present to the extent of from 9% to less than 1%, the greatest quantity being again in the old preparation; the remainder in each specimen consisted chiefly of phosphate of lime; no trace of tartaric acid was discoverable in any of the samples.

Perhaps no nostrum ever received such extensive patronage from the faculty as James's powder. Dr. James himself was remarkably successful in its use; but whether his success depended upon his powder or the mercurials and bark which he commonly employed at the same time, is still undetermined.

Powder of Ki'no (Compound). *Syn.* PULVIS KINO COMPOSITUS (B. P., Ph. L.), L. *Prep.* (B. P., Ph. L.) Kino, 15 drs.; cinnamon, 4 drs.; dried opium, 1 dr.; reduce them separately to fine powder, and then mix them.—*Dose.* 5 to 20 grs.; in diarrhœa, pyrosis, &c.

Powder, Lausanne. *Prep.* From nitre, 1½ dr.; carbonate of magnesia, bitartrate of potassa, precipitated sulphur, and oleo-saccharum of peppermint, of each, 4 drs.; sugar of milk, 1 oz. Lenitive and antidysenteric.

Powder, Lax'ative. See SPECIES.

Powder of Liq'uorice (Compound). *Syn.* PULVIS GLYCYRRHIZÆ COMPOSITUS, L. *Prep.* (Ph. Bor.) Liquorice root and senna leaves, of each, 6 oz.; fennel seed and milk of sulphur (pure), of each, 3 oz.; white sugar, 18 oz.; (all in fine powder;) mix. Pectoral and laxative.

Powder of Magne'sia and Rhu'barb. See COMPOUND RHUBARB POWDER (*below*).

Powder, Martin's Can'cer. An American nostrum, composed of the powdered stems of the *Orobanche Virginiana* (Linn.), combined with a very small quantity of arsenious acid. It is used as a sprinkle for open cancers and cancerous sores.

Powder, Mercu″rial. *Syn.* GREY POWDER (HYDRARGYRUM CUM CRETÂ, B. P.), MERCURY WITH CHALK. *Prep.* 1. (B. P.) Mercury, 1; prepared chalk, 2; triturate till the globules disappear.—*Dose.* 3 to 8 grs.

2. Mercury, 3 oz.; powdered resin, ¾ oz.; prepared chalk, 5 oz.; rectified spirit, q. s.; make a paste with the resin and a small quantity of the spirit; add the mercury, which may be extinguished in a short time; then the chalk and alcohol, gradually, so as to keep up the pasty consistence; lastly, add sufficient spirit to dissolve out the resin, wash the powder on a filter, and dry it. Rectified oil of turpentine may be substituted for the spirit.

Powder, Milk. (See *page* 914.)

Powder, Morison's Ape″rient. See PATENT MEDICINES.

Powder of Mush'room. *Syn.* PULVIS AGARICI, P. A. ESCULENTI, L. From edible mushrooms, dried by a gentle heat, and then powdered along with a little white pepper, cloves, and mace. Some cayenne is frequently added.

Powder of Mus'sel. From the *Mytilus edulis* (Linn.), or common mussel, in the same way as OYSTER POWDER.

Powder of Myrrh (Compound). *Syn.* PULVIS È MYRRHÂ COMPOSITUS, L. *Prep.* (Ph. L. 1788.) Myrrh, dried savine, dried rue, and Russian castor, equal parts, rubbed to powder, and then well mixed. Emmenagogue and antispasmodic.—*Dose.* 12 to 30 grs.

Powder, Nur'sery. See VIOLET POWDER (*below*).

Powder, O″piated. Powder of chalk with opium.

Powder of Oys'ter. *Syn.* PULVIS OSTREÆ, L. *Prep.* From the common oyster (*Ostrea edulis*—Linn.), pulped through a sieve, made into a paste with wheaten flour and a little salt, and then rolled out into thin pieces and dried; these are reduced to powder, sifted, and packed in well-corked bottles. *Used* to make sauce; about 1 oz., to water, 1 pint. Other shell-fish are treated in the same way.

Powder, Pea. *Syn.* PEA FLOUR; FARINA PISORUM, L. *Prep.* From peas, in the usual manner. *Used* to make extemporaneous pea-soup.

Powder, Pearl. *Prep.* From pure pearl white and French chalk (scraped fine by Dutch rushes), equal parts; triturated together. Some makers add more French chalk. *Used* as a skin cosmetic. This mixture is preferable to pearl white alone, from being more adhesive.

Powder, Pease. *Prep.* From dried mint and sage, of each, 4 oz.; celery seed and white pepper, of each, ½ oz.; turmeric powder, ¼ oz.; reduced to fine powder. *Used* as a condiment and kitchen spice.

Powder, Pec'toral. See POWDER OF LIQUORICE, &c.

Powder, Piles. *Syn.* PULVIS ANTI-HÆMORRHOIDALIS, P. HÆMORRHOIDALIS, L. *Prep.* 1. (Fr. Hosp.) Precipitated sulphur, 3 oz.; cream of tartar and black pepper, of each, 1 oz.; oil of cubebs, ½ dr.—*Dose.* A teaspoonful, in milk or honey, thrice a day.

2. (External.)—*a.* From Aleppo galls, in very fine powder, 2 oz.; opium, in fine powder, 1 dr. A pinch to be applied occasionally.

b. From sesquioxide of iron, 1 oz.; powdered acetate of lead, ½ dr. As the last.

Powder, Plate. *Syn.* PULVIS PRO ARGENTO, L. *Prep.* 1. Jeweller's rouge, ¼ lb.; prepared chalk or levigated burnt hartshorn, ¾ lb.; mix.

2. Levigated putty powder, ¼ lb.; burnt hartshorn, ½ lb.; prepared chalk, 1 lb.; rose pink, 1 oz.

3. (MERCURIAL.) From quicksilver with chalk, 1 oz.; prepared chalk, 11 oz.; mix. *Used* to clean and polish plate. See PLATE.

Powder, Plate Boiling. *Prep.* From cream of tartar, common salt and alum, equal parts. A little of this powder, added to the water in which plate is boiled, gives to it a silvery whiteness.

Powder, Plummer's Al'terative. See ANTIMONIAL ETHIOPS.

Powder, Poul'tice. *Syn.* PULVIS PRO CATAPLASMATE (Ph. D. 1826), L. *Prep.* From linseed meal, 1 part; oatmeal, 2 parts; mixed together.

Powder, Rat. See RATS.

Powder of Rhu'barb (Compound). *Syn.* GREGORY'S MIXTURE, GREGORY'S POWDER; PULVIS RHEI COMPOSITUS (B. P., Ph. E. & D.), L. *Prep.* 1. (Ph. E.) Calcined magnesia. 1 lb.; rhubarb, 4 oz.; ginger 2 oz.; (all in fine powder;) mix, and preserve it from the air.

2. (B. P., Ph. D.) Calcined magnesia, 6 oz.; rhubarb, 2 oz.; ginger, 1 oz.

3. Calcined magnesia, 8 oz.; rhubarb, 3 oz.; chamomile, 2 oz.; ginger, 1 oz.

Obs. An excellent stomachic, antacid, and laxative.—*Dose.* 20 grs. to ½ dr. Some druggists substitute the heavy carbonate for the calcined magnesia ordered above, but this alters the nature of the preparation, and requires the dose to be increased. Heavy calcined magnesia may, however, be employed with advantage.

Powder, Sach'et. See SCENTED POWDERS.

Powder, Saline' (Compound). *Syn.* PULVIS SALINUS COMPOSITUS (Ph. E.), L. *Prep.* (Ph. E.) Pure chloride of sodium and sulphate of magnesia, of each, 4 oz.; sulphate of potash, 3 oz.; each separately dried by a gentle heat, and pulverised, then triturated together, and preserved in well-closed vessels. An excellent saline purgative.—*Dose.* 2 to 6 drs., in ½ pint of water or table-beer, in the morning, fasting.

Powder of Scam'mony (Compound). *Syn.* PULVIS SCAMMONII COMPOSITUS (B. P., Ph. L. E. & D.), L. *Prep.* 1. (Ph. L.) Scammony and hard extract of jalap, of each, 2 oz.; ginger, ½ oz.; rub them separately to a very fine powder, and then mix them.—*Dose.* 5 to 15 grs.

2. (Ph. E.) Scammony and bitartrate of potassa, of each, in very fine powder, equal parts.—*Dose.* 7 to 20 grs.

3. (Ph. D.) Scammony, in fine powder, 1 oz.; compound powder of jalap, 3 oz.; mix. —*Dose.* 10 to 30 grs.

4. (B. P.) Scammony, 4; jalap, 3; ginger, 1; mix, and reduce to fine powder.—*Dose.* 10 to 20 grs.

Obs. The above are favourite cathartics in worms, especially for children. They are commonly sold for basilic powder. (See *above.*)

Powder of Scammony with Cal'omel. *Syn.* PULVIS SCAMMONII CUM CALOMELANE, L. *Prep.* From scammony, ½ oz.; calomel and white sugar, of each, 2 drs. An excellent vermifuge for children.—*Dose.* For an adult, 5 to 20 grs.; for a child, 2 to 8 grs. Sold for basilic powder, to which it approaches nearer in composition than the preceding.

Powder, Schmidt's Parturifa"cient. *Syn.* SCHMIDT'S POUDRE OCYTIQUE, Fr. *Prep.* From powdered ergot of rye, borax, and oleosaccharum of camomile, of each, 8 grs.; powdered sugar, q. s. For a *dose;* to be repeated every quarter of an hour, until some effect is produced.

Powder of Sen'na (Compound). *Syn.* PULVIS SENNÆ COMPOSITUS, L. *Prep.* (Ph. L. 1824.) Senna and bitartrate of potassa, of each, 2 oz.; scammony, ½ oz.; ginger, 2 drs.; all in fine powder; mix.—*Dose.* 20 to 30 grs., or more; as a purgative or anthelmintic.

Powder of Senna (Battley's Green). *Syn.* PULVIS SENNÆ VIRIDIS, L. *Prep.* From senna leaves, dried and heated until they turn yellow, then powdered along with a little (blue) charcoal, to give a green colour.

Powder, Sil'vering. *Prep.* 1. Silver dust (fine), 20 grs.; alum, 30 grs.; common salt, 1 dr.; cream of tartar, 3 drs.; rub them together to a fine powder.

2. As the last, but substituting 35 grs. of nitrate of silver for the silver dust.

3. Chloride of silver is dissolved in a solution of hyposulphite of soda, and the solution made into a paste with levigated burnt hartshorn or bone dust; this is next dried, and powdered.

4. Silver dust, 1 oz.; common salt and sal ammoniac, of each, 4 oz.; corrosive sublimate, ¼ oz.

Obs. The above powders, made into a paste with a little water, are *used* to silver dial-plates, statuettes, and other articles in copper, previously well cleaned, by friction. The best silver powder for the purpose is that precipitated from its nitric solution by means of a copper plate. When the product of the last formula is used, the articles should be afterwards made red hot, and polished.

Powder of Soap. *Syn.* SAPO CONTRITUS, PULVIS SAPONIS, L. Castile soap, sliced or cut small, dried by exposure to a warm atmosphere, or by a very gentle heat, and then powdered. *Used* in dispensing; also as a hand, shaving, and tooth powder. As a cosmetic, it may be scented at will.

Powder of Sponge. *Syn.* PULVIS SPONGIÆ, P. SPONGIÆ USTÆ, L. *Prep.* Let sponge, cut into small pieces, be beaten so as to free it from sand or stones; then burn it in a covered iron vessel, until it becomes black and friable; finally, reduce it to powder. Deobstruent. —*Dose.* ½ to 3 drs.; in glandular indurations and enlargements, &c. It should be of a brownish-black colour; if over burnt, its efficacy is destroyed.

Powder of Squills. *Syn.* PULVIS SCILLÆ, L. *Prep.* Remove the membranous integuments from the bulb of the squill, cut it into thin slices, and dry it at a heat between 90 and 100° Fahr.; next reduce it to powder, and keep it in well-stopped bottles.

Powder, Sternuta'tory. See SNUFFS (Medicated).

Powder, Styp'tic. See ASTRINGENT POWDER, FAYNARD'S P., &c.

Powder of Trag'acanth (Compound). *Syn.* PULVIS TRAGACANTHÆ COMPOSITUS (B. P., Ph. L. & E.), L. *Prep.* 1. (Ph. L.) Gum tragacanth, gum acacia, and starch, of each, in fine powder, 1½ oz.; powdered white sugar, 3 oz. The Edinburgh formula is similar. Demulcent.—*Dose.* ½ dr. to 2 drs., in water or any simple liquid; in hoarseness and catarrhs, combined with squills and henbane, to allay irritation; in dysentery, combined with ipecacuanha; in gonorrhœa, strangury, &c., combined with acetate of potass or nitre.

2. (B. P.) Tragacanth, in powder, 1; gum arabic, in powder, 1; starch, in powder, 1; refined sugar, in powder, 3; rub well together. —*Dose.* 10 to 60 grs.

Powder, Violet. *Syn.* NURSERY POWDER, SKIN P. This is simply starch reduced to a very fine powder, and scented with orris powder or essence of violets. The best kinds are also perfumed with a little musk or ambergris, and are now generally made with potato farina. The commoner sort is only scented with a little essence of bergamot or essence of lemon. 'Plain violet powder' is, of course, unscented.

Prep. 1. Powdered starch, 28 lbs.; powdered orris root, 1 lb.; essence of ambergris and essence of bergamot, of each, ½ oz.; oil of rhodium, ½ dr.; mix, and pass the powder through a sieve.

2. Powdered starch, 14 lbs.; essence of bergamot, ½ oz.; oil of cloves, ¼ oz.; as last. *Used* as a dusting powder in excoriations, &c. See COSMETIC POWDERS (*below*).

Powder, Ward's Sweating. Resembles DOVER'S POWDER.

Powder, Wart. *Syn.* CORN POWDER, COS-

METIC CAUSTIC, &c. *Prep.* 1. Ivy leaves ground to powder. A pinch is applied with a rag, the part being first moistened with strong vinegar. *Useful* for soft corns and warts.

2. (Hunter's.) From savine and verdigris, equal parts. See CORN SOLVENT.

Powder, Warwick's (Earl of). *Syn.* PULVIS COMITIS WARWICENCIS, L. *Prep.* From scammony, prepared with the fumes of sulphur, 2 oz.; diaphoretic antimony, 1 oz.; cream of tartar, ½ oz.—*Dose.* 15 to 30 grs.

Obs. This is a modification of CORNACHINI'S POWDER. It is represented in the present Pharmacopœias by COMPOUND SCAMMONY POWDER. "Cornachini wrote a whole book about his powder, the proportions of the ingredients of which he varied according to circumstances." ('Med. Lex.')

Powder, Wash'ing. The numerous compounds vended under this name have for their basis the soda-ash of commerce, blended with common Scotch soda in variable proportions. The best of them consist either wholly or chiefly of the first of these substances. The alkaline matter is reduced to coarse powder, and stirred up with liquid size, or with a decoction of linseed, Irish moss, or British gum, and is then dried, and again crushed, or powdered, and at once put into the packages, in which it is rammed tight, and covered up immediately. The object aimed at by the manufacturer is to keep his commodity from the air as much as possible, because exposure renders it less caustic, and consequently, less detergent.

POWDERS. The following preparations have been placed under this head instead of under 'POWDER,' because some are invariably spoken of in the plural number, and the others may be conveniently noticed in classes or groups.

Powders, Efferves'cing. *Prep.* 1. (PULVERES EFFERVESCENTES—Ph. E.) Take of tartaric acid, 1 oz.; bicarbonate of soda, 1 oz. 54 grs. (534 grs.), or bicarbonate of potassa, 1 oz. 2 drs. 40 grs. (640 grs.); reduce the acid and either bicarbonate separately to fine powder, divide each of these into 16 powders, and preserve the acid and alkaline powders in separate papers of different colours.

2. (PULVERES EFFERVESCENTES CITRATI—Ph. D.) Take of citric acid (crystallised), 9 drs.; bicarbonate of soda, 11 drs., or bicarbonate of potassa, 13 drs.; proceed as last, dividing each into 18 parts.

3. (PULVERES EFFERVESCENTES TARTARIZATI—Ph. D.) Take of tartaric acid (in crystals), 10 drs.; bicarbonate of soda, 11 drs., or bicarbonate of potassa, 13 drs.; reduce them to powder, and divide them into 18 parts, as before. (See *below.*)

Powders, Gin'ger Beer. *Syn.* PULVERES EFFERVESCENTES CUM ZINGIBERE, L. *Prep.* 1. Powdered white sugar, 1 to 2 drs.; bicarbonate of soda, 26 grs.; finest powdered Jamaica ginger, 6 grs.; essence of lemon, 1 drop; mix, and wrap it in blue paper. In the white paper put of powdered tartaric acid, 35 grs., or of powdered citric acid, 30 grs.

2. Finest Jamaica ginger, 1 dr.; bicarbonate of soda, 5 drs.; white sugar, 16 drs.; essence of lemon, 6 or 8 drops; mix, and divide it between 12 papers (blue). For the white papers, divide tartaric acid, 6 drs., in the same way. By taking the drachms as ounces, the quantity will be sufficient for 8 dozen. For *use,* dissolve one of each colour separately in somewhat less than half a glass of water, mix the two, and drink the mixture whilst effervescing.

3. (In one bottle.)—*a.* The sugar and the saline ingredients are separately dried by a very gentle heat, then mixed in a dry room with the ginger and essence of lemon, and at once put into bottles.

b. By adding to the 'acidulated kali,' noticed at page 667, about 1-16th of its weight of the finest powdered Jamaica ginger (*i. e.* ½ dr. to each oz.; 1 oz. to each lb.) at the time of mixing the ingredients together. A dessert-spoonful, thrown into a tumbler two thirds filled with cold water, produces an excellent glass of ginger beer.

Powders, Ink. The article usually sold under this name is noticed under INK. Another formula, which we have adopted with considerable success, is as follows:—Good black ink, 3 pints, lump sugar, 1½ oz., and gum arabic, ½ oz., are put into a clean iron pan, and evaporated by the heat of boiling water, with occasional stirring, to dryness; the dried mass is reduced to powder, and divided into 12 parts, which are enveloped in either tin-foil or glazed paper, and kept dry. One of these papers dissolved in ½ pint of hot water forms that quantity of excellent black ink, without sediment, and which answers well with the copying press.

Powders, Lem'onade. *Syn.* LEMON SHERBET; LIMONADUM SICCUM, PULVIS PRO LIMONADO, L. *Prep.* 1. Powdered citric or tartaric acid, 12 grs.; powdered white sugar, ½ oz.; essence of lemon, 1 drop (or a little of the yellow peel of a lemon rubbed off on a piece of sugar); mix. For one glass.

2. White sugar, 4 lbs.; citric or tartaric acid, 1¼ oz.; essence of lemon, ¼ oz.; mix well, and preserve it in a bottle for use. 1 to 2 dessert-spoonfuls make a glass of lemonade. It is also put up in papers, containing about 2½ drs. each.

3. (EFFERVESCING.)—*a.* For the blue papers, take of powdered white sugar, 1 lb.; bicarbonate of soda, ½ lb.; essence of lemon, 1½ dr.; mix, and divide it between 6 dozen papers, Next divide tartaric or citric acid, 5 oz., between 6 dozen white papers. Or the two may be kept in bulk, in separate bottles.

b. (In one bottle.) As 'ACIDULATED KALI.' Some makers slightly increase the quantities of acid and essence of lemon there ordered.

Powders, Pol'ishing. *Prep.* 1. (For brass and copper.)—*a*. From rotten stone, 3 oz.; powdered soap, 1 oz.

b. From rotten stone, 7 oz.; powdered oxalic acid, 1 oz. Both are used with a little water. See Brass Paste.

2. (For gold.) Jeweller's rouge. See Sesquioxide of Iron.

3. (For ivory.) Pumice stone and putty powder.

4. (For plate.) See Plate and Plate Powder.

5. (For silver.) As the last.

Powders, Scented. *Prep.* 1. Cosmetic powders.—*a*. (Poudre de chipre.) Macerate oak moss in running water for 2 or 3 days, then dry, and powder it. *Used* as a basis for other powders, on account of its being highly retentive of odours. Reindeer moss and ragged hoary evernia are also used for the same purpose. See Cyprus Powder (*above*).

b. (Poudre de chipre de Montpelier.) From poudre de chipre, 2 lbs.; musk, 30 grs.; civet, 20 grs.; (the last two powdered by means of a little sugar;) cloves, ¼ oz.

c. (Poudre de fleurs d'oranges.) From starch or cyprus powder, 25 lbs.; orange flowers, 1 lb.; mixed in a covered chest, and stirred twice or thrice daily; the process being repeated, with fresh flowers, a second and a third time. Or, the plain powder is scented by the addition of a little neroli or essence of petit grain.

d. (Poudre de frangipanni.) From poudre de fleurs d'oranges and poudre de chipre, of each, 6 lbs.; essence of ambergris, 1 oz.; civet (powdered with sugar), ½ dr. Ash-gray colour.

e. (Poudre de jasmine.) As poudre de fleurs d'oranges, but using jasmin flowers.

f. (Poudre à la maréchale.) From poudre de chipre, 2 lbs.; starch powder, 1 lb.; calamus aromaticus, cloves, and cyperus perennis or rotundus, of each, 2 oz. Or, starch powder, 28 lbs.; powdered cloves, ¾ lb.; powdered orris root, ½ lb.; essence of ambergris, 2 drs.

g. (Poudre à la mousseline.) From orris root, 1 lb.; coriander seed, 6 oz.; mace and violet ebony, of each, 2 oz.; musk seed, cassia, cloves, and sandal wood, of each, 1 oz.

h. (Poudre de jonquille.) From jonquils, as poudre de jasmine.

i. (Poudre à l'œillet.) From plain powder, 2 lbs.; orris root and dried red rose leaves, of each, 1 lb.; cloves and musk seed, of each, 4 oz.; essence of bergamot and essence de petit grain, of each, ½ dr.

k. (Poudre de roses communes.) From pale roses, as poudre de fleurs d'oranges.

l. (Poudre de roses musquées.) From musk roses, as the last.

m. (Poudre à la vanille.) From poudre de chipre or cyprus, 3 lbs.; vanilla, powdered by means of sugar, 2 drs.; oil of cloves and essence of ambergris, of each, 20 drops.

n. (Poudre à la violette.) See Violet Powder (*above*).

The above are used as cosmetic powders for the skin and hair; also, but less frequently, for sachets, drawers, &c.

2. Sachet powder.—*a*. From orris root, 2 oz.; cassia, 1½ oz.; cloves, 1 oz.; yellow sandal wood, ½ oz.; oils of lavender and bergamot, of each, 1 dr.; otto of roses, 20 drops; musk and ambergris, of each, rubbed with a little sugar, 6 grs.; reduce the dry ingredients to coarse powder, mix them, and add the oils.

b. From corianders, orris root, rose leaves, and calamus aromaticus, of each, 4 oz.; lavender flowers, 8 oz.; rhodium wood, 1 dr.; musk, 20 grs.

c. From corianders, orris, calamus aromaticus, and red roses (dried), of each, 1 oz.; lavender flowers, 2 oz.; mace and cloves, of each, 1 dr.; essential oil of almonds, 10 drops.

d. As last, but substituting musk, 5 grs., for the oil of almonds.

e. From patchouli, 8 oz.; lavender flowers, (lightly dried), 3 oz.; orris root, 2 oz.; cloves, 1 oz.; essence of bergamot, 1 dr.; essences of ambergris and musk, of each, ½ dr.

These are used, along with cotton wool, to fill scent bags, cassolettes, &c.; and as scent powders for boxes, drawers, and the like. The scent is added to the dry ingredients, separately reduced to powder, and the whole is then passed through a fine sieve, to ensure perfect admixture.

3. Parfum pour les autres poudres. From poudre d'ambrette, 12 lbs.; civette, 1½ oz.; musk, 1 dr.; reduce the last two to powder by grinding them with some dry lump sugar, then mix the whole together and pass it through a sieve. *Used* to perfume hair powder, sachets, &c.

Powders, Seidlitz. *Syn.* Pulveres effervescentes aperientes, L. *Prep.* 1. Potassio-tartrate of soda (Rochelle salt) 2 drs.; bicarbonate of soda, 40 grs.; mix, and put it in a blue paper; tartaric acid, 35 grs., to be put in a white paper. For about ½ pint of water. Laxative.

2. (In one bottle.) From potassio-tartrate of soda, 12 oz.; bicarbonate of do., 4 oz.; tartaric acid, 3½ oz.; white sugar, 1 lb.; (all in fine powder;) dry each separately by a gentle heat, add of essence of lemon, ½ dr., mix well, pass the mixture through a sieve, and put it at once into clean dry bottles.—*Dose*. A dessert-spoonful, or more, to a tumblerful of water.

Obs. The above mixtures, though now universally sold as Seidlitz powder, do not, when dissolved, exactly resemble the natural water, which contains carbonates, sulphates, and chlorides of calcium and magnesium. However, the factitious article is equally effective, and much more agreeable.

Powders, Sher'bet. These are made of the same materials as lemonade powders, the flavouring ingredient being varied to suit the particular case.

Powders, So'da-water. *Syn.* EFFERVESCING POWDERS, E. SALINE P., SODAIC P., AËRATED SODA P.; PULVERES EFFERVESCENTES, L. *Prep.* 1. From bicarbonate of soda, 30 grs., in each blue paper; tartaric acid, 25 grs. (or citric acid, 24 grs.), in each white paper. One of each is dissolved separately in about ½ a glassful of water, and the two solutions mixed, and drank immediately. A cooling, wholesome summer beverage, but it should not be indulged in to excess.

2. (Chalybeated.) By adding 1 gr. of dried protosulphate of iron to each paper of acid. Tonic.

3. (Midgeley's.) Made by adding ⅛ gr. of tartarised antimony to each paper of acid. Refrigerant and diaphoretic. For the Ph. formulæ see EFFERVESCING POWDERS (*above*).

Powders, Soup. See CURRY POWDER, PEASE P., SPICE, &c.

Powders, Spruce Beer. *Syn.* PULVERES EFFERVESCENTES CUM ABIETE, L. *Prep.* As ginger-beer powders, but substituting essence of spruce, 3 to 6 drops, for the powdered ginger.

Powders, Tooth. *Syn.* PULVIS DENTIFRICII, L. The general principles which should be kept in view in the selection of the materials, and in the preparation of dentifrices, have been already fully noticed (see page 399), and need not, therefore, be repeated here. Care must be taken that all the dry ingredients be finely pulverised, and that the harder and gritty ones be reduced to the state of an impalpable powder, either by levigation or elutriation. The mixture of the ingredients must also be complete. This is the most readily effected by stirring them well together until they form an apparently homogeneous powder, and then passing this powder through a very fine sieve. Those which contain volatile substances should be preserved in closely corked wide-mouth bottles, and those which contain acidulous or gritty matter should not be frequently employed. The selection of the tooth brush likewise deserves attention. It should be sufficiently stiff to effect its purpose completely; but, at the same time, it should be so formed as not to cause irritation or injury to the gums during its use.

Prep. 1. Cuttle-fish bone and prepared chalk, of each, 2 oz.; oil of cloves, 20 drops. This may be perfumed at will, and medicated by any of the substances referred to under DENTIFRICES.

2. To the last add of powdered Castile soap, 2 oz.

3. Prepared chalk, 12 oz.; cuttle-fish bone, 8 oz.; orris root, 4 oz.; dragon's blood, 1½ oz.; oils of cloves and cassia, of each, ½ dr.

4. Prepared chalk, 1 lb.; pumice-stone, in impalpable powder, ¼ lb.; orris root, 2 oz.; pure rouge, ¼ oz.; neroli, ½ dr.

5. Yellow cinchona bark and myrrh, of each, ½ oz.; recently burnt charcoal, 3 oz.; cloves, 1 dr.

6. Pumice-stone, red coral, and powdered rhatany root, of each, 2 oz.; orris root, ½ oz.; essence of vanilla, ½ dr.

7. (AROMATIC TOOTH POWDER.) From cuttle-fish bone, 4 oz.; calamus aromaticus, 2 oz.; powdered Castile soap, 1 oz.; oil of cloves, ½ dr.

8. (ASIATIC DENTIFRICE.) From prepared red coral, 8¼ lbs.; Venetian red, ¾ lb.; prepared chalk and pumice-stone, of each, 1¼ lb.; China musk, 30 grs.

9. (Cadet's.) From lump sugar and charcoal, of each, 1 oz.; Peruvian bark, ½ oz.; cream of tartar, ¼ oz.; cinnamon, ½ dr.

10. (Camphorated.) See CAMPHORATED CHALK (page 317).

11. (CHARCOAL DENTIFRICE.) From charcoal, preferably that from the willow or the areka nut, either alone or combined with twice its weight of prepared chalk. Scent or medicinals injure it. (See 9, 19, and 26.)

12. (CORAL DENTIFRICE.) See 16, 23, and 25 (*below*).

13. (Deschamp's ALKALINE DENTIFRICE.) From powdered talc, 4 oz.; bicarbonate of soda, 1 oz.; carmine, 6 grs.; oil of mint, 12 or 15 drops.

14. (FLORENTINE DENTIFRICE.) From prepared shells, 4 oz.; orris root, 1½ oz.; bitartrate of potassa, ¼ oz.; Florentine lake, q. s. to colour.

15. (GALVANIC DENTIFRICE.) From gold, 3 leaves; silver, 4 leaves; triturate them with alum and sulphate of potassa, of each, 1½ dr.; then add, of dry common salt, pellitory of Spain, and Peruvian bark, of each, 1 dr.; prepared hartshorn, 1 oz.; mix, and either colour it blue with smalts or red with lake. A useless compound.

16. (Grosvenor's.) From red coral, 3 lbs.; prepared oyster-shells, 2½ lbs.; orris powder, ½ lb.; oil of rhodium, 25 drops. Rose-pink is now commonly substituted for the coral.

17. (Hemet's.) From cuttle-fish bone, 6 oz.; cream of tartar, 1 oz.; orris root, ½ oz.

18. ('Lancet.') Red bark and Armenian bole, of each, 1 oz.; powdered cinnamon and bicarbonate of soda, of each, ½ oz.; oil of cinnamon, 2 or 3 drops.

19. (Lardner's.) From charcoal, in very fine powder, 1 oz.; prepared chalk, 3 oz.; mix.

20. (Miahle's RATIONAL DENTIFRICE.) From sugar of milk, 3 oz.; pure tannin, 3 drs.; red lake, 1 dr.; oils of mint and aniseed, of each, 7 or 8 drops; neroli, 4 or 5 drops.

21. (MYRRH DENTIFRICE.) From cuttle-fish bone, 6 oz.; myrrh and orris root, of each, 2 oz.

22. (PEARL DENTIFRICE.) From heavy carbonate of magnesia or precipitated chalk, 1 lb.; finest smalts, 3 drs.; essence de petit grain, ½ dr.

23. (Pelletier's QUININE DENTIFRICE.) From prepared red coral, 3 oz.; myrrh, 1 dr.; disulphate of quinine, 12 to 15 grs.

24. (Ph. Russ.) Cinchona bark, 4 oz.; orris root, 2 oz.; catechu and myrrh, of each, 1½ oz.; sal ammoniac, 1 oz.; oil of cloves, 20 drops.

25. (POUDRE DENTIFRICE—P. Cod.) Red coral, red bole, and cuttle-fish bone, of each, 3 oz.; dragon's blood, 1½ oz.; cinnamon, ½ oz.; cochineal, 3 drs.; cloves, 1 dr.; bitartrate of potassa, 4½ oz.; reduce them separately to very fine powder before mixing them. This is the 'coral dentifrice' of the French.

26. (Rignini's.) From charcoal, 1 oz.; yellow bark, ½ oz.

27. (ROSE DENTIFRICE.) From precipitated chalk, 6 oz.; cuttle-fish bone, 3 oz.; bicarbonate of soda, 2 oz.; red lake, ½ oz.; otto of roses, 20 drops.

28. (Ruspini's.) From cuttle-fish bone, 8 oz.; Roman alum and orris root, of each, 1 oz.; cream of tartar, 2 oz.; oil of rhodium, 6 or 8 drops.

29. (VIOLET TOOTH POWDER.) From orris root, 3 oz.; cuttle-fish bone and rose pink, of each, 5 oz.; precipitated chalk, 12 oz.; pure indigo, q. s. to give it a pale violet tinge.

30. (Zieter's.) From finely powdered calcined hartshorn and cuttle-fish bone, of each, 6 oz.; calamus aromaticus, cassia, and pellitory of Spain, of each, 1 oz.; essence of vanilla, 1 dr.; essence of ambergris, 10 or 12 drops.

Powders, Worm. *Syn.* PULVERES ANTHELMINTICI, P. VERMIFUGI, L. *Prep.* 1. (Bouchardat.) Powdered Corsican moss and worm-seed, of each, 5 drs.; calomel, 40 grs.; rub them together.

2. (Collier.) From powdered jalap and scammony, of each, 1 dr.; cream of tartar, 2 drs.; Ethiop's mineral, 3 drs.

3. (Guibourt.) Sulphate of iron, 1 dr.; tansy, 2 drs.; worm-seed, 3 drs.

4. (P. Cod.) Corsican moss and worm-seed, of each, 2 oz.; rhubarb, 1 oz.; rubbed to a fine powder, and carefully mixed.

POX. A corruption of a Saxon word, originally applied to pustules or eruptions of any kind, but now restricted to varicella, variola, vaccinia, and, in its unqualified form, to syphilis. (See *below*.)

Chick'en-pox. *Syn.* WATER-POX; VARICELLA, L. An eruptive disease, consisting of smooth, semi-transparent vesicles, of various sizes, which afterwards become white and straw-coloured, and about the fourth day break and scale off, without leaving any permanent mark behind them. In hot weather the discharge sometimes become purulent, and at others the eruption is attended with considerable fever. Sometimes the vesicles assume a pointed form, and the fluid remains clear throughout the disease; it is then frequently called the 'swine-pox.' When the vesicles are large and globular, and their contents, at first whey-coloured, afterwards turn yellow, it is popularly known as 'hives.'

The treatment of chicken-pox consists in the adoption of a light, vegetable diet, and in the administration of mild saline aperients and cooling drinks.

The chicken-pox, except in children of a very bad habit of body, is an extremely mild disease. Like the smallpox, it rarely attacks the same person more than once during life.

Cow-pox. *Syn.* VACCINIA, VARIOLA VACCINA, L. This disease was proposed as a substitute and a preventive of smallpox, by Dr. Jenner, in 1798, and its artificial production (vaccination) has rendered smallpox a comparatively rare disease in Britain. There appears no reason to doubt that the pretensions of the advocates of vaccination have been fully justified by the experience of more than half a century; or, that this disease, when actively developed, evinced by the completeness and maturation of the pustules, acts as a prophylactic of smallpox.

The process of vaccination is similar to that of inoculation for smallpox. The point of a lance is wetted with the matter taken from one of the pustules, and is then gently inserted under the cuticle, and the scratch afterwards rubbed over with the same. Hæmorrhage should be avoided, as the blood is apt to wash away the virus, or to form a cake which shields the living tissue from its action.

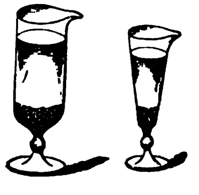
Smallpox. *Syn.* VARIOLA, L. This disease comes on with the usual symptoms of inflammatory fever. About the third day, red spots, resembling flea-bites, make their appearance on the face and head, and gradually extend over the whole body. About the fifth day, small circular vesicles, depressed in the centre, surrounded by an areola, and containing a colourless fluid, begin to form, when the feverish symptoms abate; about the sixth day, the throat becomes sore; about the eighth day, the face is swollen; and about the eleventh day, the pustules acquire the size of a pea, and cease to enlarge, the matter which they contain becomes opaque and yellow, a dark central spot forms on each, the swelling of the face subsides, and secondary symptoms of fever come on; the pustules become rough, break, and scab over, and a dark spot remains for some days, often followed by permanent indentations, popularly known as 'pock-marks.' At the end of the sixteenth or eighteenth day, the symptoms usually disappear. In the confluent smallpox, a severer form of the disease, the pustules coalesce, the eruption is irregular in its progress, and the inflammatory symptoms are more severe.

The treatment of ordinary cases of smallpox resembles, for the most part, that mentioned above for chicken-pox. As soon as the febrile symptoms become marked, the patient should not be suffered to lie in a hot bed, but on a mattress, in a cool and well-ventilated apartment, and antiseptic cooling drinks should be freely administered. When convulsions occur, or great irritability exists, small doses of morphine, opium, or camphor, may be administered, and obstinate vomiting arrested by effervescing saline draughts. When the skin is pale and cold, the pulse weak, and the eruption languidly developed, the warm or tepid bath is often serviceable. An infusion of the root of *Sarracenia pupurea*, an American plant, has been strongly recommended as a preventive and cure of smallpox, but many of our most eminent physicians regard it as valueless. The application on the third day of a mask formed of thin muslin, covered with mercurial ointment, and having holes cut in it for the nostrils, eyes, and mouth, will effectually prevent 'pitting.' (Dr. Stewardson.) With the same intention, some persons recommend the puncture of the pustules as soon as they are mature. A solution of India rubber in chloroform is now often painted over the face when the eruption has become fully developed. The chloroform quickly evaporates, leaving an elastic film of india-rubber, which almost entirely removes the itchiness of the pustules and prevents 'pitting.' To remove the pock-marks, whether recent or old, nothing appears to be better than warm sea-bathing, or the use of tepid ioduretted lotions.

The smallpox is eminently contagious, but only attacks the same person once during life. Formerly, a milder form of the disease was propagated by inoculation, a practice introduced into England from Turkey, by Lady Mary Wortley Montague, about the year 1721. At the present day, in England, inoculation, as well as the exposure of a patient labouring under smallpox, is penal, the punishment being either by fine or imprisonment. See Cow-pox (*above*).

PRECIP'ITATE. Any substance which has separated from its solution in a solid and, usually, a pulverulent or flocculent form. The substance by which such a change is produced is called the 'precipitant'; and the act or operation by which it is effected is called 'precipitation.' The old chemists gave this name to several compounds. Red precipitate, or precipitate *per se*, is the red oxide of mercury prepared by heat. White precipitate is the Ammoniated mercury of the B. P.

PRECIPITA'TION. The formation or subsidence of a precipitate. (See *above*.) When the precipitate is the chief object of the process, it is necessary to wash it, after it is separated, by filtration. This operation requires little attention when the substance thrown down is insoluble in water; but when it is in some degree soluble in that liquid, great attention is required to prevent the loss which might result from the use of too much water. Precipitates soluble in water, but insoluble in alcohol, are frequently, on the small scale, washed with spirit more or less concentrated.



The best precipitating vessel is a very tall glass jar, furnished with a lip and spout, and narrower at the bottom than at the mouth, so that the precipitate may readily collect by subsidence, and the supernatant liquor be decanted off with more ease.

PREG'NANCY. For the preservation of the health, and the prevention of the numerous discomforts and dangers which so frequently attend this condition, nothing is so effective as exercise. It is this that is so favourable to the humble peasant, and it is its absence that inflicts such calamities on the wealthier classes. Exercise, moderate and unfatiguing, when assisted by regular habits, and a diet nutritious, but not too liberal, is, indeed, capable of not only affording pleasure and increasing the comforts of existence, but is also generally sufficient to greatly lessen the severity of the sufferings, and to ward off the not unfrequently fatal results which terminate this interesting condition.

The sickness of pregnancy may be greatly ameliorated, if not removed, by the occasional use of a saline aperient, and by effervescing draughts formed with the bicarbonate of potassa and citric acid. The oxalate of cerium is strongly recommended by Professor Simpson, of Edinburgh, as a remedy for obstinate vomiting in pregnancy.—*Dose.* 1 gr. to 2 grs. three times a day in pills.

PRESCRI″BING (Art of). Besides a knowledge of diseases and their treatment, much of the success of the physician depends on circumstances connected with the form in which the remedies are exhibited. In writing a prescription, it is necessary to consider the age, sex, temperament, habits, and idiosyncrasy of the patient, as well as the conditions of climate and season, before the selection of the leading medicament, and the apportioning of the dose. The most convenient form of exhibiting it, whether it should be given alone or in some simple form, or combined with other ingredients, the compatibility of the latter, and how far these are likely to assist, impede, or modify its operation, must also receive the consideration of the practitioner. Without a careful attention to all these circumstances, the most valuable remedies may be rendered worthless, and the highest medical skill and the best intentions frustrated.

A prescription generally contains several medicinal substances, which are distinguished by medical writers by names indicative of the office which each of them performs. These are—1. The basis, which is the principle or most active ingredient;—2. The adjuvant, or that which is intended to promote the action of the base;—3. The corrective, intended to correct, modify, or control its action, or to cover its odour or taste, as when we add carminatives or diaphoretics to carthartics, or aromatics or liquorice to nauseous substances;

—4. The EXCIPIENT, or that which gives the whole a commodious or agreeable form, and which, consequently, gives the prescription its peculiar character, as that of draught, mixture, pills, &c. To these, certain Continental writers add a 5th,—The INTERMEDIUM, which is the substance employed to unite remedies which are not, by themselves, miscible with each other, or with the excipient. Of this character are the yolk of egg and mucilage, employed in the preparation of emulsions.

The medicinal substances, with the quantities to be taken, generally arranged as above, are said to form the 'inscription,'—the directions as to their combination or dispensing, which usually come next, the 'subscription,' and—the orders for the exhibition of the compound medicine, which follow these, the 'instructions.' These distinctions are, however, in many cases more technical than useful.

In choosing the form of a prescription, it should be recollected that solutions and emulsions generally act with more certainty and rapidity than powders diffused through water; and these, again, than the semi-solid and solid forms of medicine, represented by electuaries, boluses, and pills. On these matters, however, the taste and wishes of the patient should not be disregarded. For this purpose, the taste of nauseous medicines should be disguised, as much as possible, by the judicious selection of an appropriate corrective or excipient. Thus, the disagreeable flavour of Epsom salt may be in a great measure covered by dissolving it in peppermint water; that of aloes, by liquorice; that of castor oil and copaiba by orange peel; and that of powdered bark, by mixing it with milk immediately before taking it; whilst the bitterness of all bitter substances is concealed by strong coffee.

In order that a prescription may be well made, it is not necessary to unite all the elements above referred to. The basis and the excipient are the only two which are absolutely necessary, since there are many medicines which have no need of an adjuvant. The agreeable flavour and odour of some, and the mild and harmless nature of others, often render the intervention of a corrigent unnecessary when they are employed. A single substance may also "be capable of answering two or more purposes. Thus, the adjuvant may also act as a corrigent, as when the addition of soap to aloes, or to extract of jalap, lessens their griping properties, and at the same time promotes their action. In the same way neutral salts correct the colic which follows the use of resinous purgatives, and accelerate their action." According to Gaubius, the number of ingredients in a prescription should scarcely ever exceed three or four. See DOSE, MEDICINES, INCOMPATIBLES, PILLS, &c.

PRESCRIP'TIONS. Recipes or formulæ for the preparation and exhibition of medicines intended, generally, for immediate use. See PRESCRIBING (*above*).

PRESERVES'. A general term, under which are included the various fruits and vegetables which are seasoned and kept in sugar or syrup, more especially those which are so preserved whole or in slices. See CANDYING, JAM, MARMALADE, &c.

PRESS (Correcting for the). See PROOFS.

PRINCE'S METAL. One of the names for Dutch gold. (See page 580.)

PRINT'ING (Anastatic). A method of zincography, patented in 1845, having for its object the reproduction of drawings, engravings, and letter-press, from copies however old. To describe briefly the preparation of a plate or cylinder, let us suppose a newspaper about to be reprinted by this means. The sheet is first moistened with dilute acid and placed between sheets of blotting paper, in order that the superfluous moisture may be absorbed. The ink resists the acid, which attacks the blanks only. In all cases where the letter-press is of recent date, or not perhaps older than half a year, a few minutes suffice for this purpose. The paper is then carefully placed upon the plate with which the letter-press to be transferred is in immediate contact, and the whole passed under a press, on removal from which, and on carefully disengaging the paper, the letters are found in reverse on the plate. A preparation of gum is then applied to the plate by means of a roller, after which the letters receive an addition of ink, which is immediately incorporated with that by which they are already formed. These operations are effected in a few minutes. The surface of the plate round the letters is next bitten in a very slight degree by dilute acid, and on the fresh application of the ink it is rejected by the zinc, and received only by the letters, which are charged with the ink by the common roller used in hand-printing. Each letter comes from the press as clear as if it had been imprinted by type metal; and the copies are fac-similes, which cannot easily be distinguished from the original sheet.

When pen-and-ink drawings are to be reproduced, they are made on any paper free from hairs or filaments, and well-sized. The ink used is a preparation made for the purpose, closely resembling lithographic ink, and may be mixed to any degree of thickness in pure distilled water. It should be used fresh, and slightly warm when a fine effect is to be given. In making or copying a design a pencil may be used; but the marks must be left on the paper, and by no means rubbed with India rubber or bread. It is necessary to add, that the paper should be kept quite clean and free from friction, and should not be touched by the fingers, inasmuch as it will retain marks of very slight touches.

Before closing this notice of anastatic printing, it may be proper to remark, that the great pretensions originally set up by the patentees have not been fulfilled by its extensive adoption in trade.

PRINT'ING INK. *Prep.*—*a.* The VARNISH. Linseed or nut oil, 10 or 20 galls., is set over the fire in an iron pot capable of containing fully as much more; when it boils, it is kept stirred with an iron ladle, and, if it does not take fire of itself soon after the smoke begins to rise, it is kindled by means of a piece of burning paper, stuck in the cleft end of a long stick; the pot is shortly afterwards removed from the fire, and the oil is suffered to burn for about half an hour, or until a sample of the varnish cooled upon a pallet knife may be drawn into strings of about ½ inch long, between the fingers; the flame is now extinguished by the application of a closely fitting tin cover, and, as soon as the froth of the ebullition has subsided, black resin is added. in the proportion of ¾ lb. to 1 lb. for every quart of oil thus treated; the mixture is next stirred until the resin is dissolved, when dry brown soap, cut into slices, 1¾ lb., is further added (cautiously), and the ingredients are again stirred with the spatula until the whole is united, the pot being once more placed over the fire to promote the combination; when this is effected, the varnish is removed from the heat, and, after a good stirring, is covered over and set aside.

b. The INK. Indigo and Prussian blue, of each, in fine powder, 2½ oz.; mineral lampblack (finest), 4 lbs.; vegetable lampblack, 3½ lbs.; stir them gradually into the warm varnish (*a*), and submit the mixture to careful grinding, either in a mill or by means of a slab and muller. On the large scale, steam power is now generally employed for this purpose.

An extemporaneous superfine black ink may be made by the following formula:—Take of balsam of copaiba (pure), 9 oz.; lampblack, 3 oz.; indigo and Prussian blue, of each, ½ oz.; Indian red, ¾ oz.; yellow soap (dry), 3 oz.; grind the mixture to an impalpable smoothness by means of a stone and muller. Canada balsam may be substituted for balsam of copaiba where the smell of the latter is objectionable, but the ink then dries very quickly.

COLOURED PRINTING INKS are made in a similar way from the following pigments:—Carmine, lakes, vermilion, chrome yellow, red lead, orange red, Indian red, Venetian red, for red; orange chrome, chrome yellow, burnt terra di sienna, gall-stone, Roman ochre, yellow ochre, for orange and yellow; verdigris, Scheele's green, Schweinfurt green, blues and yellows mixed, for greens; indigo, Prussian blue, Antwerp b., cobalt b., charcoal b., for blue; lustre, bronze powders, &c., for metallic colours; and umbia, sepia, &c., for brown.

Obs. It is necessary to prepare two kinds of varnish, varying in consistence, from more or less boiling, to be occasionally mixed together as circumstances may require; that which answers well in hot weather being too thick in cold, and *vice versâ*. Large characters also require a thinner ink than small ones. Old linseed oil is preferable to new. Yellow resin soap is preferred for black and dark-coloured inks, and white curd soap for light ones.

A good varnish may be drawn into threads like glue, and is very thick and tenacious. The oil loses from 10⅝ to 14⅝ by the boiling. Mr. Savage obtained the large medal of the Society of Arts for his black ink made as above.

PRINTS (Ackerman's Liquor for). *Prep.* Take of the finest pale glue and white curd soap, of each, 4 oz.; boiling water, 3 pints; dissolve, then add of powdered alum, 2 oz. *Used* to size prints and pictures before colouring them.

PROOF. See ACETIMETRY, ALCOHOLOMETRY, &c.

PROOFS (Correct'ing). The specimen on the next page, with the notes, will, if carefully perused, put the reader into possession of all the secrets of this useful art.

PROPYL'IC ALCOHOL. C_3H_7O. *Syn.* HYDRATED OXIDE OF PROPYL, TRITYL ALCOHOL. A liquid boiling at 204·8° Fahr., obtained by repeatedly rectifying the first products of the distillation of the fusel-oil of marc-brandy. It stands to ethylic alcohol (ordinary alcohol) in the same relation in which the latter stands to methylic alcohol (pyroxylic spirit).

PRO'TEIN. The name given by Mülder to a substance which he regarded as the original matter from which animal albumen, casein, and fibrin, were derived; but which is now considered as a product of the decomposition of those important principles by moderately strong caustic alkali.

Prep. (Liebig.) Albumen, casein, or fibrin is dissolved in moderately strong potassa, the solution heated for some time to 120° Fahr., and acetic acid added; a gelatinous precipitate subsides, which, after being washed and dried, is protein.

Obs. The names binoxide and teroxide of protein have been given by Mülder to products of the long-continued action of boiling water upon fibrin in contact with the air.

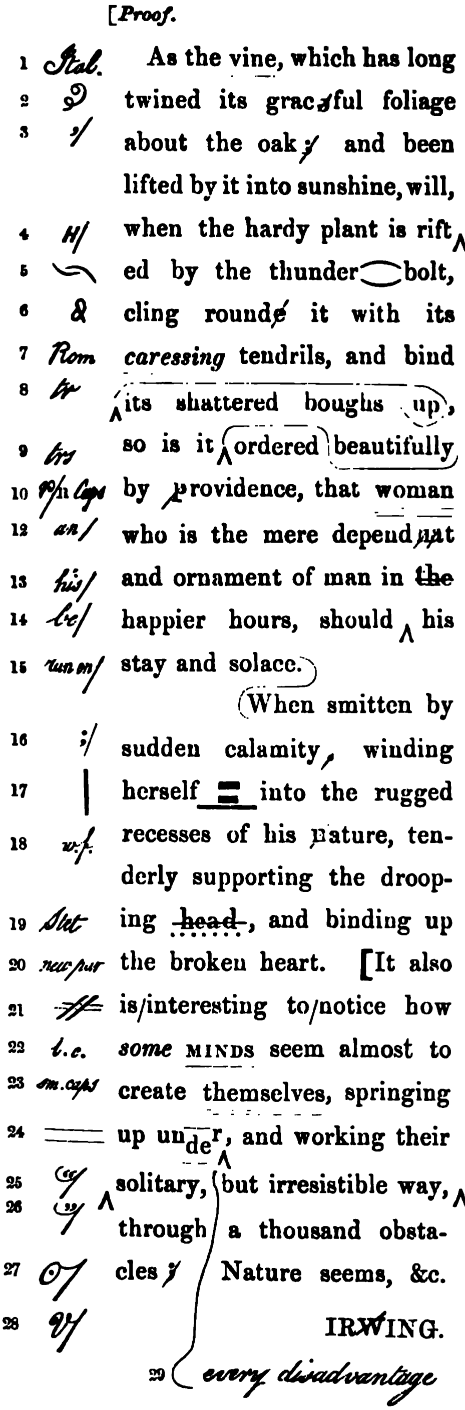
PRO'TIDE. A soluble, straw-yellow substance, formed, along with other products, by the action of strong solution of potassa on albumen, fibrin, or casein. See ERYTHROPROTIDE.

PROTO-. See NOMENCLATURE.

PROVI''SIONS (Preservation of). See PUTREFACTION.

PRUNES. [Fr.] The fruit of cultivated varieties of *Prunus domestica* (Linn.). The dried fruit (FRENCH PRUNES OR PLUMS; PRUNUM—B. P., Ph. L., PRUNA—Ph. E. & D.) is cooling and gently laxative, and, as such, is usful in habitual costiveness and fevers.

Pulp of Prunes. *Syn.* PREPARED PRUNES; PULPA PRUNORUM, PRUNUM PRÆPARATUM



[Proof.

1 Ital. As the vine, which has long

2 twined its gracǝful foliage

3 ,/ about the oak; and been

lifted by it into sunshine, will,

4 -/ when the hardy plant is rift‸

5 ed by the thunder bolt,

6 cling rounde it with its

7 Rom *caressing* tendrils, and bind

8 tr ‸its shattered boughs up,

9 tr so is it ‸ordered beautifully

10 P/ Caps by providence, that woman

12 an/ who is the mere dependnat

13 his/ and ornament of man in ~~the~~

14 be/ happier hours, should ‸ his

15 run on/ stay and solace.

(When smitten by

16 ;/ sudden calamity, winding

17 | herself ▬ into the rugged

18 w.f. recesses of his nature, ten-

derly supporting the droop-

19 Stet ing ~~head~~, and binding up

20 new par the broken heart. [It also

21 # is/interesting to/notice how

22 l.c. *some* MINDS seem almost to

23 sm.caps create themselves, springing

24 up unde r, and working their

25 ‘‘/ ‸solitary, but irresistible way,‸

26 ’’/ through a thousand obsta-

27 ⊙/ cles; Nature seems, &c.

28 v/ IRWING.

29 (every disadvantage

[*The same corrected.*]

As the *vine*, which has long twined its graceful foliage about the oak, and been lifted by it into sunshine, will, when the hardy plant is rifted by the thunderbolt, cling round it with its caressing tendrils, and bind up its shattered boughs, so is it beautifully ordered by Providence, that WOMAN, who is the mere dependant and ornament of man in his happier hours, should be his stay and solace when smitten by sudden calamity; winding herself into the rugged recesses of his nature, tenderly supporting the drooping head, and binding up the broken heart.

It also is interesting to notice how *some minds* seem almost to create THEMSELVES, springing up under every disadvantage, and working their "solitary, but irresistible way," through a thousand obstacles. Nature seems, &c.

IRVING.

Explanation of the marks:

1. When a letter or word is to be in *italics*.
2. When a letter is turned upside down.
3. The substitution of a comma for another point or letter.
4. The insertion of a hyphen; also marked (-).
5. When letters should be close together.
6. When a letter or word is to be omitted.
7. When a word is to be changed to roman.

8, 9. Two methods of marking a transposition: when there are *several* words to be transposed, and they are much intermixed, it is a common plan to number them, and to put the usual mark in the margin.

10. Substitution of a capital for a small letter.
11. When a word is to be changed from small letters to capitals.
12. The transposition of letters in a word.
13. The substitution of one word for another.
14. When a word or letter is to be inserted.
15. When a paragraph occurs improperly.
16. The insertion of a semicolon.
17. When a space or quadrat stands up, and is seen along with the type.
18. When letters of a wrong fount are used.
19. When words crossed off are to remain.
20. The mark for a paragraph, when its commencement has been neglected. Sometimes the sign [, or ¶, or the word '*break*,' is used instead of the syllables '*New Par.*'
21. For the insertion of a space when omitted or insufficient.
22. To change capitals to small letters.
23. To change small letters to small capitals.
24. When lines or words are not straight.

25, 26. The insertion of inverted commas. The apostrophe is similarly marked.

27. The insertion of a period when omitted, or in place of another point or letter.
28. Substitution of one letter for another.
29. The method of marking an omission or insertion when too long for the side margin.

(Ph. L.), L. *Prep.* The imported dried fruit is boiled gently for four hours with water, q. s. to cover them, and then pressed, first through a fine cane sieve, and afterwards through a fine hair sieve; the pulp is, lastly, evaporated by the heat of a water bath to the consistence of a confection. A better plan is to use as little water as possible, by which the necessity of subsequent evaporation is avoided. *Used* in the preparation of confection of senna.

PRU″NING varies according to the kind of plant or tree operated on, and the particular object in view, and its skilful performance must, therefore, greatly depend on the experience and knowledge of the gardener. "In the operation of pruning, the shoots are cut off close to the buds, or at a distance not greater than the diameter of the branch to be cut off; because without the near proximity of a bud, the wounds will not heal over. In shoots which produce their buds alternately the cut is made at the back of the bud, sloping from it, so that it may be readily covered by the bark in the same or in the following year; but in the case of branches where the buds are produced opposite each other, either one bud must be sacrificed or the branch must be cut off at right angles to its line of direction, which is most conveniently done with the pruning shears." (Loudon.)

PRUS′SIAN AL′KALI. Ferrocyanide of potassium.

PRUS′SIAN BLUE. *Syn.* Berlin blue, Paris b., Ferrocyanide of iron, Prussiate of iron, Cyanuret of i. This is the well-known blue pigment of the shops.

Prep. 1. The crude but clear solution of ferrocyanide of potassium (blood lye) is precipitated by a mixed solution of alum, 2 parts, and green sulphate of iron, 1 part; the dingy greenish precipitate that falls gradually becomes blue by absorption of atmospheric oxygen, which is promoted by exposure and agitation of the liquor; as soon as it has acquired its full colour, the sediment is repeatedly washed with water, and is then drained, and dried, at first in a stove, but afterwards on chalk stones. *Product* large, but inferior in quality.

2. Repeatedly digest and wash the precipitate obtained by the above process, in very dilute hydrochloric acid, and then in pure water; drain and dry it, as before. Superior.

3. (Paris blue.)—*a.* Neutralise the solution of ferrocyanide of potassium (blood lye) with dilute sulphuric acid, precipitate the liquid with a solution of any persalt or sesquisalt of iron (as the persulphate, nitrate, sesquichloride, or peracetate); well wash the precipitate with water, and dry it, as before. A very rich and intense colour.

b. (Hochstätter.) Crystallised ferrocyanide of potassium and green sulphate of iron, of each, 6 parts, are each separately dissolved in water, 15 parts; after the admixture of the solutions, and frequent agitation, oil of vitriol, 1 part, and fuming hydrochloric acid, 24 parts, are stirred in; after some hours have elapsed, a strained solution of chloride of lime, 1 part, dissolved in water, 80 parts, is gradually added, the addition being stopped as soon as an effervescence from the escape of chlorine is perceived; the whole is now left for 5 or 6 hours, when the precipitate is thoroughly washed in pure soft water, drained, and dried. Or, instead of the above, the precipitate is at once washed in dilute nitric acid, until its colour ceases to be improved by the process. The *product* is of the finest quality.

Prop. Insoluble in water and in dilute acids, except the oxalic, in solutions of which it dissolves freely, when pure; oil of vitriol dissolves it to a white pasty mass, which is again precipitated of the usual blue colour by water; alkalies instantly decompose it, and so do red oxide of mercury and some other oxides when boiled with it; it burns in the air like tinder, leaving an ash of oxide of iron. It is not poisonous.

Pur., &c. The quality of Prussian blue may be estimated by the richness of its colour, and by the quantity of potassa or soda required to destroy this. If it effervesces with acids, it contains chalk; and if it forms a paste with boiling water, it is adulterated with starch. It is pure if, "after being boiled with dilute hydrochloric acid, ammonia throws down nothing from the filtered liquid." (Ph. L. 1836.) It is distinguished from indigo by exhibiting a coppery tint when broken, but which is removed by rubbing with the nail.

Concluding remarks. The commercial Prussian blue is not pure ferrocyanide of iron, but a mixture of this salt with varying proportions of the ferricyanide of iron and potassium, which also has a fine deep blue colour. The object in employing alum is to prevent or lessen the precipitation of oxide of iron by the free alkali in the blood lye, but a portion of alumina is in consequence thrown down with the blue, and tends to render it paler and increase the product. The quantity of alum employed may be varied according to the shades of the intended blue. Samples containing this contamination must not be employed medicinally. (See *page* 240.)

Prussian Blue, Sol′uble. *Prep.* 1. (Basic Prussian blue.) By adding a solution of protosulphate of iron to a solution of ferrocyanide of potassium; a bluish-white precipitate, turning dark blue by free exposure, is formed, which, after it has acquired this colour, is washed until it begins to dissolve in the water, and colour it blue; it is then either collected and dried, or is at once dissolved in pure water. This variety is not precipitated from its solution by alcohol.

2. (Ferrocyanide of potassium and iron.) By precipitating a solution of a sesquisalt or persalt of iron (as the persulphate, pernitrate, peracetate, or sesquichloride) with a stronger solution of ferrocyanide of potassium,

so that the latter may be in considerable excess. A blue precipitate is formed, which is treated as before. This variety is precipitated by alcohol. Both are freely soluble in pure water, but not in water which has the slightest saline contamination. Hence it is that lengthened exposure to the atmosphere, and the use of the common steel pen, causes the gradual precipitation of this substance from its solution when used as ink. See WRITING FLUIDS.

PRU″SSIC ACID. See HYDROCYANIC ACID.

PSEU'DO-MOR'PHIA. A substance of little importance, occasionally found in opium. It differs from morphine chiefly in not decomposing iodic acid. It is said to contain nitrogen.

PTIS'AN. *Syn.* PTISANA, L. A decoction made of pearl barley, liquorice, raisins, and other like vegetable matters, either alone or so slightly medicated as to be taken as a common drink in fevers, catarrhs, &c. Those retained in English pharmacy have been already noticed. The French physicians often employ this form of medicine. The 'tisanes' of the P. Cod. are numerous. See DECOCTION, INFUSION, JULEP, TISANE, &c.

PTY'ALIN. A peculiar animal matter, analogous to diastase, obtained from the saliva. It is soluble in water, but insoluble in alcohol.

PUCHA PAT. *Syn.* PATCHOULI. Puchá pât is the dried foliaceous tops of *Pogostemon Patchouli*, an Indian species of *Labiatæ*. It is much used in perfumery, particularly for making sachets; but its odour, although very durable, is not so agreeable as that of many other substances, unless it is combined with lavender, bergamot, ambergris, musk, or some other like perfume.

PUD'DINGS. The instructions given under CAKES, PIES, &c., will be found, with some slight modifications, also to apply to puddings, and, therefore, need not be repeated here. Soyer tell us that every sort of pudding, if sweet or savory, is preferably dressed in a basin, instead of in a cloth. If boiled in a basin, the paste receives all the nutriment of the materials, which, if boiled in a cloth, are dissolved out by the water, when by neglect it ceases boiling. To cause them to turn well out, the inside of the basin should be thoroughly 'larded' or rubbed with butter.

In the preparation of meat puddings the "first and most important point is never to use any meat that is tainted; for in pudding, above all other dishes, it is least possible to disguise it by the confined progress which the ingredients undergo. The gradual heating of the meat, which alone would accelerate decomposition, will cause the smallest piece of tainted meat to contaminate all the rest. Be particular, also, that the suet and fat are not rancid, ever remembering the grand principle that everything which gratifies the palate nourishes."

"A pudding cloth, however coarse, ought never to be washed with soap; it should be simply dried as quickly as possible, and kept dry and free from dust, and in a drawer or cupboard free from smell." (Soyer.)

PUD'DLING. See IRON.

PULMONI'TIS. Inflammation of the lungs.

PULP. *Syn.* PULPA, L. The softer parts of plants, more particularly of fruits, separated from the fibrous and harder portions.

"Pulpy fruits, if they be unripe, or ripe and dried, are to be placed in a damp situation until they become soft; then the pulp is to be pressed out through a hair sieve; afterwards, it is to be boiled with a gentle heat, frequently stirring; and, finally, the (excess of) water is to be evaporated in a water bath, until the pulp acquire proper consistence.

"Press the pulpy fruits which are ripe and fresh through a hair sieve, without boiling them." (Ph. L. 1836.)

PULVERISA'TION. The reduction of any substance to dust or powder.

On the small scale, pulverisation is usually performed by means of a pestle and mortar; on the large scale, by stamping, grinding or cutting the substance in a mill. A few soft substances, as carbonate of magnesia, carbonate of lead, &c., may be pulverised by simply rubbing them through a fine sieve, placed over a sheet of paper; whilst many hard, gritty substances can only be reduced to fine powder by porphyrisation or levigation. Elutriation, or 'washing over,' is adopted for several substances, as chalk, antimony, &c., which are required to be reduced to fine powder on the large scale. For some articles which are very tough, fibrous, or resisting, a rasp or file is employed. Whichever of these methods is adopted, the body to be powdered must be very dry, and where spontaneous drying is insufficient, artifical desiccation in a stove or oven, gently heated, is employed. To facilitate this, the substance should be first cut into pieces or crushed small. On the other hand, a few substances, as rice, sago, nux vomica, and St. Ignatius's bean, are often soaked in water, or steamed, before being further operated on. Whenever a substance cannot be dried completely, without an alteration of its properties, an intermedium is had recourse to, by which the moisture may be absorbed, or its state of aggregation modified. Thus, sugar is employed in pulverising civet, musk, nutmeg, and vanilla. When camphor is to be pulverised, the addition of a very small quantity of alcohol renders the operation easy. In other cases, the intermedium is of so hard a nature as to assist in breaking down the substance to be powdered; thus, gold leaf is reduced to powder by rubbing it with sulphate of potassa, and afterwards removing this last by means of water. Fusible metals, as zinc and tin, are powdered by pouring them into a mortar, and stirring them rapidly whilst cooling; or, by briskly agitating them, in the melted state, in a woollen box covered with chalk or whiting. Phosphorus is powdered by melting it in urine or lime water, and then shaking the bottle until its contents have become quite cold. Glass, quartz, and silicated stones, require to be heated red hot, and in this state to be thrown into cold water, by which they become sufficiently friable to admit of pulverisation. Many salts which are reduced to fine powder with very great difficulty, and do not dissolve in spirit of wine, are easily obtained in a pulverulent form, by agitating their concentrated aqueous solution with a considerable quantity of rectified spirit; the disengaged fine crystallised powder may then be dried, and further divided by trituration. Potassio-tartrate of antimony may be advantageously thus treated. A large number of salts, including nitre, sal ammoniac, and carbonate of potash, may also be reduced to powder by keeping their solutions in a state of constant and violent agitation during their rapid evaporation.

The following rules should be observed in the preparation of powders:—

1. If possible, perfectly dry articles should alone be operated on, and only in dry weather.

2. The nature of the mortar, and the mode of operating, should be adapted to the nature of the substance. Thus, woods and barks should be pulverised in an iron mortar; sugar, alum, and nitre, in one of marble or wedgwood-ware; and corrosive sublimate, only in one of glass.

3. The mortar should be provided with a cover, to prevent loss and annoyance to the operator. If much powder escapes, or if it is dangerous or disagreeable when breathed, or if the substance is rare or costly, the mortar should be covered with a skin of leather, to which the pestle is attached, so that the latter may be freely moved without causing the slightest opening for the escape of the dust occasioned by the process. When aloes or gamboge is powdered, a few drops of olive oil are commonly added, with the same intention.

4. The pulverised portions should be separated from time to time, by aid of a sieve, the coarser particles being returned to the mortar to be again beaten and triturated; and this alternate pulverisation and sifting is to be repeated until the process is complete.

PUM'ICE STONE. *Syn.* Pumex, Lapis pumiceus, L. pumicis, L. Found in the neighbourhood of volcanoes. *Used*, in the solid form, to polish wood, paint, &c.; also, when pulverised, as a polishing powder for glass, bone, ivory, marble, metals, &c.

PUNCH. An acidulous, intoxicating beverage, composed of water sweetened with sugar, with a mixture of lemon juice and spirit, to which some aromatic, as nutmeg, mace, or cinnamon, is occasionally added. Wine is sometimes substituted for spirit. It is much less drunk than formerly. Rum punch is the most popular amongst sailors, who are now the principal consumers of this beverage.

Prep. 1. Juice of 3 or 4 lemons; yellow peel of 1 lemon; lump sugar, ¾ lb.; boiling water, 3½ pints; infuse ½ an hour, strain, and add, of bitter ale, ½ pint; rum and brandy, of each, ¾ to 1 pint (or rum alone, 1½ to 2 pints). More hot water and sugar may be added if the punch is desired either weaker or sweeter.

2. (Cold punch.) From arrack, port wine, and water, of each, 1 pint; juice of 4 lemons; white sugar, 1 lb.

3. (Gin punch.) From the yellow peel of ½ a lemon; juice of 1 lemon; strongest gin, ¾ pint; water, 1¾ pint; sherry, 1 glassful.

4. (Iced punch.) From champagne or Rhenish wine, 1 quart; arrack, 1 pint; juice of 6 lemons; yellow peel of 3 lemons; white sugar, 1 lb.; soda water, 1 or 2 bottles; to be iced as cream.

5. (Milk punch; Verder.) Steep the yellow rinds of 18 lemons and 6 oranges, for 2 days, in rum or brandy, 2 quarts; then add, 3 quarts more of either spirit; hot water, 3 quarts; lemon juice, 1 quart; loaf sugar, 4 lbs.; 2 nutmegs, grated; and boiling milk, 2 quarts; mix well, and in 2 hours strain the liquor through a jelly-bag.

6. (Norfolk punch.) Take of French brandy, 20 quarts; yellow peels of 18 oranges and 30 lemons; infuse for 12 hours; add, of cold water, 30 quarts; lump sugar, 20 lbs.; and the juice of the oranges and lemons; mix well, strain through a hair sieve, add of new milk, 2 quarts, and in 6 weeks bottle it. Keeps well.

7. (Orange punch.) As No. 1, using oranges, and adding some orange wine, if at hand. A little curaçoa, noyau, or mareschino, improves it.

8. (Raspberry punch.) As the last, but using raspberry juice, or raspberry vinegar, for the oranges or lemons.

9. (Regent's punch.) From strong hot green tea, lemon juice, and capillaire, of each, 1½ pint; rum, brandy, arrack, and curaçoa, of each, 1 pint; champagne, 1 bottle; mix, and slice a pineapple into it.

10. (Tea punch.) From strong hot tea, 1 quart; arrack, ½ bottle; white sugar, 6 oz.; juice of 8 lemons; and the yellow rinds of 4 lemons; mixed together.

11. (Wine punch.) From white sugar, 1 lb.; yellow peel of 3 lemons; juice of 9 lemons; arrack, 1 pint; port or sherry (hot), 1 gal.; cinnamon, ½ oz.; nutmeg, 1 dr.; mix.

12. (Yankee punch.) Macerate sliced pineapple, 3 oz.; vanilla, 6 grs.; and ambergris (rubbed with a little sugar), 1 gr., in the strongest pale brandy, 1 pint, for a few hours, with frequent agitation; then strain with expression; add, of lemon juice, 1 pint; lemon syrup, and either claret or port wine, of each, 1 bottle; with sugar, ½ lb., dissolved in boiling water, 1½ pint. See Shrub.

PURG'ATIVES. *Syn.* Dejectoria, Purgantia, Purgativa, L. These have been divided into five orders or classes, according to their particular actions. The following are the principal of each class:—

1. (LAXATIVES, LENITIVES, OR MILD CATHARTICS.) Manna, cassia pulp, tamarinds, prunes, honey, phosphate of soda; castor, almond, and olive oils; ripe fruit.

2. (SALINE OR COOLING LAXATIVES.) Epsom salt, Glauber's salt, phosphate of soda (tasteless salt), seidlitz powders, &c.

3. (ACTIVE CATHARTICS, occasionally acrid, frequently tonic and stomachic.) Rhubarb, senna, aloes, &c.

4. (DRASTIC OR VIOLENT CATHARTICS.) Jalap, scammony, gamboge, croton oil, colocynth, elaterium, &c.

5. (MERCURIAL PURGATIVES.) Calomel, blue-pill, quicksilver with chalk, &c.

In prescribing purgatives, regard should be had to the particular portion of the alimentary canal on which we desire more immediately to act, as well as to the manner in which the medicine effects its purpose. Thus, Epsom salt, sulphate of potassa, and rhubarb, act chiefly on the duodenum; aloes, on the rectum; blue pill, calomel, and jalap, on the larger intestines generally; and tartrate and bitartrate of potassa, and sulphur, on the whole length of the intestinal canal. Again, others are stimulant, as aloes, croton oil, jalap, scammony, &c.; others are refrigerant, as most of the saline aperients; magnesia and its carbonate are both aperient and antacid; whilst another class, including rhubarb, damask roses, &c., are astringent. Further, some produce only serous or watery dejections, without greatly increasing the peristaltic action of the bowels; whilst a few occasion a copious discharge of the fæces in an apparently natural form. See DRAUGHT, MIXTURE, PILLS, PRESCRIBING, &c.

PURL. *Prep.* To ale or beer, ½ pint, gently warmed, add of bitters, 1 wine-glassful, or q. s. Some add a little spirit. A favourite beverage with hard drinkers early in the morning.

PUR'PLE. A rich compound colour, produced by the admixture of pure blue and pure red. This colour has always been the distinguishing badge of royalty and distinction. The celebrated Tyrian purple was produced from a shell-fish called murex.

Purple, An'iline. *Syn.* PERKIN'S PURPLE, MAUVE. This valuable dye-stuff is prepared under W. H. Perkin's patent, by mixing solutions of sulphate of aniline and bichromate of potassa in equivalent proportions, and, after some hours, washing the black precipitate with water, drying it, digesting it repeatedly in coal-tar naphtha, and, finally, dissolving it in boiling alcohol. It may be further purified by evaporating the alcoholic solution to dryness, dissolving the residue in a large quantity of boiling water, reprecipitating by caustic soda, washing with water, dissolving in alcohol, filtering, and evaporating to dryness. Thus purified, mauve forms a brittle substance, having a bronze-coloured surface. It imparts a deep purple colour to cold water, though dissolving sparingly in that liquid; it is more soluble in hot water, and very soluble in alcohol. See PURPLE DYE (*below*), and TAR COLOURS.

Purple of Cassius. *Syn.* PURPLE PRECIPITATE OF CASSIUS, GOLD PURPLE, GOLD PREPARED WITH TIN; AURUM STANNO PARATUM, PURPURA MINERALIS CASSII, L. *Prep.* 1. Crystallised protochloride of tin, 1 part; crystallised perchloride of tin, 2 parts; dissolve each separately, mix the solutions, and add of crystallised terchloride of gold (in solution), 1 part; carefully wash, and dry the precipitate. Very fine.

2. (Frick.) Dissolve pure grain tin in cold dilute aqua regia, until the fluid becomes faintly opalescent, then take the metal out and weigh it; next, dilute the solution largely with water, and add, simultaneously, a dilute solution of gold and dilute sulphuric acid in such proportion that the tin in the one shall be to the gold in the other in the ratio of 10 to 36.

3. (P. Cod.) Terchloride of gold, 1 part, is dissolved in distilled water, 200 parts; another solution is made by dissolving, in the cold, pure tin, 1 part, in a mixture of nitric acid, 1 part, and hydrochloric acid, 2 parts; this last solution is diluted with distilled water, 100 parts, and is then added to the solution of terchloride of gold until precipitation ceases to take place; the powder is, lastly, washed by decantation, and dried by a very gentle heat.

4. Silver, 150 parts; gold, 20 parts; pure grain tin, 35 parts; fuse them together under charcoal and borax, cool, laminate, and dissolve out the silver with nitric acid.

Obs. Purple of Cassius is generally supposed to be a combination of oxide of gold and sesquioxide of tin, in which the latter acts as an acid. Heat resolves it into a mixture of metallic gold and binoxide of tin. It is used as a purple in porcelain painting, and to communicate a ruby red colour to glass, when melted in open vessels.

PURPLE DYE. The purples now in vogue are the numerous shades of 'mauve' and 'magenta' obtained by the 'aniline colours.' (See *above*, also RED.) For silk and woollen goods, no mordant is required. The proper proportion of the clear alcoholic solution is mixed with water slightly warm, any scum that may form is cleared off, and the goods are entered and worked until the required shade is obtained; a small quantity of acetic or tartaric acid is recommended to be added in some cases. For dyeing on cotton with the aniline colours, the cloth or yarn is steeped in sumac or tannic acid, dyed in the colour, and then fixed by tin; or it may be steeped in sumac and mordanted with tin, and then dyed. Purples were formerly, and are still occasionally, produced, by first dyeing a blue in the 'indigo vat,' and then dyeing a cochineal or lac scarlet upon the top. See VIOLET DYE.

PUR'PURATE OF AMMO''NIA. See MUREXIDE.

PURPU'RIC ACID. See MUREXAN.

PUR'PURIN. $C_9H_6O_3$. *Syn.* MADDER PURPLE. The name given by Robiquet and Colin to a beautiful colouring principle obtained from madder.

Prep. Coarsely powdered madder is allowed to ferment with water, after which it is boiled in a strong solution of alum; the decoction is next mixed with sulphuric acid, and the resulting red precipitate is purified by one or more crystallisations from alcohol.

Prop., &c. Crystalline red needles, insoluble in cold water, but soluble in hot water, and in alcohol, ether, and solutions of alum and the alkalies. It differs from alizarin or madder red in containing 2 atoms less of carbon.

PUR'REE. *Syn.* INDIAN YELLOW. A yellow substance, of doubtful origin, imported from China and India, and now extensively used in both oil and water-colour painting. According to the researches of Stenhouse and Erdmann, it consists of purreic acid, a strongly tinctorial vegetable substance, united to magnesia.

PURRE'IC ACID. *Syn.* EUXANTHIC ACID. This substance is obtained from purree. It crystallises in nearly colourless needles, which are only sparingly soluble in cold water, and forms rich yellow-coloured compounds with the alkalies and earths. Heat converts it into a neutral, crystallisable substance, called purrenone.

PUS. The cream-like, white or yellowish liquid secreted by wounded surfaces, abscesses, sores, &c.

PUTREFAC'TION. *Syn.* PUTREFACTIO, L. The spontaneous decomposition of animal and nitrogenised vegetable substances, under the joint influence of warmth, air, and moisture. The solid and fluid matters are resolved into gaseous compounds and vapours, which escape, and into earthy matters, which remain. The most striking characteristic of this species of decomposition is the ammoniacal or fetid exhalations that constantly accompany it.

The nature of putrefaction, and the conditions essential to its occurrence, have been briefly alluded to under FERMENTATION, to which we must refer the reader. It may here, however, be useful to reiterate that this change can only be prevented by the abstraction or exclusion of the conditions essential to its occurrence. This may be effected by—reduction of temperature,—exclusion of atmospheric air, or—the abstraction of moisture. The antiseptic processes in common use are effective in precisely the same degree as these preventive means are carried out. Frozen meat may be preserved for an unlimited period, while the same substance will scarcely keep for more than a few days at the ordinary heat of summer. Animal substances will also remain uninjured for a long period if kept in vessels from which the air is entirely excluded, as in the process now so extensively adopted for the preservation of fresh meat for the use of our army and marine. The third condition is fulfilled when nitrogenised matter is preserved in alcohol, brine, or any similar fluid, and when it is dried. In either case water is abstracted from the surface, which then loses its propensity to putrefy, and forms an impervious layer, which excludes atmospheric oxygen from the interior and softer portion of the substance. Creasote, and most of the antiseptic salts, also act in this way.

Among special antiseptic processes are the following:—

APPLICATION OF COLD. The accession of putrefaction is prevented, and its progress arrested, by a temperature below that at which water freezes. In the colder climates of the world, butcher's meat, poultry, and even vegetables, are preserved from one season to the other in the frozen state. In North America millions are thus supplied with animal food, which, we can state, from personal experience, is often superior in flavour, tenderness, and apparent freshness, to that from the recently killed animal. In temperate climates, and in cold ones during their short summer, ice-houses and ice-safes afford a temperature sufficiently low for keeping meat fresh and sweet for an indefinite period. Substances preserved in this manner should be allowed to gradually assume their natural condition before cooking them; and on no account should they be plunged into hot water, or put before the fire, whilst in the frozen state.

BUCANING. A rude kind of drying and smoking meat, cut into thin slices, practised by hunters in the prairies and forests.

DESICCATION OR DRYING. In this way every article of food, both animal and vegetable, may be preserved, without the application of salt or other foreign matter. The proper method is to expose the substances, cut into slices or small fragments, in the sun, or in a current of warm dry air, the temperature of which should be under 140° Fahr. Articles so treated, when immersed for a short time in cold water, to allow the albumen and organic fibres to swell, and then boiled in the same water, are nearly as nutritious as fresh meat cooked in the same manner. If a higher degree of heat than 140° be employed for animal substances, they become hard and insipid. Owing to the practical difficulties in the way of applying the above process to fresh meats, it is usually employed in conjunction with either salting or smoking, and, frequently, with both of them.

EXCLUSION OF ATMOSPHERIC AIR. This is effected by the method of preserving in sugar, potting in oil, and, more particularly, by some of the patented methods noticed below. Fresh meat may be preserved for some months in that state, by keeping it in water perfectly deprived of air. In practice, some iron filings and sulphur may be placed at the bottom of the vessel, over which must be set the meat; over the whole is gently poured recently boiled water, and the vessel is at once closed, so as to exclude the external air.

Immersion in antiseptic liquids. One of the commonest and most effective liquids employed for this purpose is alcohol of 60 to 70%, to which a little camphor, ammonia, sal ammoniac, or common salt, is occasionally added. A cheaper and equally efficient plan is to employ a weak spirit holding a little creasote in solution. A weak solution of sulphurous acid may be substituted for alcohol. Weak solutions of alum, or carbolic acid, with or without the addition of a few grains of corrosive sublimate, or of arsenious acid, are also highly antiseptic. These are chiefly employed for anatomical specimens, &c. A solution containing only $\frac{1}{600}$th part of nitrate of silver is likewise very effective; but, from this salt being poisonous, it cannot be employed for preserving articles of food. Butcher's meat is occasionally pickled in vinegar. By immersing it for 1 hour in water holding $\frac{1}{100}$th part of creasote in solution, it may be preserved unchanged for some time, even during summer.

Injection of antiseptic liquids into the veins or arteries of the recently killed animal. It is found that the sooner this is done after the slaughter of the animal the more effective it becomes, as the absorbent power of the vessels rapidly decrease by age. See Gannal's process (*below*.)

Jerking is a method of preserving flesh sometimes adopted in hot climates. It consists in cutting the lean parts of the meat into thin slices, and exposing these to the sunshine until quite dry and brittle, when they are bruised in a mortar, and pressed into pots.

Pickling in vinegar. In this method the substances, rendered as dry as possible by exposure to the air, are placed in glass or stoneware jars (not salt-glazed), or wooden vessels, when strong vinegar, either cold or boiling hot, is poured over them, and the vessel at once closely corked, or otherwise covered up, and preserved in a cool situation. Meat is occasionally thus treated; vegetables frequently so. See Pickle.

Potting in oil. In this case salad or olive oil is substituted for vinegar (see *above*), and is always used cold.

Salting acts chiefly by abstracting water from the albuminous portions of the meat, by which its disposition to change is lessened.

Smoking. This process, which, as well as the last, is referred to further on, acts both by the abstraction of moisture and the antiseptic properties of certain substances (creasote, &c.) contained in wood smoke. Fresh meat and fish are occasionally smoked; but, in general, substances intended to be thus treated are first salted.

In Donkin and Gamble's patent process, the substances, previously parboiled, are placed in small tin cylinders, which are then filled up with rich soup; the lids are next soldered on quite air-tight, and a small hole is afterwards made in the centre; the cylinders are then placed in a bath of strong brine, or a strong solution of chloride of calcium, which is at once heated to the boiling-point, to nearly complete the cooking process; after which the small hole in the lid is hermetically sealed, by covering it with solder while the vessel still remains boiling hot; the tins are, lastly, again submitted to heat in the heated bath, the duration of which is proportioned to the quantity and character of their contents, the 'dressing' of which is to be perfected by this operation. The ends of the tins, on cooling, assume a concave form, from the pressure of the atmosphere, without which they cannot be air-tight, and the process has been unsuccessful. To determine this, the patentees expose the canisters, prepared as before, for at least a month, in an apartment heated to about 100° Fahr.; when, if the process has failed, putrefaction commences, and the ends of the cases, instead of remaining concave, bulge, or become convex. This is called the 'test.' By this process, which was invented by M. Appert in France, about the year 1808, fish, flesh, poultry, and vegetables, may be preserved for years, in any climate.

Goldner's process differs somewhat from the preceding, in the employment of a higher degree of heat, more hastily applied, and not prolonged or repeated after the tins are soldered up.

Gannal's process, having for its object the preservation of butcher's meat in the fresh state, depends on the peculiar absorbent property of the flesh of recently killed animals, above referred to. This process consists in injecting a solution of sulphate of alumina, or, better, of chloride of aluminium, of the sp. gr. 1·070 to 1·085 (10° to 12° Baumé), into the carotid artery, by means of a syphon, as soon as the blood ceases to flow from the slaughtered animal; both extremities of the jugular vein being previously tied. 9 to 12 quarts of the solution are sufficient for an ox, and a proportionate quantity for smaller animals. A less quantity is also required in winter than summer. When the animal has been well bled, and the injection skilfully performed, it is scarcely perceptible that the animal has undergone any preparation. The injected animal is cut up in the usual way; and when intended to be eaten within 2 or 3 weeks merely requires to be hung up in a dry, airy situation, free from flies; but if it is to be kept for a longer period, it is directed to be washed with a mixed solution of common salt and chloride of aluminium at 10° Baumé, and then simply dried and packed in clean air-tight barrels, and kept in a cool, dry place. If the air cannot be perfectly excluded, it should be packed in dry salt, not for the purpose of preserving it, but to prevent the vegetation of bissus, as, without this precaution, the meat becomes musty from exposure and the action of moisture. Meat preserved by this process may be kept for several years, and merely requires soaking for 24 hours in water, for the purpose of swelling its pores, to give it the appearance and taste of fresh meat, fit for either roasting or boiling. For hot climates a somewhat stronger solution, or a larger quantity of the usual one, may be injected. The use of the strong solutions ordered in some recent works, however, deprives the flesh of a portion of its apparent freshness, and makes it more nearly approach in flavour to that which has been slightly salted in the ordinary manner.

In addition to the above, it may be added that both flesh and fish may be preserved by dipping them into, or brushing them over with, pyroligneous acid, and then drying them. This gives them a smoky flavour; but if pure acetic acid (Ph. L.) be used, no taste will be imparted. These fluids may be applied by means of a clean painter's brush, or even a stiff feather. A table-spoonful is sufficient to brush over a large surface. Fish and flesh so prepared will bear a voyage to the East Indies, and back, uninjured.

Fish may also be preserved in a dry state, and perfectly fresh, by means of sugar alone. Fresh fish may be thus kept for some days, so as to be as good when boiled as if just caught. If dried and kept free from mouldiness, there seems no limit to their preservation; and they are much more nutritious in this way than when salted. This process is particularly valuable in making what is called 'kippered salmon;' and the fish preserved in this manner are far superior in quality and flavour to those which are salted or smoked. A few tablespoonfuls of brown sugar are sufficient for a salmon of five or six pounds' weight; and if salt be desired, a teaspoonful or two may be added. Saltpetre may be used, instead of salt, if it be wished to make the kipper hard.

The well-known property possessed by ether, alcohol, pyroxylic spirit, chloroform, and certain other hydrocarbons, of averting putrefaction, has been thus applied by M. Robin:—He encloses the meat or other substances to be preserved in a glass case, along with a sponge or a capsule containing the preservative liquid, which latter is continually evolved in a vaporous condition, and exercises the preservative agency. In this way the vapours of hydrocyanic acid are found to be very efficacious. Camphor is thus employed in the MUMMY CASES in the British Museum.

It has been asserted by Mr. George Hamilton, that in an atmosphere of binoxide of nitrogen, in the dark, flesh preserves its natural colour and freshness for about 5 months; and eats well, provided it be boiled in open vessels, to expel nitrous fumes. See ANIMAL SUBSTANCES, CANDYING, EGG, FISH, FRUIT, MILK, PICKLES, POTTING, PRESERVES, SALTING, SMOKING, STUFFING, VEGETABLE SUBSTANCES, &c.

PUT'TY. This name is given to the following preparations (when used alone, 'Glazier's putty' is generally indicated):—

Glazier's Putty. From whiting made into a stiff paste with drying oil. It is used to fix panes of glass in sashes, to fill holes and cracks in wood before painting it, &c.

Plasterer's Putty. A fine cement used by plasterers, made of lime only. It differs from 'FINE STUFF' in the absence of hair.

Polisher's Putty. *Syn.* PUTTY POWDER, CALCINE; CINERES STANNI, STANNI OXYDUM CRUDUM, L. A crude peroxide of tin, obtained by exposing metallic tin in a reverberatory furnace, and raking off the dross, as it forms; this is afterwards calcined until it becomes whitish, and is then reduced to powder. Another method is to melt tin with rather more than an equal weight of lead, and then to rapidly raise the heat so as to render the mixed metal red hot, when the tin will be immediately flung out in the state of 'putty' or 'peroxide.' The products of both these processes are very hard, and are used for polishing glass and japan work, and to colour opaque white enamel. See TIN.

PUZZOLA'NA, PUOZZOLANA, or, more correctly, PUZZUOLANA, is a volcanic ash, found at Puzzuoli, near Naples. When mixed with lime, it forms an excellent hydraulic cement. A good FACTITIOUS PUZZOLANA may be made by heating a mixture of 3 bushels of clay and 1 bushel of fresh-slaked lime, for some hours, to redness. (M. Bruyere.) See CEMENT and MORTAR.

PYRI'TES. A term applied to several native metallic sulphides. IRON PYRITES is the best known of these.

PY'RO-. The term is applied to several acids that are obtained by the action of heat on other substances; as, PYROGALLIC ACID, PYROLIGNEOUS A., &c.

PYROACE'TIC SPIRIT. See SPIRIT (Pyroacetic).

PYROGAL'LIC ACID. $HC_6H_5O_3$. *Syn.* ACIDUM PYROGALLICUM, L. *Prep.* 1. From either gallic or tannic acid, heated in a retort, by means of an oil bath, and steadily maintained at a temperature of about 420° Fahr. as long as crystals are formed in the neck of the retort, or in the receiver, both of which should be kept well cooled. Pure. If a much higher heat is employed, the product consists chiefly of metagallic acid.

2. From Aleppo galls, in very coarse powder, heated in a dish covered with thin filtering paper pasted to its edge, and connected with a well-cooled receiver. Dr. Ure says that the so-called Chinese galls furnish, by dry distillation, a "very concentrated solution of pyrogallic acid, which, evaporated on the water bath, yields of brown crystalline

pyrogallic acid nearly 15% of the weight of the galls."

3. (Dr. Stenhouse.) By sublimation from the dry aqueous extract of nut-galls, in a Mohr's apparatus, in the same way that benzoic acid is obtained from benzoin resin (see *page* 208), observing the precautions referred to in No. 1 (*above*). Nearly pure. The product is fully 10% of the weight of extract operated on.

Prop. Light crystals, which, when perfectly pure, are quite white; freely soluble in water, but the solution cannot be evaporated without turning black and suffering decomposition; it strikes a rich blackish-blue colour with the protosalts of iron, and reduces those of the sesquioxide to the state of protoxide; when heated to 480° Fahr., it is converted into METAGALLIC ACID and water.

Uses, &c. Pure pyrogallic acid is now very extensively employed in photography. A solution of the crude acid mixed with a little spirit is used to dye the hair, to which it imparts a fine brown colour, but has the disadvantage of also staining the skin when applied to it.

PY'ROGEN ACIDS. Those generated by heat.

PYRO'LA. See WINTER GREEN.

PYROLIG'NEOUS ACID. *Syn.* VINEGAR OF WOOD†, SPIRIT OF W.†, SMOKING LIQUOR†, ESSENCE OF SMOKE†; ACIDUM PYROLIGNOSUM, L. Impure acetic acid, obtained by the destructive distillation of wood in close vessels. It comes over along with tar, creasote, and other liquid and gaseous matters. In this state it contains much empyreumatic matter in solution; but by separation from the tar, saturation with slaked lime or chalk, defecation, and evaporation, an impure acetate of pyrolignate of lime is obtained, which, after being gently heated, to destroy part of its empyreumatic matter, without injuring its acetic acid, is again dissolved and defecated, and then precipitated by a solution of sulphate of soda, when a solution of acetate of soda and a precipitate of sulphate of lime are formed by double decomposition. The solution is next evaporated to dryness, the dry mass (pyrolignite of soda) dissolved in water, and the new solution filtered and recrystallised. The crystals of acetate of soda, obtained by the last process, yield nearly pure acetic acid by distillation along with sulphuric acid. See ACETIC ACID and VINEGAR.

PYROLIG'NEOUS SPIRIT. See SPIRIT (Pyroxilic).

PYROM'ETER. An instrument to measure high degrees of heat. WEDGWOOD'S PYROMETER, the one best known, depends on the property which clay possesses of contracting when strongly heated. PROF. DANIEL'S PYROMETER consists, essentially, of a small rod or bar of platinum, which acts in a precisely opposite manner to the preceding, viz., by its expansion.

PYROPH'ORUS. *Syn.* LUFT-ZUNDER, Ger. Any substance that inflames spontaneously when exposed to the air.

Prep. 1. Neutral chromate of lead, 6 parts; sulphur, 1 part; triturate them with water, q. s. to form a paste, and make this into pellets; dry these perfectly by a gentle heat, then heat them in a closed tube until the sulphur is all driven off; lastly, transfer them to a stoppered phial.

2. (HOMBERG'S PYROPHORUS.) From alum and brown sugar, equal parts; stir the mixture in an iron ladle over the fire until dry, then put it into an earthen or coated glass phial, and keep it at a red heat so long as flame is emitted; it must then be carefully stopped up and cooled.

3. (Dr. Hare.) Lampblack, 3 parts; burnt alum, 4 parts; carbonate of potassa, 8 parts; as the last.

4. (Gay Lussac.) From sulphate of potassa, 9 parts; calcined lampblack, 5 parts; as No. 2.

5. Alum, 3 parts; wheat flour, 1 part; as No. 2.

6. (LEAD PYROPHORUS—Göbel.) Heat tartrate of lead to redness in a glass tube, and then hermetically seal it. See TARTRATE OF LEAD.

Obs. When the above are properly prepared, a little of the powder rapidly becomes very hot, and inflames on exposure to the air. The accession of the combustion is promoted by moisture, as a damp atmosphere or the breath. With the exception of the first and sixth, "they owe their combustibility to the presence of sulphide of potassium." (Gay Lussac.)

PYROPHOSPHOR'IC ACID. See DIBASIC PHOSPHORIC ACID.

PYRO'SIS. *Syn.* BLACK WATER, WATER BRASH, WATER QUALM. An affection of the stomach, attended by a sensation of heat and the eructation of a thin, sour liquid, often in considerable quantity, especially in the morning. It is a variety of HEARTBURN (which *see*).

PYROTARTAR'IC ACID. $H_2C_5H_6O_4$. Obtained by the destructive distillation of tartaric acid. See TARTARIC ACID.

PYROTECH'NY. The art of making fireworks. The three principal materials employed in this art are charcoal, nitre, and sulphur, along with filings of iron, steel, copper, or zinc, or with resin, camphor, lycopodium, or other substances, to impart colour, or to modify the effect or the duration of the combustion. Gunpowder is used "either in grain, half crushed, or finely ground, for different purposes. The longer the iron filings are, the brighter red and white spots they give; those being preferred which are made with a coarse file, and quite free from rust. Steel filings and cast-iron borings contain carbon, and afford a more brilliant fire, with wavy radiations. Copper filings give a greenish tint to flame; those of zinc, a fine blue colour; the sulphide of antimony gives a less greenish blue than zinc, but with much smoke; amber affords a yellow fire, as well as colophony (resin) and common salt; but the last must be very dry. Lampblack produces a very red colour with gunpowder, and a pink one with nitre in excess; it serves for making golden showers." When this substance is lightly mixed with gunpowder and put into cases, it throws out small stars resembling the rowel of a spur; this composition has hence been called 'spur fire.' "The yellow sand, or glistening mica, communicates to fire-works golden radiations. Verdigris imparts a pale green; sulphate of copper and sal ammoniac gives a palm-tree green. Camphor yields a very white flame and aromatic fumes, which masks the bad smell of other substances. Benzoin and storax are also used, on account of their agreeable odour. Lycopodium burns with a rose colour and a magnificent flame; but it is principally employed in theatres to represent lightning, or to charge the torch of a Fury." (Ure.) See Fires (Coloured), Flame Colours, Gunpowder, Stars, Rockets, &c.

PYROXYL'IC SPIRIT. See Spirit (Pyroxylic).

PYROX'YLIN. *Syn.* Fulminating cotton, Gun-cotton. A highly inflammable and explosive compound, discovered by Schönbein. It is obtained by the action of nitric acid on cotton (cellulin, $C_6H_{10}O_5$), in the presence of sulphuric acid.

By varying the strength of the nitric acid three kinds of gun-cotton may be obtained, called respectively mononitro-cellulin $[C_6H_9(NO_2)O_5]$, dinitro-cellulin $[C_6H_8(NO_2)_2O_5]$, and trinitro-cellulin $[C_6H_7(NO_2)_3O_5]$. The first is but slightly explosive; the second is not sufficiently explosive to be used as a substitute for gunpowder, but is best adapted for the preparation of collodion; the third is highly explosive, and is the variety employed in mining and military operations, &c.

Prep. 1. (B. P., Dinitro-cellulin.) Cotton-wool, 1; sulphuric acid, 5; nitric acid, 5; mix the acids, immerse the cotton, and stir with a glass rod for three minutes, or until it is thoroughly wetted, then remove it, and thoroughly wash out the acid, so that the washings cease to produce a precipitate with chloride of barium. Drain on filtering paper, and dry in a water bath. *Used* in the preparation of Collodion.

2. Concentrated nitric acid (sp. gr. 1·500) and concentrated sulphuric acid (sp. gr. 1·845) are mixed together in about equal measures; when the mixture has become cold, it is poured into a glass or wedgwood-ware mortar or basin, and clean, dry carded cotton, in as loose a state as practicable, is immersed in it for 4 or 5 minutes, the action of the liquid being promoted by incessant stirring with a glass rod; the acid is next poured off, and the cotton, after being squeezed as dry as possible, by means of the glass stirrer, or between two plates of glass, is thrown into a large quantity of clean soft water, and again squeezed to free it from superfluous moisture; it is then washed in a stream of pure water until it becomes perfectly free from acid, and is, lastly, carefully dried by the heat of hot water or steam, at a temperature not higher than about 180° Fahr.

3. (Schönbein.) Nitric acid (1·45 to 1·50), 1 part; sulphuric acid (1·85), 3 parts; (both by volume;) proceed as above, but, after the cotton has been squeezed from the acid, allow it to remain in a covered vessel for an hour before washing it; and after washing it, dip it into a solution of carbonate of potassa, 1 oz., in pure water, 1 gal., then squeeze, and partially dry it; next dip it into a weak solution of nitre, and dry it in a room heated by hot air or steam to about 150° Fahr. (See Patent Specif.)

4. (Von Lenk.) The cotton, having been thoroughly cleansed and dried, is steeped, as above, in a mixture of nitric and sulphuric acids (the strongest obtainable in commerce), squeezed as dry as possible, and immersed in a fresh mixture of strong acids, being allowed to remain in this second mixture 48 hours. It is then washed in a stream of water for several weeks, and finally treated with a solution of silicate of potassa (soluble glass). This is the celebrated Austrian gun-cotton which was reported on so favourably by a committee of the British Association in 1863. The treatment with silicate of potassa is adopted merely for the purpose of retarding the combustion.

5. ('Bulletin de St. Pétersbourg.')—*a.* Take of powdered nitre, 20 parts; sulphuric acid (1·830 to 1·835), 31 parts; dissolve in a glass vessel, and, whilst the solution is still warm (122° Fahr.), add of dry carded cotton, 1 part, and employ agitation until this last is well saturated; then cover over the vessel with a plate of glass, and let it stand, for 24 hours, at a temperature of about 86° Fahr.; next well wash the cotton, as above, first with cold and afterwards with boiling water, and dry it carefully at a very low temperature.

b. From sulphuric acid (containing 3 equiv. of water), 13 parts; nitric acid (monohydrated), 12 parts; carded cotton, 1 part; the immersion being limited to one hour at a temperature of from 104° to 122° Fahr. (See 'Pharm. Journ.,' vol. xiii, No. 2.)

Prop., &c. Pyroxylin explodes, with a very sudden flash, and the development of very little heat, without either smoke or residue, at a temperature of about 300° Fahr. (No. 3 at 277° Fahr.). Several modifications of pyroxylin are known, varying considerably in composition, though they all contain the elements of hyponitric acid, and are all explosive. Some are insoluble in a mixture of ether and alcohol, whilst others are readily dissolved, forming the glutinous solution which is used in surgery under the name of 'collodion,' and which is also extensively used in photography. The best gun-cotton (Von Lenk's) is of no use whatever for making collodion. The pyroxylin prepared by the formula 5, *a* (*above*), is soluble in a mixture of 7 parts of ether and 1 part of alcohol; whilst the product of 5, *b*, if prepared by 2 hours' digestion instead of 1, is said to be even soluble in absolute alcohol.

Obs. General von Lenk has overcome all the difficulties which have hitherto prevented gun-cotton being used in place of gunpowder. By spinning the gun-cotton into thread or yarn, and weaving this into webs, he has succeeded in making cartridges which will produce the exact amount of force required. The time needed for the complete ignition of the cartridge can be diminished or increased at pleasure by varying the mechanical arrangement of the spun threads. Each gun and each kind of projectile requires a certain density of cartridge. In general, it is found that the proportion of 11 lbs. of gun-cotton occupying 1 cubic foot of space produces a greater force than gunpowder of which from 50 to 60 lbs. occupies the same space, and a force of the nature required for ordinary artillery. See Collodion and Xyloidin; consult also Abel's researches in the 'Transactions of the Royal Society.'

QUACK MED'ICINES. See Patent Medicines, Ointment, Pills, &c.

QUAIL. The *Coturnix vulgaris*, a gallinaceous bird, allied to the partridge, but of smaller size. Its flesh is highly esteemed by epicures. It is imported from Turkey, preserved in oil; and from Italy, potted with clarified butter.

QUAR'TAN. Occurring every fourth day.

QUARTA'TION. The practice, among assayers, of alloying 1 part of gold with 3 parts of silver, before submitting it to the operation of 'parting;' in order that its particles may be too far separated to protect the copper, lead, palladium, silver, or other metals, with which it is contaminated, from the solvent action of the nitric or sulphuric acid, as the case may be. See Assaying.

QUARTZ. Pure native silica. It is an essential constituent of granite and many other rocks. Its crystalline, transparent varieties are known as rock crystal. See Glass, Powder, &c.

QUASS. *Syn.* Posca venalis, L. *Prep.* Mix rye-flour and warm water together, and keep the mixture by the fireside until it has turned sour. *Used* as vinegar in Russia.

QUAS'SIA. *Syn.* Quassia (Ph. L. E. & D.; Quassia lignum, Quassia wood, B. P.) The "wood of *Picræna* (*Picrasma*) *excelsa*, Lindl." (B. P., Ph. L.), or *Jamaica quassia*; and also of the "*Quassia amara*, Linn." (Ph. E.), or *Surinam quassia*. The latter is the original quassia, but it is no longer imported. Quassia is characterised by its intense bitterness. It is reputed tonic and stomachic, assisting digestion, and giving tone and vigour to the system. Its name was given to it by Linnæus, in honour of a negro slave who had long employed it as a remedy for the malignant endemic fevers of Surinam. When sliced, it forms the 'quassia chips' of the shops. It is generally taken in the form of infusion. This last, sweetened with sugar, forms a safe and effective poison for flies.—*Dose.* (In powder) 10 to 20 grs.

Roasted quassia, reduced to powder, is largely employed, instead of hops, to embitter porter; and the unroasted powder is used for the same purpose in the adulteration of the bitter varieties of ale.

QUAS'SIN. *Syn.* Quassite, Quassina. A peculiar bitter principle, obtained by precipitating decoction of quassia with milk of lime, evaporating the filtrate, dissolving the residue in alcohol, treating with animal charcoal, again evaporating, dissolving in water, and crystallising. 8 lbs. of quassia chips yield 1 drachm.

QUEEN'S BLUE. Thumb blue. See Blue.

QUEEN'S MET'AL. A species of pewter used for teapots, &c., made by fusing under charcoal a mixture of tin, 9 parts, and antimony, bismuth, and lead, of each, 1 part; or, tin, 100 parts; antimony, 8 parts; copper, 4 parts; bismuth, 1 part. See Britannia Metal and Pewter.

QUEEN'S YEL'LOW. Subsulphate of mercury.

QUER'CITRON. The bark of *Quercus nigra* or *tinctoria*, a species of oak indigenous in North America. With alum mordants it yields a very permanent yellow dye.

QUICK'SILVER. See Mercury.

QUILLS. *Prep.* 1. The quills or wing-feathers of the goose (goose quills) are separately plunged, for a few seconds, into hot ashes, cinders, or sand, of a temperature about equal to that of boiling water, after which they are scraped with a blunt knife, strongly rubbed with a piece of flannel or woollen cloth, and gently 'stoved;' they are, lastly, tied up in bundles by women or children. A yellow tinge is often given to them by dipping them for a short time into dilute hydrochloric or nitric acid, or into an infusion of turmeric.

2. Suspend the quills in a copper over water sufficiently high to nearly touch the nibs; then close it steam tight, and apply three or four hours' hard boiling; next, withdraw the quills, and dry them, and in 24 hours cut the nibs and draw out the pith; lastly, rub them with a piece of cloth, and expose them to a moderate heat in an oven or stove. Quills prepared in this way are as hard as bone, without being brittle, and nearly as transparent as glass. Crow quills and swan quills may be cured in the same manner.

QUI'NA. See Quinine.

QUINCE. *Syn.* Cydonia, L. The fruit of *Cydonia vulgaris*, or common quince tree. Its flavour in the raw state is austere, but it forms an excellent marmalade (quince marmalade), and its juice yields an agreeable and wholesome wine. The seed or pips (cydoniæ seminæ; cydonium—Ph. L.) abound in gummy matter, which forms a mucilage with water, and possesses the advantage of not being affected by the salts of iron or alcohol. See DECOCTION, FIXATURE, and JELLY.

QUINICINE. An alkaloid obtained in 1853 by Pasteur, by exposing quinine or quinidine, under favourable circumstances, to a temperature varying from 248° to 266° Fahr., for several hours. It is very probable that this alkaloid is either identical, or in very close connection, with the amorphous alkaloid soluble in ether which occurs in all barks, and particularly in the young barks of the plantations in India.

QUINIDINE. $C_{20}H_{24}O_2N_2.2Aq$. *Syn.* QUINIDIA, CONCHININE, &c. An alkaloid contained in many species of cinchona, together with quinine and cinchonine, and therefore often found in the mother-liquors of quinine manufacturers. It is identical with the β quinine of Van Heyningen, and was discovered, in 1833, by Henry and Delondre. As the cinchonidine discovered by Winckler, in 1848, has been unhappily denominated quinidine by this chemist, there is still a confusion about these alkaloids, and, therefore, the quinidine of commerce was very often a mixture of both, till Pasteur made, in 1853, a classical investigation of this matter. He maintained the name of quinidine for the alkaloid discovered by Henry and Delondre, because it is isomeric with quinine, and gives the same green colour when treated with chlorine followed by ammonia, and gave the name of cinchonidine to the alkaloid discovered by Winckler, because it is isomeric with cinchonine. He determined also the action of the solutions of these alkaloids on the plane of polarization, and found that the quinidine turned this plane to the right, its molecular rotation in alcoholic solution being $[a] = 250{\cdot}75° \ggg\!\longrightarrow$, whilst he found that the cinchonidine turned this plane to the left, its molecular rotation in alcoholic solution being $[a] = 144{\cdot}61° \longleftarrow\!\lll$.

Prop. &c. Many of the salts of quinidine are very similar to those of quinine, but the normal salt with hydriodic acid is not only very different from that of quinine, but also from those of all the other cinchona-alkaloids. The normal hydriodate of quinidine is so very sparingly soluble in water that 1 part requires, at 60° Fahr., not less than 1200 parts of water to be dissolved. Therefore the presence of sulphate of quinidine in the sulphate of quinine, which often occurs, either from that article being carelessly made or from wilful adulteration, can be easily detected by adding a few minims of solution of iodide of potassium to the saturated solution of sulphate of quinine in water of 60° Fahr., whereby, if quinidine is present, its hydriodate will be separated either in the shape of a sandy precipitate or, if only traces are present, in the shape of striæ on the sides of the glass where this has been rubbed by a glass rod.

For an account of its medicinal properties, the reader should consult the recent report from India upon the experiments made there by order of Government with all the four cinchona-alkaloids, which experiments are very favourable to the therapeutical action of quinidine compared with that of quinine.

QUININE. $C_{10}H_{12}ON$. *Syn.* QUINA, QUINIA. Till recently it was found in the greatest quantity in good Calisaya bark, particularly in that from Bolivia, but since it has been found in great quantity in some other barks, especially in the bark of *Cinchona officinalis*, for instance in the bark of that species grown in Ceylon. Red bark contains not only quinine and cinchonine, but also cinchonidine.

Prep. 1. By precipitating a solution of sulphate of quinine with a *slight* excess of ammonia, potassa, or soda, and washing and drying the precipitate. By solution in alcohol, sp. gr. ·815, and spontaneous evaporation, it may be procured in crystals. Crystals may also be obtained from "its solution in hot water with a little ammonia." (Liebig.)

2. (Direct.) By adding hydrate of lime, in slight excess, to a strong decoction of the ground bark made with water acidulated with sulphuric acid, washing the precipitate which ensues, and boiling it in alcohol; the solution, filtered while hot, deposits the alkaloid on cooling.

Prop., &c. Quinine, when prepared by precipitation, is an amorphous white powder, but when this precipitate is left in the liquor it assumes, after some time, the appearance of aggregated crystalline needles; when slowly crystallised from its solution, these needles are remarkably fine, and of a pearly or silky lustre. It is freely soluble in rectified spirit and in ether, and of all the cinchona-alkaloids it is the most soluble in ammonia. It is upon this fact that Kerner's method for testing the purity of sulphate of quinine is founded. Its normal salts, if dissolved in water, have a slightly alkaline reaction upon red litmus paper. It is only sparingly soluble in water, even when boiling; both the fixed and volatile oils dissolve it with the aid of heat, more especially when it has been rendered anhydrous, or is presented to them under the form of an ethereal solution. It fuses by a gentle heat, without decomposition; forms crystallisable salts, which are only slightly soluble in water, unless it be acidulated, and, like the pure alkaloid, are extremely bitter, and possess much of the characteristic flavour of cinchona bark. It is precipitated by the alkalies and their carbonates, by tannic acid, and by most astringent substances.

Pur. See SULPHATE OF QUININE, and QUINOMETRY (*below*).

Tests. Quinine is recognised by—1. Its appearance under the microscope.—2. Its solubility in ether, and in pure ammonia water.—3. Its solubility in concentrated nitric acid, forming a colourless liquid, which does not become yellowish until it is heated.—4. The solubility of itself and salts, when pure, in concentrated sulphuric acid, forming colourless fluids, "which do not acquire any coloration upon being heated to the point of incipient evaporation of the sulphuric acid, but which afterwards become yellow, and finally brown." (Fresenius.)—5. It solubility in concentrated sulphuric acid to which some nitric acid has been added, forming a colourless, or, at the most, only a faintly yellowish liquid.—6. It is wholly destroyed by heat.

A solution of quinine in acidulated water, and solutions of its salts, exhibit the following reactions:—1. Ammonia, potassa, and the alkaline carbonates, give white, pulverulent precipitates, becoming crystalline after some time (see *above*), and which are soluble in ammonia in excess, and which, when ether is added after the ammonia, and the whole is agitated, redissolve in the ether, whilst the clear liquid, on repose, presents two distinct layers.—2. Bicarbonate of soda (avoiding excess) gives a similar precipitate, both in acid and neutral solutions of quinine, either at once or after a short time. This precipitate is soluble in excess of the precipitant, and is again precipitated from the new solution upon protracted ebullition. "Vigorous stirring of the liquid promotes the separation of this precipitate." (Fresenius.)—3. If recently prepared chlorine be added to it, and then ammonia, a beautiful emerald-green colour is developed. (Ph. L.)—4. A concentrated solution of ferrocyanide of potassium being added, in excess, after the chlorine, instead of the ammonia, a dark red colour is instantly produced, which, after some time, passes into green, especially when freely exposed to the light. This reaction is not characteristic of quinine, for with quinidine one gets the same reaction.—5. If caustic potassa be used instead of ammonia (see *above*), the solution acquires a sulphur-yellow colour. "These reactions are restricted to this alkaloid." (Dr. Garrod.)

The best test, however, for quinine is the formation of its iodosulphate, the so-called herapathite. For this purpose the quinine is dissolved in 10 parts of proof spirit, acidulated with $\frac{1}{20}$th part of sulphuric acid, and to this solution an alcoholic solution of iodine is carefully added, and the liquid in the meanwhile stirred with a glass rod. There appears, either immediately or after some minutes, a black precipitate of iodosulphate of quinine, which, if redissolved in boiling proof spirit, forms in cooling the beautiful crystals of herapathite. 100 parts of this herapathite, if dried on a water bath, represent 56·5 parts of pure quinine.

Quinine is distinguished from both cinchonine and quinidine by its comparatively free solubility in ether; the last of these being very sparingly soluble, and the other wholly insoluble, in that menstruum. The presence of cinchonine may also be positively determined by reference to the behaviour of that alkaloid. Quinidine is also distingished from quinine by the different crystallisation, greater specific gravity, and freer solubility of its salts in cold water.[1]

Estim. See QUINOMETRY.

Uses, &c. Pure quinine is but rarely used in medicine, but several of its salts are employed as remedies, on account of their great stimulant, tonic, and febrifuge powers. As a tonic in dyspeptic affections, and for restoring strength and vigour to morbidly weakened habits, and as an antiperiodic or agent to counteract febrile action, it appears to be superior to all other remedies, provided no abnormal irritability of the mucous membranes, or of the circulatory organs, exists. The dose of the salts of quinine, as a tonic, is ½ to 1 gr., twice or thrice daily; as an antiperiodic, 2 to 5 grs., or even more, every second or third hour, during the intervals of the paroxysms of ague, and of other intermittent or periodic affections; also in acute rheumatism. The sulphate (disulphate) is the salt generally used; this and other salts are most effective when taken in solution.

The salts of quinine may be made by simply saturating the dilute acids with the base, so that part of the latter remains undissolved, and gently evaporating the solutions for crystals, or to dryness. Prince Lucien Bonaparte recommends all these salts to be prepared by the addition of a strong alcoholic solution of quinine to a cold solution of the acid. We have tried this method with success.

Quinine, Ac'etate of. *Syn.* QUINÆ ACETAS, L. *Prep.* 1. (P. Cod.) Mix quinine, 2 parts, with water, 3 parts; heat the mixture, and add of acetic acid, q. s. to dissolve the alkaloid, and to render the solution slightly acid; lastly, decant or filter the solution whilst boiling hot, and set it aside to crystallise. The mother-water, on evaporation, will yield a second crop of the acetate.

2. Effloresced sulphate of quinine, 17 parts, is dissolved in boiling water, and mixed with crystallised acetate of soda, 6 parts. The acetate of quinine crystallises.

Prop., &c. Satiny, acicular crystals, which are rather more soluble in water than those of the sulphate.—*Dose.* ½ to 5 grs.

Quinine, Arse"niate of. *Syn.* QUINÆ ARSENIAS, L. *Prep.* (Bourières.) Arsenic acid, 1¼ dr.; quinine, 5 drs.; distilled water, 6 fl. oz.; boil them together in a covered glass vessel until the alkaloid is dissolved, then set the solution aside to crystallise.

Uses, &c. Recommended by Dr. Neligan,

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[1] An extremely elegant and highly sensitive method of testing for quinine and quinidine by means of the microscope, &c., is described at considerable length, by Dr. Herapath, in the 'Pharm. Journ.' for November, 1853.

and others, as being more powerfully antiperiodic than the other preparations of quinine.—*Dose*. 1/12 to ¼ gr., made into pills; in agues, neuralgia, &c.; also in cancer.

Quinine, Ar'senite of. *Syn.* QUINÆ ARSENIS, L. *Prep.* Sulphate of quinine, 100 parts, is dissolved in alcohol, 600 parts, and boiled with arsenious acid, 14 parts. The liquid is then filtered. The poisonous salt is deposited in the crystalline form as the liquid cools.

Uses, &c. As the last.

Quinine, Chlo''ride of. Hydrochlorate of quinine (see *below*).

Quinine, Cit'rate of. *Syn.* QUINÆ CITRAS, L. *Prep.* 1. By mixing a hot solution of sulphate of quinine with a like solution of citrate of soda.

2. From quinine and citric acid, as the acetate. Needle-shaped prisms.—*Dose, &c.* As the sulphate or disulphate.

Quinine, Disul'phate of. Sulphate of quinine (see *below*).

Quinine, Ferrocy'anide of. *Syn.* CYANIDE OF IRON AND QUININE; QUINÆ HYDROFERROCYANAS, QUINÆ FERRO-PRUSSIAS, L. *Prep.* (P. Cod.) Sulphate of quinine, 100 parts; ferrocyanide of potassium, 31 parts; distilled water, 2500 parts; boil for a few minutes, and, when cold, separate the impure salt which floats as an oily mass on the surface, wash it with a little cold water, and dissolve it in boiling alcohol; the solution will deposit crystals as it cools.

Obs. This compound is by some said to be the most efficacious of all the salts of quinia. Pelouze asserts that it is simply quinine mixed with some Prussian blue.—*Dose.* 1 to 6 grs.

Quinine, Ferrosul'phate of. See SULPHATE OF QUININE AND IRON (*below*).

Quinine, Hydri'odate of. *Syn.* IODIDE OF QUININE; QUINÆ HYDRIODAS, Q. IODIDUM, L. *Prep.* 1. By adding, drop by drop, a concentrated solution of iodide of potassium to a like solution of acid sulphate of quinine, and drying the precipitate in the shade; or, heat the liquid nearly to the boiling-point, and allow it to crystallise.

2. (Parrish.) Effloresced sulphate of quinine, 5 parts, dissolved in alcohol, and decomposed by an alcoholic solution of 3 parts of iodide of potassium, precipitates sulphate of potassa, and yields, on cooling and evaporating, hydriodate of quinine in fine crystalline needles.[1]

3. (IODURETTED — Bouchardat.) From an acid solution of quinia and a solution of iodide of iron containing a slight excess of iron, as No. 1.

Obs. The above are reputed alterative, tonic, and antiperiodic.—*Dose.* 1 to 4 grs.; in obstinate intermittents, and in the scrofulous affections of debilitated subjects.

Quinine, Hydrochlo''rate of. *Syn.* CHLORIDE OF QUININE, MURIATE OF QUININE†; QUINÆ HYDROCHLORAS, QUINIÆ MURIAS, L. *Prep.* 1. By neutralising dilute hydrochloric acid with the base, as above.

2. (Ph. Bor.) Chloride of barium, 5 drs.; boiling water, 1 lb.; dissolve, add, gradually, of sulphate of quinine, 2 oz.; boil gently for a few minutes, filter the solution whilst hot, and set it aside that crystals may form.

3. (QUINÆ MURIAS—Ph. D.) Dissolve chloride of barium, 123 grs., in distilled water, 2 fl. oz.; add of sulphate of quinine, 1 oz., dissolved in boiling water, 1½ pint; mix, evaporate the solution to one half, filter, and again evaporate until spiculæ begin to appear; next allow the liquid to cool, collect the crystals, and dry them on bibulous paper. The mother-liquor, by further concentration and cooling, will yield an additional product.

Obs. Hydrochlorate of quinine occurs in snow-white groups of feathery crystals, of a mother-of-pearl lustre, which are more freely soluble than those of the disulphate.

Quinine, Ki'nate of. *Syn.* QUINÆ KINAS, L. *Prep.* By saturating a solution of kinic acid with quinine, and purifying by crystallisation out of alcohol. The kinate of quinine is obtained in crystalline warts, soluble in 4 parts of water and 8 parts of alcohol.

Quinine, Lac'tate of. *Syn.* QUINÆ LACTAS, L. *Prep.* As the ACETATE or CITRATE. By spontaneous evaporation fine crystals may be obtained. Said to agree better with dyspeptic patients than the other salts of quinine.

Quinine, Mu''riate of. Hydrochlorate of quinine (see *above*).

Quinine, Ni'trate of. *Syn.* QUINÆ NITRAS, L. *Prep.* As the HYDROCHLORATE, substituting dilute nitric acid, or nitrate of baryta (P. Cod.), for hydrochloric acid or chloride of barium.

Quinine, Phos'phate of. *Syn.* QUINÆ PHOSPHAS, L. As the ACETATE. Silky, needle-shaped crystals, with a pearly lustre. It has been highly recommended in intermittents, &c., associated with rickets and stomach affections.

Quinine, Sul'phates of. The salt often called 'disulphate of quinine' is now generally regarded as the normal sulphate, while the soluble salt, often called the 'neutral sulphate,' is considered to be an acid salt. This change in nomenclature results from doubling the atomic weight of the alkaloid quinine:—

1. **Quinine, Acid Sulphate of.** ($C_{20}H_{24}N_2O_2.H_2SO_4.7Aq$). *Syn.* SULPHATE OF QUININE†, NEUTRAL SULPHATE OF QUININE†, SOLUBLE S. OF Q.; QUINÆ SULPHAS SOLUBILIS, L. *Prep.* From sulphate of quinine, 1 oz., dissolved, by the aid of heat, in water, ½ pint, previously acidulated with dilute sulphuric acid, 5 fl. drs.; the solution affords crystals on cooling, and more on evaporation.

Obs. This salt possesses the advantage of being soluble in about 10 parts of water at

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[1] "1 and 2 are not identical; 1 is an acid salt which readily crystallises, but 2 is a normal salt which I never saw crystallise, but always like a fluid resin, quite amorphous."—De Vrij.

60° Fahr.; but it is seldom used in the crystalline form; still, as the officinal sulphate ('disulphate') is generally prescribed along with a small quantity of dilute sulphuric acid to render it soluble, this acid sulphate is, in fact, the compound which is commonly given. It is the 'bisulphate,' 'supersulphate,' or 'acid sulphate of quina' of Soubeiran and other Continental chemists.

2. Quinine, Sulphate of. ($(C_{20}H_{24}N_2O_2)_2.2H_2SO_4.7Aq$). *Syn.* NORMAL SULPHATE OF QUININE, DISULPHALE OF Q., QUININE; QUINÆ DISULPHAS (Ph. L.), QUINÆ SULPHAS (Ph. E., D., & U. S., & P. Cod.), QUINIÆ SULPHAS (B. P.), L.; SULPHATE DE QUININE, Fr. *Prep.* 1. (Ph. L. 1836.) Take of yellow cinchona bark, bruised, 7 lbs.; sulphuric acid, 4¼ oz.; (diluted with) water, 6 galls.; boil them for 1 hour, and strain; repeat this a second time for 1 hour, with a like quantity of acid and water, and again strain; next boil the bark for 3 hours, in water, 8 galls., and strain; wash the residue with fresh quantities of boiling distilled water; to the mixed decoctions and washings, add moist hydrated oxide of lead to saturation, decant the supernatant fluid, and wash the sediment with distilled water; boil down the liquor for 15 minutes, and strain, then precipitate the quina with liquor of ammonia, and wash the precipitate (with very cold water) until nothing alkaline is perceptible; saturate what remains with sulphuric acid, ½ oz., diluted with water, q. s., digest with animal charcoal, 2 oz., and strain; lastly, the charcoal being well washed, evaporate the mixed liquors, that crystals may form.

2. (Ph. E.) This process varies from the last one, in the bark (1 lb.) being first boiled in water (4 pints) along with carbonate of soda (4 oz.); the residuum, being pressed, is moistened with water, and again pressed, and this operation is repeated a second and a third time, the object being to remove, as much as possible, the acids, colouring matter, gum, and extractive, before proceeding to extract the alkaloid. Carbonate of soda is also used as the precipitant, instead of ammonia, and the precipitate is formed into a sulphate (disulphate) by being stirred with boiling water, 1 pint, to which sulphuric acid, 1 fl. scruple, or q. s., is subsequently added. The crystals, after digestion with prepared animal charcoal, 2 drs., are ordered to be dried at a heat not higher than 140° Fahr.

3. (Ph. D.) Yellow bark, 1 lb., is macerated for 24 hours in water, 2 quarts, acidulated with oil of vitriol, 2 fl. drs., and then boiled for half an hour, after which the fluid is decanted; this is repeated a second and a third time with water, 2 quarts, and oil of vitriol, 1 fl. dr.; the decanted (or strained) liquors are evaporated to a quart, and filtered, and slaked lime, 1 oz., or q. s., added to the solution until it exhibits a decidedly alkaline reaction; the precipitate is next collected on a calico filter, and, after having been washed with cold water, partially dried on porous bricks, and subjected to powerful pressure enveloped in blotting paper, is boiled for 20 minutes in rectified spirit, 1 pint, and the liquid, after subsidence, decanted; this is repeated a second and a third time with a fresh pint of spirit, and the residuum being well pressed, the mixed liquors are filtered, and the spirit removed by distillation; the brown viscid residuum is dissolved in boiling water, 16 fl. oz., boiled, and dilute sulphuric acid, ½ fl. oz., or q. s., added to render the solution neutral or only slightly acid; animal charcoal, ½ oz., is next stirred in, the mixture boiled for about 5 minutes, filtered, and set aside to crystallise; the crystals are dried on blotting paper, by mere exposure to a dry atmosphere.

4. (B. P.) Yellow cinchona bark, in coarse powder, 16; hydrochloric acid, 3; distilled water, a sufficiency; solution of soda, 80; dilute sulphuric acid, a sufficiency. Dilute the hydrochloric acid with ten pints of the water. Place the bark in a porcelain basin, and add to it as much of the diluted hydrochloric acid as will render it thoroughly moist. After maceration, with occasional stirring, for twenty-four hours, place the bark in a displacement apparatus, and percolate with the diluted hydrochloric acid until the solution which drops through is nearly destitute of bitter taste. Into this liquid (hydrochlorate of quinine) pour the solution of soda, agitate well, let the precipitate (quinine) completely subside, decant the supernatant fluid, collect the precipitate on a filter, and wash it with cold distilled water until the washings cease to have colour. Transfer the precipitate to a porcelain dish containing a pint of distilled water, and, applying to this the heat of a water bath, gradually add diluted sulphuric acid until *very nearly* the whole of the precipitate has been dissolved, and a neutral liquid has been obtained. (Or add about half the precipitated quinine to some water in an evaporating basin, warm the mixture and pour in diluted sulphuric acid until the precipitate has dissolved and the liquid is neutral or only faintly acid, then add the other half, stir well, and again heat liquid.) Filter the solution (sulphate of quinine), while hot, through paper, wash the filter with boiling distilled water, concentrate till a film forms on the surface of the solution, and set it aside to crystallise. The crystals should be dried on filtering paper without the application of heat.

5. "Those who are well acquainted with the chemistry of the cinchona-alkaloids all agree with me in condemning the boiling of bark with dilute acids. I prefer the following method, which can also be used on a small scale for quinometry.

"Yellow bark, or any other bark in which quinine prevails, like, for instance, that of *Cinchona officinalis*, 1 lb., is mixed with milk of lime, made from 4 oz. of lime and 40 oz. of water. After drying this mixture it is exhausted with strong methylated spirit (the strongest possible) and the slightly coloured solution neutralised with sulphuric acid, so that the liquor has a slight acid reaction upon blue litmus paper. After filtering or subsiding, the clear liquid is distilled and the residue in the still dissolved in water, carefully neutralised, so that the solution has a slight alkaline reaction upon red litmus paper, treated with charcoal and crystallised, &c."—De Vrij.

6. ('HOSPITAL SULPHATE'—Mr. E. Herring.) The crushed bark is boiled in a solution of caustic soda or potassa, to extract colouring matter and gum; it is then pressed, washed with cold water, a second time boiled with a solution of caustic alkali, and again pressed, washed, and pressed; the decoloured and purified bark is next exhausted by coction with acidulated water, in the usual way, and the filtered mixed decoctions are precipitated with carbonate of soda; the precipitated quina is then dissolved in hot dilute sulphuric acid, to saturation, when the 'HOSPITAL SULPHATE' crystallises out, as the solution cools; this is, lastly, washed with a little cold water, drained, and dried.—The advantage of this process is the non-use of animal charcoal as a bleacher, and the consequent less cost of the product. In the preparation of his 'WHITE SULPHATE,' Mr. Herring uses benzol as a solvent, instead of alcohol. *Patent* dated July 28th, 1853.

Prop. When pure, sulphate of quinine forms very light, delicate, flexible, white needles, which are efflorescent, inodorous, and intensely bitter; it is soluble in 740 parts of water at 60°, and in 30 parts at 212° Fahr.; it takes about 80 parts of cold rectified spirit for its solution, but is freely soluble in boiling alcohol, and in acidulated water; it melts at 240° Fahr., and is charred and destroyed at a heat below that of redness. The crystals contain 76·1% of quinine, 8·7% of sulphuric acid, and 15·2% of water; of the last, they lose about 3-4ths by exposure to dry air, and nearly the whole when kept in a state of fusion for some time.

Pur. This may not be inferred from the form of its crystallisation, for the sulphates of quinidine and of cinchonidine may be obtained in the same form of crystallisation. As mentioned already, the reaction with chlorine and ammonia does not distinguish quinine from quinidine, as both give the same green colour. "It is entirely soluble in water (hot), and more readily so when an acid is present. Precipitated by ammonia, the residuary liquid, after evaporation, should not taste of sugar. By a gentle heat it loses 8 or 10% of water. It is wholly consumed by heat. If chlorine be first added, and then ammonia, it becomes green." (Ph. L. 1836.) "On adding chloride of barium to 100 grs. of this salt, dissolved in water mixed with hydrochloric acid, 26·6 grs. of sulphate of baryta, dried at a red heat, are prepared." (Ph. L. 1851.) "A solution of 10 grs., in 1 fl. oz. of distilled water, and 2 or 3 drops of sulphuric acid, if decomposed by a solution of ½ oz. of carbonate of soda, in two waters, and heated until the precipitate shrinks and fuses, yields, on cooling, a solid mass, which, when dry, weighs 7·4 grs., and when reduced to powder, dissolves entirely in a solution of oxalic acid." (Ph. E.)

Adult. Sulphate of quinine is said to be often adulterated with starch, magnesia, gum, sugar, cinchonine, quinidine, &c.; but according to De Vrij, those with starch, magnesia, gum, and sugar, are very rare, if ever they were really observed. Very frequent are those with the sulphates of the other cinchona-alkaloids, and these become even still more frequent, as very different kinds of bark are used for the manufacture of quinine. Salicine is, if ever, but very seldom used for adulteration of quinine. The best practical test for the purity of sulphate of quinine is the following:—A saturated solution of the salt is made at 60° Fahr., and one part of this solution is mixed with 2 or 3 minims of a concentrated solution of iodide of potassium, whilst another part is mixed with 2 or 3 minims of a concentrated solution of tartrate of potash and soda. If the sulphate of quinine is pure its solution will remain unaltered by both reagents, even after rubbing the sides of the test tube with a glass rod and standing many hours. But if it contains one or more of the other cinchona-alkaloids there will appear either precipitates or striæ on the glass where it has been rubbed by the glass rod. Iodide of potassium indicates particularly the presence of even traces of quinidine, but also of cinchonidine and cinchonine, provided their quantity be not too small. Tartrate of potash and soda indicate, under these circumstances, only the presence of cinchonidine. The first three remain undissolved when the salt is digested in spirit; the fourth is dissolved out by cold water; the fifth may be detected by its total insolubility in ether; or, by precipitating the quinine by solution of potassa, and dissolving the precipitate in boiling alcohol; cinchonine crystallises out as the solution cools, but the quinine remains in the mother-liquor; and the last, by the greater solubility and sp. gr. of the salt, &c. If the sample disengages ammoniacal fumes when treated with liquor of potassa, it contains sal ammoniac. The presence of most foreign organic substances is also shown by the sample being turned brown, and being soon charred when treated with a drop of concentrated sulphuric acid. If it turn red it contains salicin, a substance which is now frequently used to adulterate sulphate of quinine. The pure sulphate is not discoloured by this reagent.

Uses, &c. The sulphate is more extensively employed than any of the other salts of quinine, and, indeed, to almost the exclusion of them. It is the article intended to be used whenever 'sulphate' or 'disulphate' of quinine, or even 'quinine,' is ordered for medicinal purposes, unless the name is qualified by some other term. It is a most valuable stomachic, in doses of ½ to 1 gr.; as a tonic, 1 to 3 grs.; and as a febrifuge, 2 to 20 grs.

Quinine, Sulpho-tar'trate of. *Syn.* QUINÆ SULPHO-TARTRAS, L. *Prep.* From sulphate of quinine, 4 parts; tartaric acid, 5 parts; distilled water, 20 parts; mix, gently evaporate to dryness, and powder the residuum.

Quinine, Tan'nate of. *Syn.* QUINÆ TANNAS, L. *Prep.* Dissolve sulphate of quinine in slightly acidulated water, and add a solution of tannic acid as long as a precipitate forms; wash this with a little cold water, and dry it. The Ph. Græca orders infusion of galls to be used as the precipitant. In intermittent neuralgia.

Quinine, Tar'trate of. *Syn.* QUINÆ TARTRAS, L. *Prep.* (P. Cod.) From tartaric acid and quinine, as the acetate.

Quinine, Vale''rianate of. *Syn.* QUINÆ VALERIANAS (Ph. D.), L. *Prep.* 1. As the acetate or citrate.

2. (Ph. D.) Valerianate of soda, 124 grs.; distilled water, 2 fl. oz.; dissolve; also dissolve hydrochlorate of quinine, 7 drs., in distilled water, 14 fl. oz.; next heat each solution to 120° (not higher), mix them, and set the vessel aside for 24 hours; lastly, press the mass of crystals thus obtained, and dry them, without the application of artificial heat.

Prop., &c. Silky needles and prisms; its solution suffers decomposition when heated much above 120° Fahr. It is powerfully antispasmodic, antiperiodic, and nervine.—*Dose.* ½ gr., every two hours, or 1 to 3 grs., twice or thrice daily; in epilepsy, hemicrania, hysteria, neuralgia, and other nervous affections.

QUININE AND COD-LIVER OIL. *Syn.* COD-LIVER OIL WITH QUININE, QUINIARETTED COD-LIVER OIL; OLEUM MORRHUÆ CUM QUINÂ, OLEUM JECORIS ASELLI CUM QUINÂ, L. This medicine is a solution of pure anhydrous quinine in pure cod-liver oil.

Prep. 1. Pure quinine (preferably recently precipitated) is fused in a glass or porcelain capsule by the heat of an oil or sand bath, carefully applied, by which it assumes a brown colour and the appearance of a resin; it is then allowed to cool out of contact with the air, after which it is reduced to powder in a dry mortar, and added to pure pale Newfoundland cod-liver oil, gently heated in a closed glass vessel over a water bath; the solution of the alkaloid is promoted by constant agitation, and, when complete, the vessel, still corked, is set aside in a dark situation to cool; when the 'quiniaretted oil' is quite cold, it is put into bottles, in the usual manner, and preserved, as much as possible, from the light and air.

2. The anhydrous quinine is dissolved in a little anhydrous ether before adding it to the oil, which in this case need not be heated, as the union is effected by simple agitation; should this not take place, it may be gently warmed for a few minutes.

3. The anhydrous quinine is dissolved in anhydrous alcohol, and after being added to the oil, the whole is gently heated, in an open vessel, by the heat of a water bath, until the alcohol is expelled; agitation, &c., being had recourse to, as in No. 1.

Prop., &c. The above preparation resembles ordinary cod-liver oil, except in having a pale yellowish colour, and a slightly bitter taste, similar to that of cinchona bark. It is said to possess all the properties of cod-liver oil combined with those peculiar to quinine, by which the tonic, stomachic, and antiperiodic qualities of the latter are associated, in one remedy, with the genial, supporting, and alterative action of the other. The common strength is 2 grs. of quinine per oz.

QUININE AND I'RON. These two important medicinal agents are combined together in various ways. The following compound salts are often prescribed.

Quinine and Iron, Cit'rate of. *Syn.* CITRATE OF IRON AND QUININE; FERRI ET QUINÆ CITRAS, B. P. *Prep.* 1. (B. P.) Solution of persulphate of iron, 4½; sulphate of quinia, 1; dilute sulphuric acid, 1½; citric acid, 3; solution of ammonia and distilled water, of each, a sufficiency: mix 8 of the solution of ammonia with 40 of the water, and to this add the solution of persulphate of iron, previously diluted with 40 of the water, stirring them constantly and briskly. Let the mixture stand for two hours, stirring it occasionally, then put it on a calico filter, and when the liquid has drained away, wash the precipitate with distilled water until that which passes through the filter ceases to give a precipitate with chloride of barium. Mix the sulphate of quinia with 8 of the water, add the sulphuric acid, and when the salt is dissolved, precipitate the quinia with a slight excess of solution of ammonia. Collect the precipitate on a filter, and wash it with 30 of the water. Dissolve the citric acid in 5 of the water, and having applied the heat of a water bath, add the oxide of iron, previously well drained; stir them together, and when the oxalic acid has dissolved, add the precipitated quinia, continuing the agitation until this also has dissolved. Let the solution cool, then add, in small quantities at a time, 1½ solution of ammonia, dilute with 2 of the water, stirring the solution briskly, and allowing the quinia, which separates with each addition of ammonia, to dissolve before the next addition is made. Filter the solution, evaporate it to the consistence of a thin syrup, then dry it in layers on flat porcelain or glass plates, at the temperature of 100° Fahr., remove the dry salt in flakes, and keep it in a stoppered bottle. Solubility, 2 in 1.—*Test.* Taste bitter as well as chalybeate. When burned with exposure to air, it leaves a residue (oxide of iron) which yields nothing to water. 50 grs., dissolved in an ounce of water, and treated with a slight excess of ammonia, gives a white precipitate (quinia) which, when collected on a filter and dried, weighs 8 grs. The precipitate is entirely soluble in pure ether, indicating absence of quinidia and cinchonia. When burned it leaves no residue. When dissolved by the aid of an acid it forms a solution which, after decolorisation by a little purified animal charcoal, turns the plane of polarisation strongly to the left (cinchona turns it to the right).—*Dose.* 5 to 10 grs. as a tonic, three times a day, in solution or in pill.

2. (Ph. U. S.) Triturate sulphate of quinine, 1 oz., with distilled water, 6 fl. oz., and having added sufficient diluted sulphuric acid to dissolve it, cautiously pour into the solution water of ammonia with constant stirring, until in slight excess. Wash the precipitated quinine on a filter, and having added solution of citrate of iron, 10 fl. oz., keep the whole at a temperature of 120° by means of a water bath, and stir constantly until the alkaloid is dissolved. Lastly, evaporate the solution to the consistence of a syrup, and spread it on plates of glass, so that, on drying, the salt may be obtained in scales.—*Dose.* 2 grs. to 5 grs.

Quinine and Iron, I'odide of. *Syn.* QUINÆ ET FERRI IODIDUM, L. *Prep.* From protiodide of iron, 2 parts; hydriodate of quinine, 1 part; rectified spirit, 12 parts; heat them together, and either evaporate to dryness or crystallise by refrigeration. A powder, or crystalline scales.

Quinine and Iron, Sul'phate of. *Syn.* FERRO-SULPHATE OF QUININE; QUINÆ FERRO-SULPHAS, QUINÆ ET FERRI SULPHAS, L. *Prep.* From solutions of the sulphates of iron and quinine, in atomic proportions, mixed whilst hot, and the crystals which form as the liquid cools carefully dried and preserved from the air.

QUININE AND MER'CURY. See CHLORIDE OF MERCURY AND QUININE.

QUINOID'INE. *Syn.* AMORPHOUS QUININE, CHINOIDINE; QUINA AMORPHA, QUINA INFORMIS, QUINOIDIA, QUINOIDINA, QUINOIDINUM, CHINOIDEUM, L. A few years after the discovery of the quinine by Pelletier and Caventou, Sertuerner, a German physician, and known as the discoverer of morphia, obtained, by a peculiar method, from yellow bark, an amorphous alkaloid which was called by him Chinioidin,[1] and also fever-killer (Fiebertödter). He found that not only this alkaloid itself, but also all its compounds with acids, were equally amorphous. As recent investigations have proved that this amorphous alkaloid occurs in all cinchona barks, and is found particularly in many young Indian barks in great quantity, it is quite natural that in the manufacture of quinine the uncrystallisable sulphate of this alkaloid should accumulate in the mother-liquors of the sulphate of quinine. From such liquors it is precipitated in an impure state by an alkali, and brought into commerce under the name of quinoidine. As this amorphous alkaloid has the property of preventing the crystallisation of the salts of the other alkaloids, particularly those of quinidine, it is clear that the quinoidine of commerce very often contains quinidine and also cinchonidine. Dr. de Vrij, for instance, found sometimes more than 20% of quinidine in some samples of quinoidine of commerce. Although commercial quinoidine contains many impurities which may have their origin partly in the adulteration of the cinchona-alkaloids, unadulterated quinoidine, no doubt, chiefly consists of the amorphous alkaloid discovered by Sertuerner.

The quinoidine of commerce ought never to be used in medicine, unless purified. For this purification there are two methods. 1. That of Mr. Bullock, which gives the purer but the more expensive product. Crude quinoidine is exhausted with ether, which, after defecation, is distilled off, leaving the purified quinoidine behind. This process has been patented in England by Mr. Bullock. 2. That of Dr. de Vrij, which consists in boiling 9 parts of crude quinoidine with a solution of 2 parts of oxalate of ammonium in water. By this process the alkaloids contained in the quinoidine are dissolved, whilst the impurities, and amongst them the lime which is often contained in the crude quinoidine, remain undissolved. The solution is mixed with a large bulk of water, then filtered and the purified quinoidine precipitated by a slight excess of liquor of soda.

Prop., &c. In its crude form quinoidine somewhat resembles aloes; in its purest state it is a yellowish-brown resin-like mass, freely soluble in alcohol and ether, but nearly insoluble in water; with the acids it forms dark-coloured, uncrystallisable salts. It is powerfully febrifuge, but less so than either quinidine or quinine, although it is identical in chemical composition with both of them.—*Dose.* 2 to 4 grs. for adults, $\frac{1}{2}$ to 1 gr. for children, given in wine, lemonade, or acidulated honey.

QUINOM'ETRY. *Syn.* CINCHONOMETRY. The art of estimating the quantity of quinine in cinchona bark, and in the commercial salts of this alkaloid.

Proc. 1. FOR BARK.—*a.* (Ph. E.) A filtered decoction of 100 grs. of bark, in distilled water, 2 fl. oz., is precipitated with 1 fl. dr., or q. s., of a concentrated solution of carbonate of soda; the precipitate, after being heated in the fluid so as to become a fused mass, and having again become cold, is dried and weighed. "It should be 2 grs., or more, and entirely dissolve in a solution of oxalic acid." To render the result strictly accurate, the product should be dissolved in 10 parts of proof spirit, containing $\frac{1}{10}$th of sulphuric acid, and to this solution carefully added an alcoholic solution of iodine as long as there appears a brown precipitate, which immediately turns black by stirring with a glass rod. This precipitate, collected upon a filter, washed with strong alcohol and dried on a water bath, is Herape iodosulphate of quinine, of which 100 parts represent 56·5 parts of pure quinine.

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[1] Sertuerner, 'Die neuesten Entdeckungen in der Physik, Heilkunde, und Chemie,' 3ter Band, 2tes Heft, Seite 269 (1830).

b. (Rebourdain.) 100 grs. of the bark (coarsely powdered) are exhausted with acidulated water, and the filtered solution rendered alkaline with solution of potassa; it is next shaken with about 1-3rd of its volume of chloroform, and then allowed to repose for a short time; the chloroform holding the alkaloid in solution sinks to the bottom of the vessel in a distinct stratum, from which the supernatant liquid is separated by decantation; the chloroformic solution, either at once or after being washed with a little cold water, is allowed to evaporate; the residuum, when weighed, gives the per-centage richness of the sample.

Obs. A like result may be obtained with ether, instead of chloroform; in which case the solution of quinine will form the upper stratum.

c. Instead of Rebourdain's process, Dr. de Vrij prefers that of Charles,[1] so far as regards the separation of the total mixed alkaloids from the bark. To this mixture is applied the process mentioned above (*a*), viz. solution in acidulated proof spirit, &c.

2. For the SALTS. The above methods, as well as several others which have been devised for the purpose, may also be applied to the salts of quinine; but, unfortunately, they are inapplicable when great accuracy is required, owing to the non-recognition of the presence of quinidine, as such, and which, consequently, goes to swell the apparent richness of the sample in quinine. The following ingenious method, invented by Dr. Ure, not merely enables us to detect the presence of cinchonine and quinidine in commercial samples of the salts of quinine, but, with some trifling modifications, it also enables us to determine the quantity of each of these alkaloids present in any sample:—"10 grs. of the salts to be examined" (the sulphate is here more especially referred to) "is put into a strong test-tube, furnished with a tight-fitting cork; to this are to be added 10 drops of dilute sulphuric acid (1 acid and 5 water), with 15 drops of water, and a gentle heat applied to accelerate solution. This having been effected, and the solution entirely cooled, 60 drops of officinal sulphuric ether, with 20 drops of liquor of ammonia, must be added, and the whole well shaken while the top is closed by the thumb. The tube is then to be closely stopped, and shaken gently from time to time, so that the bubbles of air may readily enter the layer of ether. If the salt be free from cinchonine and quinidine, or contain the latter in no greater proportion than 10%, it will be completely dissolved; while on the surface, where contact of the two layers of clear fluid takes place, the mechanical impurities only will be separated. After some time the layer of ether becomes hard and gelatinous, and no further observation is possible."

"From the above statement respecting the solubility of quinidine in ether, it appears that the 10 grs. of the salt examined may contain 1 gr. of quinidine, and still a complete solution with ether and ammonia may follow; but in this case the quinidine will shortly begin to crystallise in a layer of ether. The least trace of quinidine may be yet more definitely detected by employing, instead of the ordinary ether, some ether previously saturated with quinidine, by which means all of the quinidine contained in the quinine examined must remain undissolved. It is particularly requisite, in performing this last experiment, to observe, (immediately) after the shaking, whether all has dissolved; for, owing to the great tendency of quinidine to crystallisation, it may become again separated in a crystalline form, and be a source of error."

"If more than 1-10th of quinidine or (any) cinchonine be present, there will be found an insoluble precipitate at the limits of the two layers of fluids. If this be quinidine, it will be dissolved on the addition of proportionately more ether, while cinchonine will remain unaffected."

Note. To Dr. Ure's test Dr. de Vrij prefers, for several reasons, Dr. Kerner's test, 'Zeitschrift für Analytische Chemie,' von Fresenius, 1st Jahrg, 1862; 'Ueber Die Prufung des Käuflichen Schwefelsauren Chinins auf fremde Alkaloides, von Dr. G. Kerner.'

QUINOVIN. $C_{30}H_{48}O_8$. *Syn.* CINCHOVIN, QUINOVIA.

QUINOVIN. A very bitter amorphous glucoside contained in the genus Cinchona, Nauclea, and probably in many other allied genera. It is insoluble in water, very soluble in rectified spirit and in chloroform, with which last liquid it forms, in concentrated solutions, a jelly. If a current of hydrochloric gas is passed into its alcoholic solution the liquid becomes hot and the quinovin is split up into a peculiar kind of sugar.

QUINOVIC ACID. $C_{24}H_{38}O_4$. This is insoluble in water, also in chloroform, and difficultly soluble in alcohol. It can be obtained from the boiling alcoholic solution, by cooling, in small crystals. In the leaves, bark, and wood, of the cinchona tree this acid is contained, together with quinovin, and it is this mixture which has been recently applied in therapeutics, as a powerful tonic in cases of dysentery, &c. The mixture can easily be obtained from the leaves, bark, or wood, of cinchona, and even from bark which has been exhausted by ebullition with water or diluted acids, by cold maceration with weak milk of lime, by which it is dissolved, as it combines easily with bases. It is only the quinovate of lime which has till now been used in medicine.—*Dose.* 2 to 8 grs. every two hours.

QUIN'QUINA. See CINCHONA.

QUIN'SY. See THROAT AFFECTIONS.

QUINTES'SENCE. *Syn.* QUINTA ESSENTIA, L. A term invented by the alchemists to represent a concentrated alcoholic solution of the active principles of organic bodies. It is still occasionally employed in perfumery and the culinary art. See Essence, Tincture, &c.

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[1] 'Journal de Pharmacie et de Chimie,' 4e série, t. 12, p. 81 (Août, 1870).

QUOTID'IAN. Occurring or returning daily. See Ague.

RAB'BIT. The *Lepus cuniculus* (Linn.) of the Cuvian order *Rodentia*. The domestic rabbit, when young, is a light and wholesome article of food, approaching in delicacy to the common barn-door fowl; but has less flavour than the wild animal. The fat is among the 'simples' of the Ph. L. 1618. Its hair and skin are made into cheap furs, gloves, hats, &c.

RAC'AHOUT. *Syn.* Racahout des Arabes. This is said to be farina prepared from the acorns of *Quercus Ballota*, or Barbary oak, disguised with a little flavouring. The following is recommended as an imitation:—Roasted cacao or chocolate nuts, 4 oz.; tapioca and potato farina, of each, 6 oz.; white sugar, slightly flavoured with vanilla, ½ lb. Very nutritious. *Used* as arrow-root.

RACE'MIC ACID. *Syn.* Paratartaric acid. This compound was discovered by Kestner, in 1820, replacing tartaric acid in grape-juice of the Department of the Vosges. Racemic acid and tartaric acid have exactly the same composition, and yield, when exposed to heat, the same products; the racemates also correspond in the closest manner with the tartrates. Racemic acid is rather less soluble than tartaric, and separates first from a solution containing the two acids. A solution of racemic acid precipitates a neutral salt of calcium, which is not the case with tartaric acid. A solution of racemic acid does not affect a ray of polarised light, while a solution of tartaric acid rotates the ray to the right.

RACK'ING. See Cider and Wines.

RAD'ICAL. *Syn.* Radicle. According to the binary theory of the constitution of saline compounds, every salt is composed, like chloride of sodium (NaCl), of two sides or parts, which are termed its radicals. That part of a salt which consists of a metal, or of a body exercising the chemical functions of one, is called the metallic, basic, or basylous radical; while the other part, which, like chlorine, by combining with hydrogen would produce an acid, is designated the chlorous or acidulous radical. Every salt, therefore, consists of a basic and of an acid radical. Sometimes radicals are elementary in their nature, when they are called *simple;* and sometimes they are made up of a group of elements, when they are termed *compound.* Some radicals, both simple and compound, have been isolated, while many have but a hypothetical existence. In the following formulæ the vertical line separates the basic from the acid radicals, the former being on the left, the latter on the right:

H	F	Hydrofluoric acid (*Fluoride of hydrogen*).
Na	Cl	Chloride of sodium.
K	CN	Cyanide of potassium.
Ca	CO_3	Carbonate of calcium.
NH_4	Cl	Chloride of ammonium.
C_2H_5	NO_2	Nitrite of ethyl.

RAD'ISH. The common garden radish (raphanus, L.) is the root of *Raphanus sativus* (Linn.), one of the *Cruciferæ.* There are several varieties. They are all slightly diuretic and laxative, and possess considerable power in exciting the appetite. The seed is pressed for oil. The horseradish (armoracia, L.) belongs to a distinct genus.

RAIN-GAUGE. *Syn.* Ombometer, Pluviameter, Udometer. An instrument for determining the quantity of water, which falls as rain, at any given place. A simple and convenient rain-gauge for agricultural purposes is formed of a wide-mouthed funnel, or open receiver, connected with a glass tube furnished with a stop-cock. The diameter of the tube may be exactly 1-100th that of the receiver, and if the tube be graduated into inches and tenths, the quantity of rain that falls may be easily read off to the 1-1000th of an inch. The instrument should be set in some perfectly open situation; and, for agricultural purposes, with its edge as nearly level with the ground as possible. The quantity of water should be duly measured and registered at 9 a.m., daily.

RAI'SINS. *Syn.* Dried grapes; Uvæ (B. P.), Uvæ siccatæ, Uva (Ph. L.), Uvæ passæ (Ph. E. & D.), L. "The prepared fruit of *Vitis vinifera*" (Linn.)—Ph. L. The grapes are allowed to ripen and dry on the vine. After being plucked and cleaned, they are dipped, for a few seconds, into a boiling lye of wood ashes and quicklime at 12° or 15° Baumé, to every 4 galls. of which a handful of culinary salt and a pint of salad oil has been added; they are then exposed for 12 or 14 days in the sun to dry; they are, lastly, carefully garbled, and packed for exportation. The sweet, fleshy kinds of grapes are those selected for the above treatment; and, in general, their stalks are cut about one half through, or a ring of bark is removed, to hasten their maturation.

Raisins are nutritious, cooling, antiseptic, and, in general, laxative; the latter to a greater extent than the fresh fruit. There are many varieties found in commerce. Their uses as a dessert and culinary fruit, and in the manufacture of wine, &c., are well known, and are referred to elsewhere. See Grapes, Wines, &c.

RANCID'ITY. The strong, sour flavour and odour which oleaginous bodies acquire by age and exposure to the air. For its prevention, see Fats, Oils (Fixed), &c.

RAPE OIL. See Oils (Fixed).

RASH. Erasmus Wilson notices four different affections, as included under this head:—

1. St. Anthony's fire, or erysipelas, the severest of them all, already referred to.

2. Nettle-rash, or urticaria, characterised by its tingling and pricking pain, and its little white elevations on a reddish ground, like the wheals caused by the sting of a nettle. This efflorescence seldom stays many hours, and, sometimes, not even many minutes, in the same place, and is multiplied or reproduced whenever any part of the skin is scratched or even touched. No part of the body is exempt from it, and when many of them occur together, and continue for an hour or two, the parts are often considerably swelled, and the features temporarily disfigured. In many cases these eruptions continue to infest the skin, sometimes in one place, and sometimes in another, for one or two hours together, two or three times a day, or, perhaps, for the greatest part of the twenty-four hours. In some constitutions this lasts only a few days; in others several months.

There are several varieties of nettle-rash or urticaria noticed by medical writers, among which urticaria febrilis, persistans, and evanida, are the principal.

The common cause of nettle-rash is some derangement of the digestive functions, arising either from the use of improper food or a disordered state of the nervous or other systems of the body. Lobsters, crabs, mussels, shrimps, dried fish, pork, cucumbers, mushrooms, and adulterated beer or porter, bear the character of frequently causing this affection. In childhood it commonly arises from teething. Occasionally, in persons of peculiar idiosyncrasy, the most simple article of food, as almonds, nuts, and even milk, rice, and eggs, will produce this affection.

The treatment may consist of the administration of gentle saline aperients, and in severer cases a gentle emetic, followed by the copious use of acidulated diluent drinks, as weak lemon-juice-and-water, effervescing potassa-draughts, &c., and, when required, diaphoretics. The clothing should be light, but warm, and the itching, when severe, may be allayed by the application of a lotion of water to which a little vinegar or camphorated spirit has been added; the latter must, however, be employed with caution. A hot knee-bath is useful in drawing the affection from the face and upper part of the body. A 'compress,' wrung out of cold water until it ceases to drip, and kept in contact with the stomach by means of a dry bandage, has been recommended to relieve excessive irritation of the stomach and bowels. It has been stated that decoction of Virginian snake-root is particularly useful in relieving chronic urticaria.

3. Red-rash, red-blotch, or fiery spot, is commonly the consequence of disordered general health, of dyspepsia, and particularly, in females, of tight lacing. Sometimes it is slight and evanescent; at others, it approaches in severity to the milder forms of erysipelas, there being much swelling and inflammation. Chaps, galls, excoriations, and chilblains, are varieties of this disease produced by cold, excessive moisture, or friction. The treatment is similar to that of nettle-rash.

4. Rose-rash, false measles, or roseola, is an efflorescence, or rather a discoloration, of a rose-red tint, in small irregular patches, without wheals or papulæ, which spread over the surface of the body, and are ushered in by slight febrile symptoms. There are several varieties. The causes are the same as those which produce the preceding affections, and the treatment may be similar. In all of them strict attention to the diet, and a careful avoidance of cold applications, or exposure to cold, so as to cause a retrocession, are matters of the first moment.

RASP'BERRY. *Syn.* Hindberry. The fruit of *Rubus Idæus* (Linn.), a small shrub of the natural order *Rosaceæ*. It is cooling, antiscorbutic, and mildly aperitive. It is frequently used to communicate a fine flavour to liqueurs, confectionery, wine, &c. See Fruits and Vegetables.

RATAFI'A. Originally, a liquor drank at the ratification of an agreement or treaty. It is now the common generic name in France of liqueurs compounded of spirit, sugar, and the odoriferous and flavouring principles of vegetables, more particularly of those containing the juices of recent fruits, or the kernels of apricots, cherries, or peaches. In its unqualified sense, this name is commonly understood as referring to cherry-brandy or peach-brandy.

Ratafias are prepared by distillation, maceration, or extemporaneous admixture, in the manner explained under the head Liqueur. The following list includes those which are commonly prepared by the French liquoristes:—

Ratafia d'Angelique. From angelica seeds, 1 dr.; angelica stalks, 4 oz.; blanched bitter almonds, bruised, 1 oz.; proof spirit or brandy, 6 quarts; digest for 10 days, filter; add, of water, 1 quart; white sugar, 3½ lbs.; mix well, and in a fortnight decant the clear portion through a piece of clear flannel.

Ratafia d'Anis. See Aniseed Cordial.

Ratafia de Baume de Tolu. From balsam of Tolu, 1 oz.; rectified spirit, 1 quart; dissolve, add water, 3 pints; filter, and further add of white sugar, 1½ lb. Pectoral and traumatic.

Ratafia de Brou de Noix. From young walnuts with soft shells (pricked or pierced), 60 in no.; brandy, 2 quarts; mace, cinnamon, and cloves, of each, 15 grs.; digest for 8 weeks; press, filter, add of white sugar, 1 lb.; and keeping it for some months before decanting it for use. Stomachic.

Ratafia de Cacao. *Syn.* R. de chocolat. From Caracca cacao-nuts, 1 lb.; West Indian do., ½ lb.; (both roasted and bruised;) proof spirit, 1 gall.; digest for 14 days, filter, and add, of white sugar, 2½ lbs.; tincture of vanilla, ½ dr.; (or, a shred of vanilla may be infused with the nuts in the spirit instead;) lastly, decant in a month, and bottle it.

Ratafia de Café. From coffee, ground and roasted, 1 lb.; brandy or proof spirit, 1 gall.; sugar, 2 lbs.; (dissolved in) water, 1 quart; as last.

Ratafia de Cassis. From black-currant juice, 1 quart; cinnamon, 1 dr.; cloves and peach kernels, of each, ½ dr.; brandy, 1 gall.; white sugar, 3 lbs.; digest for a fortnight, and strain through flannel.

Ratafia de Cerise. From Morello cherries, with their kernels bruised, 8 lbs.; brandy or proof spirit, 1 gall.; white sugar, 2 lbs.; as last.

Ratafia de Chocolat. Ratafia de cacao (see *above*).

Ratafia de Coings. From quince juice, 3 quarts; bitter almonds, 3 drs.; cinnamon and coriander seeds, of each, 2 drs.; mace, ½ dr.; cloves, 15 grs.; (all bruised;) rectified spirit (quite flavourless), ½ gall.; digest for a week, filter, and add of white sugar, 3½ lbs.

Ratafia de Crème. From crème de noyeau and sherry, of each, ¼ pint; capillaire, ½ pint; fresh cream, 1 pint; beaten together.

Ratafia de Curaçoa. Curaçoa.

Ratafia de Framboises. Raspberry cordial.

Ratafia de Genièvre. From juniper berries (each pricked with a fork, ¼ lb.; caraway and coriander seed, of each, 20 gr.; finest malt spirit (22 u. p.), 1 gall.; white sugar, 2 lbs.; digest a week, and strain with expression.

Ratafia de Grenoble. From the small wild black cherry (with the kernels bruised), 2 lbs.; proof spirit, 1 gall.; white sugar, 3 lbs.; citron peel, a few grains; as before.

Ratafia de Grenoble, de Teyssère. From cherries (bruised with the stones), 1 quart; rectified spirit, 2 quarts; mix, digest for 48 hours, then express the liquor, and heat it to boiling in a close vessel; when cold, add of sugar or capillaire, q. s., together with some noyeau, to flavour, and a little syrup of the bay laurel, and of galangal; in 3 months decant, and bottle it.

Ratafia de Noyeau. From peach or apricot kernels (bruised), 120 in no.; proof spirit or brandy, 2 quarts; white sugar, 1 lb.; digest for a week, press, and filter.

Ratafia de Œillets. From clove-pinks (without the white buds), 4 lbs.; cinnamon and cloves, of each, 15 grs.; proof spirit, 1 gall.; macerate for 10 days, express the tincture, filter, and add of white sugar, 2½ lbs.

Ratafia d'Ecorce d'Orange. Crème d'Orange.

Ratafia de Fleurs d'Oranger. From fresh orange petals, 2 lbs.; proof spirit, 1 gall.; white sugar, 2½ lbs.; as last. Instead of orange flowers, neroli, 1 dr., may be used.

Ratafia à la Provençale. From striped pinks, 1 lb.; brandy or proof spirit, 1 quart; white sugar, ¾ lb.; juice of strawberries, ¾ pint; saffron, 20 grs.; as before.

Ratafia des Quatre Fruits. From cherries, 30 lbs.; gooseberries, 15 lbs.; raspberries, 8 lbs.; black currants, 7 lbs.; express the juice, and to each pint add, of white sugar, 6 ozs.; cinnamon, 6 grs.; cloves and mace, of each, 3 grs.

Ratafia Rouge. From the juice of black cherries, 3 quarts; juices of strawberries and raspberries, of each, 1 quart; cinnamon, 1 dr.; mace and cloves, of each, 15 grs.; proof spirit or brandy, 2 galls.; white sugar, 7 lbs.; macerate, &c., as before.

Ratafia Sec. Take of the juice of gooseberries, 5 pints; juices of cherries, strawberries, and raspberries, of each, 1 pint; proof spirit, 6 quarts; sugar, 7 lbs.; as before.

Ratafia à la Violette. From orris powder, 3 oz.; litmus, 4 oz.; rectified spirit, 2 galls.; digest for 10 days, strain, and add of white sugar, 12 lbs., dissolved in soft water, 1 gall.

RATS. The common or brown rat is the *Mus Decumanus* (Linn.), one of the most prolific and destructive species of the *Rodentia*. It was introduced to these islands from Asia; and has since spread over the whole country, and multiplied at the expense of the black rat (*Mus Rattus*—Linn.), which is the old British species of this animal, until its inroads on our granaries, our stores, and dwelling-houses, have increased to such an extent, that its extirpation has become a matter of serious, if not of national, importance.

For the destruction of these noxious animals two methods are adopted:—

1. Trapping. To render the bait more attractive, it is commonly sprinkled with a little of one of the rat-scents noticed below. The trap is also occasionally so treated.

2. Poisoning. The following are reputed the most effective mixtures for this purpose:—

Arsenical Paste. From oatmeal or wheaten flour, 3 lbs.; powdered indigo, ½ oz.; finely powdered white arsenic, ¼ lb.; oil of aniseed, ½ dr.; mix, add of melted suet, 2½ lbs.; and beat the whole into a paste. A similar compound has the sanction of the French Government.

Arsenical Powder. From oatmeal, 1 lb.; moist sugar, ¼ lb.; white arsenic and rotten cheese, of each, 1 oz.; rat-scent, a few drops.

Millers' Rat Powder. From fresh oatmeal, 1 lb.; nux vomica (in very fine powder), 1 oz.; rat-scent, 5 or 6 drops. This is highly spoken of by those who have used it.

Mineral Rat-poison. From carbonate of baryta, ¼ lb.; sugar and oatmeal, of each, 6 oz.; oils of aniseed and caraway, of each, a few drops.

Philantrope Muophobon. A French preparation, which, according to Mr. Beasley, consists of tartar emetic, 1 part, with farinaceous matter, 4 parts, and some other (u important) ingredients.

PHOSPHOR PASTE.

Among 'rat-scents' the following are said to be the most attractive:—

a. Powdered cantharides steeped in French brandy. For traps. It is said that rats are so fond of this, that if a little be rubbed about the hands they may be handled with impunity.

b. From powdered assafœtida, 8 grs.; oil of rhodium, 2 drs.; oil of aniseed, 1 dr.; oil of lavender, ½ dr.; mix by agitation.

c. From oil of aniseed, ½ oz.; tincture of assafœtida, ¼ oz.

d. From oil of aniseed, ¼ oz.; nitrous acid, 2 to 3 drops; musk (triturated with a little powdered sugar), 1 gr.

RA'ZORS. See PAPER, PASTE, and SHAVING.

REA'GENTS. See TESTS.

REAL'GAR. This valuable red pigment is the bisulphide of arsenic. It is found native in some volcanic districts; but that of commerce is prepared by distilling (in an earthen retort) arsenical pyrites, or a mixture of sulphur and arsenic, of orpiment and sulphur, or of arenious acid, sulphur, and charcoal, in the proper proportions. See BISULPHIDE OF ARSENIC.

RECTIFICA'TION. A second distillation of a fluid, for the purpose of rendering it purer.

RED. A term denoting a bright colour, resembling blood. Red is a simple or primary colour, but of several different shades or hues, as scarlet, crimson, vermilion, orange-red, &c.

Red An'iline. *Syn.* ROSANILINE. This artificial base is prepared by the action of bichloride of tin, mercurial salts, arsenic acid, and many other oxidising agents, upon aniline. The aniline reps of commerce, now so largely used for dyeing, are saline compounds, more or less pure, of rosaniline, with 1 equiv. of acid. These compounds are known under the names of 'magenta,' 'fuchsine,' 'roseine,' 'azaleine,' &c. In England the aniline red commonly employed is the acetate of rosaniline, which has been prepared by Mr. Nicholson in splendid crystals of very considerable dimensions. In France the hydrochlorate of rosaniline is chiefly employed. The free base presents itself in colourless crystalline plates, but its compounds with 1 equiv. of acid have, when dry, a beautiful green colour, with golden lustre, and furnish with water an intensely coloured red solution. See PURPLE (Aniline) and RED DYE, also TAR COLOURS.

RED DYE. The substances principally employed for dyeing reds are cochineal, lac-dye, and madder, which, under proper treatment, yield permanent colours of considerable brilliancy, the first and third more particularly so. Extremely beautiful but fugitive colours are also obtained from Brazil wood, safflower, archil, and some other substances. For purple-reds or crimsons (magenta, fuchsine, &c.), on silk or wool, the aniline reds (salts of rosaniline) are now extensively used. (See TAR-COLOURS.) The mode of applying them is noticed under PURPLE DYE. SILK is usually dyed of a permanent red or scarlet with cochineal, safflower, or lac-dye; wool, with cochineal and, still more frequently, with madder; and cotton, with madder (chiefly), Brazil wood, &c. The leading properties of these substances are given under their respective names, and the methods of employing them are generally referred to in the articles DYEING, MORDANTS, &c., and, therefore, need not be repeated here. The following may, however, be useful to the reader:—

1. First give the 'goods' a mordant of alum, or of alum-and-tartar, rinse, dry, and boil them in a bath of madder. If acetate of iron be used instead of alum, the colour will be purple, and by combining the two, as mordants, any intermediate shade may be produced.

2. The yarn or cloth is put into a very weak alkaline bath at the boiling temperature, then washed, dried, and 'galled' (or, when the calico is to be printed, for this bath may be substituted one of cow-dung, subsequent exposure to the air for a day or two, and immersion in very dilute sulphuric acid. In this way the stuff gets opened, and takes and retains the colour better). After the 'galling,' the goods are dried, and alumed twice; then dried, rinsed, and passed through a madder bath, composed of ¾ lb. of good madder for every lb. weight of the goods; this bath is slowly raised to the boiling-point in the course of 50 or 60 minutes, more or less, according to the shade of colour required; after a few minutes, the stuff is taken out, and slightly washed; the operation is then repeated, in the same manner, with fresh madder; it is, lastly, washed and dried, or passed through a hot soap bath, which carries off the fawn-coloured particles.

3. (ADRIANOPLE RED, TURKEY R.) This commences with cleansing or scouring the goods by alkaline baths, after which they are steeped in oily liquors brought to a creamy state by a little carbonate of soda; a bath of sheep's dung is next often used as an intermediate or secondary steep; the oleaginous bath, and the operation of removing the superfluous or loosely adhering oil with an alkaline bath, is repeated two or three times, due care being taken to dry the goods thoroughly after each distinct process; then follow the distinct operations of galling, aluming, maddering, and brightening, the last for removing the dun-coloured principle, by boiling at an elevated temperature with alkaline liquids and soap; the whole is generally concluded with treatment by spirit of tin. In this way are given the most brilliant reds on cotton.

Obs. Wool takes from half its weight of madder to an equal weight to dye it red; cotton and linen take rather less. On account of the comparative insolubility of the colouring matter of madder, this dye-stuff must be boiled along with the goods to be dyed, and not removed from the decoction, as is the practice in using many other articles. Other dye-stuffs are frequently added to the madder bath, to vary the shades of colour. Decoction of fustic, weld, logwood, quercitron, &c., are often thus employed, the mordants being modified accordingly. By adding bran to the madder bath, the colour is said to be rendered much lighter, and of a more agreeable tint.

RED GUM. A slight eruptive disease of infancy, occasioned by teething, and, less frequently, by irritation from rough flannel worn next the skin. See STROPHULUS.

RED LAV'ENDER. See TINCTURE OF LAVENDER (Compound).

RED LIQ'UOR. The crude solution of acetate or sulpho-acetate of alumina employed in calico-printing. It is generally prepared by mixing crude sulphate of alumina with about an equal weight of crude pyrolignite of lime, both being in the state of solution.

RED PIG'MENTS. The preparation of the principal red pigments are described under their respective names. The following list includes most of the reds in use:—

Arme'nian Bole. *Syn.* BOLE ARMENIAN; BOLUS ARMENIÆ, L. Formerly imported from Armenia, Portugal, Tuscany, &c.; now generally made by grinding together a mixture of whiting, red oxide of iron, and red ochre, in nearly equal proportions.

Red, Brown. A factitious mixture of red oxide of iron and red ochre, in variable proportions.

Car'mine.

Carmina'ted Lake.

Red, Chrome. *Syn.* DICHROMATE OF LEAD, RED CHROMATE OF L.; PLUMBI DICHROMAS, P. CHROMAS RUBRUM, L. *Prep.* 1. Boil pure carbonate of lead with chromate of potassa, in excess, until it assumes a proper colour; then wash it well with pure water, and dry it in the shade.

2. Boil neutral chromate of lead with a little water of ammonia or lime water.

3. (Liebig and Wöhler.) Fuse saltpetre at a low red heat in a Hessian crucible, and throw in chromate of lead (pure chrome yellow), by small portions at a time, as long as a strong ebullition follows upon each addition of the pigment, observing to stir the mixture frequently with a glass rod; after repose for a minute or two, pour off the fluid part, and, as soon as the solid residuum is cold, wash it with water, and dry it by a gentle heat.

Obs. Great care must be taken, in conducting the last process, not to employ too much heat, nor to allow the saline matter to stand long over the newly formed chrome-red, as the colour is thus apt to change to a brown or orange. When well managed, the product has a crystalline texture, and so beautiful a red colour that it vies with native cinnabar. The liquid poured from the crucible is reserved for manufacturing chrome yellow.

Red, In'dian. *Syn.* PURPLE OCHRE; OCHRA PURPUREA PERSICA, TERRA PERSICA, L. This is a native production, brought from Ormus. A factitious article is prepared by calcining a mixture of colcothar and red ochre.

Lakes (Various).

Red, Light. From yellow ochre, by careful calcination. It works well with both oil and water, and produces an admirable flesh-colour by admixture with pure white. All the ochres, both red and yellow, are darkened by heat.

Red, Or'ange. *Syn.* SANDIX. Obtained from white lead, by calcination. Very bright.

Real'gar. Bisulphide of arsenic.

Red Bole. See ARMENIAN and VENETIAN BOLE.

Red Chalk. A clay iron ore, much used for pencils and crayons, and, when ground, also for paints.

Red Lead. *Syn.* MINIUM. The finest red lead is prepared by exposing ground and elutriated massicot, or dross of lead, in shallow iron trays (about 12 inches square, and about 4 or 5 inches deep), piled up on the hearth of a reverberatory furnace, to a heat of about 600 to 650° Fahr., with occasional stirring, until it acquires the proper colour. The furnace employed for the preparation of massicot during the day usually possesses sufficient residuary heat during the night for this process, by which fuel is saved. Lead for the above purpose should be quite free from copper and iron.

Red O'chre. A natural product abounding on the Mendip hills.

Red Or'piment. *Syn.* RED ARSENIC. Tersulphide of arsenic.

Rose Pink. This is whiting coloured with a decoction of Brazil wood to which a little pearlash has been added. A very pretty colour, but it does not stand. It is always kept in a damp state. The colour may be varied by substituting alum for pearlash, or by the addition of a little spirits of tin.

Red, Vene'tian. *Syn.* BOLUS VENETA, L. A species of ochre, brought from Italy.

Vermil'ion. (See that word.)

REDUC'TION. *Syn.* REVIVIFICATION. A term, in its fullest sense, applied to any operation by which a substance is restored to its neutral state; but now generally restricted, in chemistry, to the abstraction of oxygen, and hence frequently termed deoxidation or deoxidizement. This change is operated by either heating the substance in contact with carbon or hydrogen, or in exposing it to the action of some other body having a powerful affinity for oxygen. See POTASSIUM, &c.

REFI''NING. A term employed in commercial chemistry and metallurgy synonymously with purification. The separation of the precious metals from those of less value, as in the operation of parting, constitutes the business of the 'refiner.' See GOLD, SILVER, &c.

REFRAC'TION (of Light). The deviation of a ray of light from its original path on entering a medium of a different density or power. For the practical application of this property, see GEMS.

REFRI''GERANTS. Medicines or agents which tend to lessen the animal temperature without causing any marked diminution of sensibility or nervous energy. Among internal refrigerants cold water, weak acidulous drinks, and saline aperients, are those which are, probably, the best known, and the most useful. Among external refrigerants are cold, cold water, evaporating lotions, weak solutions of subacetate of lead, &c.

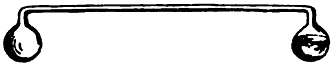
REFRIGERA'TION. The abatement of heat; the act or operation of cooling.

Among the purposes to which refrigeratory processes are applied in the arts, the principal are—the condensation of vapours—the cooling of liquids—the congelation of water, and—the production of extreme degrees of cold in chemical operations. The first of these is referred to under the heads DISTILLATION, STILL, &c.; and the second, under WORT. It is, therefore, only necessary to notice here the third and fourth applications of cold, artificially produced, above referred to.

The refrigeratory processes at present employed depend upon the greater capacity for heat which the same body possesses as its density lessens, or its attenuation increases; as exhibited in the sudden liquefaction of solids, the rapid evaporation of liquids, and the almost instantaneous return of atmospheric air, or other gaseous body, from a highly condensed state to its normal condition. The loss of sensible heat in the first example is the basis of the various processes of producing cold by what are commonly called 'FREEZING-' or 'FRIGORIFIC-MIXTURES,' all of which act upon the principle of liquefying solid substances without supplying heat. The caloric of liquidity being in these cases derived from that previously existing in the solid itself in a sensible state, the temperature must necessarily fall. The degree of cold produced depends upon the quantity of heat which is thus diffused through a larger mass, or which, as it were, disappears; and this is dependent on the quantity of solid matter liquefied, and the rapidity of the liquefaction. Saline compounds are the substances most frequently employed for this purpose, and those which have the greatest affinity for water, and thus liquefy the most rapidly, produce the greatest degree of cold. Similar changes occur during the evaporation of liquids. When heat passes from the sensible to the insensible state, as in the formation of vapour, cold is generated. This may be shown by pouring a few drops of ether or rectified spirit on the palm of the hand, when a strong sensation of cold is experienced. A still more familiar illustration of this fact is exhibited in the rapidity with which the animal body loses heat when enveloped in damp or wet clothing. The evaporation of water produces a degeee of cold which is greater than that of other liquids, in exact proportion as the insensible or latent heat of its vapour exceeds theirs. In the attenuation or rarefaction of gases similar phenomena occur.

It has been found that evaporation proceeds much more rapidly from the surface of fluids in a vacuum than in the atmosphere. Water may be easily frozen by introducing a surface of sulphuric acid unver the receiver of an air-pump, over which is placed a capsule filled with water, so that the vapour arising from the latter may be immediately absorbed by the former. After a few strokes of the piston the water is converted into a solid cake of ice. The acid operates by absorbing the aqueous vapours as soon as generated, and thus maintaining the integrity of the vacuum. Professor Leslie found that, when air is thus rarified 250 times, the surface of evaporation was cooled down 120° in winter; and when only 50 times, a depression of 80° or even 100° took place. "Sulphuric acid is capable of congealing more than 20 times its weight of water before it has imbibed nearly its own bulk of that liquid, or has lost about ⅙th of its refrigerating power." (Ure.) Sulphuric acid, which has become diluted in this way, may be reconcentrated by heat. Any substance having a great tendency to absorb moisture may be substituted for the sulphuric acid. Fused chloride of calcium, quicklime, nitrate of magnesium, chloride of zinc, and oatmeal (dried nearly to brownness before a common fire), have been used for this purpose. Again, instead of employing an air-pump, a vacuum may be produced by the agency of steam, afterwards condensed by the affusion of cold water.

A pleasing philosophical toy, illustrative of the evaporative power of a vacuum, is the 'CRYOPHORUS,' or 'FROST-BEARER,' of Dr. Wollaston. This instrument consists of two small glass globes, united by a tube, one of which is partly filled with water. The whole apparatus is perfectly free from air, and is, consequently, filled with attenuated aqueous vapours. No sooner is the pressure removed as by plunging the empty ball into a freezing mixture (which condenses the vapour), than rapid evaporation commences, and the water in the other ball is frozen in two or three minutes.



Even in hot climates ice may be produced under favorable circumstances by evaporation. On the open plains, near Calcutta, this is effected by exposing a thin stratum of water to the atmosphere, during the fine clear nights of December, January, and February. The pans are made of porous earthenware, and water is poured in to the depth of about 1½ inch. A large number of these vessels are arranged in an excavation in the ground, 30 or 40 feet square and 2 feet deep, the bottom of which is covered, to the depth of 10 or 12 inches, with sugar canes or the stalks of Indian corn. At sunrise the pans are visited, the ice separated from the water, and packed as tight as possible in a deep cavity or pit, well screened from the heat.

Several machines have recently been invented by which water is frozen in large quantities, by exposure to condensed air in the act of its subsequent expansion. They are worked by either hand or steam power. The refrigerating apparatus invented by Mr. Kirk, of the Bathgate Paraffin Works, acts on this principle; and it does its work so efficiently that it produces a cooling effect equivalent to two tons of ice every twenty-four hours, at a very small expenditure of fuel. A small model worked by hand will readily freeze mercury. Kirk's apparatus is used at Bathgate to cause the crystallisation of solid paraffin from the heavy paraffin oils. Formerly, a machine, acting by the evaporation of ether, was employed for the same purpose.

For the production of an extremely low temperature, such as is required for the liquefaction of some gases, Faraday employed solid carbonic acid mixed with a little ether.

In the production of ice, or an extreme degree of cold, by saline mixtures, the salts should be in the crystallised state, and as rich as possible in water, but without being in the least damp. They should also be coarsely pulverised at the time of using them, and should not be mixed until immediately before throwing them into the liquid ingredients. The mixture should be made in a thick vessel, well clothed, to prevent the accession of external heat; and the substance to be acted on should be contained in a very thin vessel, so as to expose it more fully to the action of the mixture. On the large scale, a vessel called a '**FREEZING POT**' or '**SABOTIÉRE**' is commonly employed. The following table, though founded on experiments made more than 50 years ago by Mr. Walker, gives full and accurate information on the subject of freezing mixtures:—

TABLE *exhibiting a few of the most useful* FRIGORIFIC MIXTURES. *Drawn up from actual experiments performed by* MR. WALKER.

Ingredients.		Thermometer sinks.	Deg. of cold produced.
Snow *or* pounded ice Chloride of sodium	2 parts 1 „	From any temperature. to — 5°	—
Snow *or* pounded ice Chloride of sodium Sal ammoniac	5 „ 2 „ 1 „	to — 12°	—
Snow *or* pounded ice Chloride of sodium Nitrate of ammonia	12 „ 5 „ 5 „	to — 25°	—
Snow Hydrochloric acid (*concentrated*)	8 „ 5 „	From + 32° to — 27°	59°
Snow Crystallized chloride of calcium	2 „ 3 „	From + 32° to — 50°	82°
Sal ammoniac Nitrate of potassa Water	5 „ 5 „ 16 „	From + 50° to + 10°	40°
Nitrate of ammonia Water	1 „ 1 „	From + 50° to + 4°	46°
Nitrate of ammonia Carbonate of soda Water	1 „ 1 „ 1 „	From + 50° to + 7°	57°
Phosphate of soda Nitrate of ammonia Diluted nitrous acid [1]	9 „ 6 „ 4 „	From + 50° to — 21°	71°
Sulphate of soda Hydrochloric acid	8 „ 5 „	From + 50° to 0°	50°
Snow Diluted nitrous acid [1]	3 „ 2 „	From 0° to — 46°	46°
Snow Sulphuric acid Water	2 „ 1 „ 1 „	From — 20° to — 60°	40°
Snow Crystallized chloride of calcium	1 „ 2 „	From 0° to — 66°	66°
Snow Crystallized chloride of calcium	1 „ 3 „	From — 40° to — 73°	33°
Snow Sulphuric acid Water	8 „ 5 „ 5 „	From — 68° to — 91°	23°

[1] *Fuming 'nitrous acid,'* 2 parts; *water*, 1 part; by weight.

Obs. The materials in the first column are to be cooled, previously to mixing, to the temperature required in the second, by the use of other mixtures.

REG'ULUS. A term applied by the alchemists to various metallic matters obtained by fusion; as REGULUS OF ANTIMONY, ARSENIC, &c. It is now obsolete.

REL'ISHES. See SAUCES.

REMIT'TENT. A term applied to fevers, and other diseases, which exhibit a decided remission in violence during the twenty-four hours, but without entirely leaving the patient, in which they differ from intermittents or agues.

REN'NET. *Syn.* RUNNET, PREPARED CALF'S MAW. The fourth or true digesting stomach of the calf, freed from the outer skin, fat, and useless membrane, washed, treated with either brine or dry salt for a few hours, and then hung up to dry. When well prepared, the dried '*vells*' somewhat resemble parchment in appearance.

Uses, &c. Rennet is employed to curdle milk. A piece of the requisite size is cut off, and soaked for some hours in whey or water, after which the whole is added to the milk for curdling, slightly warmed, and the mixture is slowly heated, if necessary, to about 122° Fahr. In a short time after this temperature has been attained, the milk separates into a solid white coagulum (curd), and into a yellowish, translucent liquid (whey). Two square inches from the bottom of a good 'vell' are sufficient for a cheese of 60 lbs. It is the gastric juice of the stomach that operates these changes. The stomachs of all sucking quadrupeds possess the same properties. See CHEESE.

Rennet, Liquid. *Syn.* ESSENCE OF RENNET. *Prep.* From fresh rennet (cut small), 12 oz.; common salt, 3 oz.; knead them together, and leave the mixture at rest, in a cool place, for 5 or 6 weeks; then add, of water, 18 oz.; good rum or proof spirit, 2 oz.; lastly, digest for 24 hours, filter, and colour the liquid with a little burnt sugar.

Obs. 2 or 3 teaspoonfuls will curdle a quart of milk. Some persons use white wine instead of water, with simple digestion for a day or two.

RES'IN. *Syn.* RESINA, L. This name is applied to many vegetable principles composed of the elements carbon, hydrogen, and oxygen. The resins (RESINÆ) cannot be very accurately defined, but we may in a general way describe them as substances which are solid at ordinary temperatures, more or less transparent, inflammable, readily fusible, do not volatilise unchanged, become negatively electrified by rubbing; are insoluble in water, but soluble in alcohol; mostly inodorous, and readily incorporated with fatty bodies by fusion. Their sp. gr. varies from ·9 to 1·2. According to Liebig, they are oxidised essential oils. Common resin, rosin, or colophony, and the shellac of which sealing-wax is made, are familiar examples of these substances. (See *below.*)

Resin, Black. *Syn.* ROSIN‡, BLACK R.‡, COLOPHONY; RESINA NIGRA, COLOPHONIA, L. What remains of turpentine after the oil has been distilled. When this substance, whilst still fluid, is agitated with about 1-8th part of water, it forms the yellow resin of pharmacy. *Used* for violin bows, dark-coloured ointments, varnishes, &c.

Resin, Yel'low. *Syn.* YELLOW ROSIN‡, WHITE R.‡; RESINA FLAVA, RESINA (Ph. L.), L. Detergent. *Used* in ointments, plasters, &c. (See *above.*)

RES'INOIDS. *Syn.* RESINOUS EXTRACTS CONCENTRATED E.; EXTRACTA RESINA, L. Under this head, the so-called 'Eclectics,' who form a numerous class among American physicians, place their most important 'concentrated remedies.' "Viewed as pharmaceutical preparations eligible for use in medicine, though not purified so as to rank as distinctive proximate principles, these are very appropriately named 'resinous extracts,' or 'resins.' The term 'resinoid,' so commonly used, is less appropriate to the class, implying, as it does, a resemblance to resins, while all of these are either resins, oleo-resins, or more or less mixed proximate principles possessing no real resemblance to the class of resins." (Parrish.) Most of them are prepared from plants indigenous to North America, by precipitating a strong alcoholic tincture with water. They are all brought to the condition of powder, those which are naturally soft and oily being mixed with a sufficient quantity of sugar of milk, or other dry material. One of these eclectic remedies has been introduced into regular practice. See PODOPHYLLIN.

RESOLV'ENTS. *Syn.* DISCUTIENTS; RESOLVENTIA, L. Substances or agents which discuss or resolve inflammatory and other tumours. See DIGESTIVES.

RESPIRA'TION. The peculiar function by which the blood is submitted to the action of the air, for the purpose of removing carbonic acid, and restoring its vitality by the absorption of atmospheric oxygen.

The air expired from the lungs is found to have undergone a most remarkable change. It is now loaded with aqueous vapour, whilst a considerable portion of its oxygen has disappeared, and its place is supplied by about a like volume of carbonic acid. It is no longer capable of supporting animal life, and even a lighted taper plunged into it is immediately extinguished. In the mean time, the 'venous blood' which entered the lungs from the right chambers of the heart has lost its dingy hue, and has acquired the rich florid colour which is characteristic of 'arterial blood.' In this state it is returned to the left chambers of the heart, and is propelled by that organ to every part of the body, from which it passes by the capillaries to the veins, and by these again to the heart and lungs, to undergo the same changes and circulation as before. The carbon and hydrogen of the blood, ultimately derived from the food, are, in this course, gradually converted into carbonic acid and water, by a species of slow combustion; but how these changes are effected is not definitely ascertained.

The lungs, as is well known, receive the atmospheric air through the trachea or windpipe. At the root of the neck this divides into two branches, called bronchi, and each bronchus, upon entering its respective lung, divides into an infinity of small tubes. The latter terminate in small pouches, called the air-cells, and a number of these little air-cells communicate together at the extremity of each small tube. The number of air-cells in the two lungs has been estimated at 1,744,000,000, and the extent of the membrane which lines the cells and tubes together at 1500 square feet. (Dr. Addison.) Under ordinary circumstances, from 22 to 43 cubic inches of air are thrown out at each expiration; but, by a forced effort, 50 or 60 inches are ordinarily expelled. The number of respirations per minute in health, when the individual is tranquil and undisturbed, is about 15. Exercise increases this number. See FOOD, NUTRITION, &c.

Respiration, Artificial. Various means have been adopted for this purpose, among which blowing air into the lungs is, perhaps, that generally adopted. A better, and, in general, a much more efficient method, is as follows:—Powerful but not violent pressure is made upon the sides of the chest and upon the abdomen at the same time, by which the cavity of the thorax is diminished, and the air contained in the lungs is expelled; the compression is then suddenly withdrawn, when the elasticity of the ribs causes them to resume their old expanded positions; the chest is again enlarged, a partial vacuum is formed, and air rushes into the lungs, to be again expelled by pressure upon the ribs and abdomen as before. By this means artificial respiration may be kept up for a great length of time, without the use of bellows, or any other apparatus. The chief principle of Dr. Marshall Hall's so-called 'ready method' is the postural performance of artificial respiration. The patient is first placed gently on the face, and then turned on the side; then on the face again, alternately; these measures being repeated deliberately, efficiently, and perseveringly, fifteen times in the minute. When the prone position is resumed, equable, but efficient, pressure is applied along the spine; this pressure is removed immediately before rotation on the side.

The 'Silvester method,' invented by Dr. Henry Silvester, is now acknowledged to be far more effective than Dr. Hall's method, and is adopted by the Royal Humane Society for the restoration of the apparently drowned. It consists in laying the patient on the back, slightly raising the head and shoulders, drawing the tongue forwards, and keeping it so by passing an elastic band over it and under the chin. The arms are then grasped just above the elbows, and drawn gently upwards until they meet above the head (this is for the purpose of drawing air into the lungs), keeping the arms in that position for two seconds. The patient's arms are then turned down, and pressed gently and firmly for two seconds against the sides of the chest (this is for the purpose of pressing the air out of the lungs). Artificial breathing is thus carried on. These efforts are repeated fifteen times in a minute, until a spontaneous effort to respire is perceived. During the employment of these means the nostrils are excited with snuff or smelling salts, or the throat is tickled with a feather. After natural breathing has been restored, warmth and circulation are induced by wrapping the body in hot blankets, applying bottles or bladders of hot water, heated bricks, &c., to the pit of the stomach, the armpits, between the thighs, and to the soles of the feet, and by rubbing the limbs upwards firmly and energetically.

REVALEN'TA ARABICA. A mixture of the red Arabian or Egyptian lentil with barley flour, and a little sugar or salt. ('Lancet.') See LENTIL and REVALENTA.

REVERB'ERATORY FURNACE. See FURNACE.

REVIV''ER. *Prep.* 1. (BLACK REVIVER, PARIS'S ANTICARDIUM.) — *a.* Blue galls (bruised), 4 oz.; logwood and sumach; of each, 1 oz.; vinegar, 1 quart; macerate in a closed vessel, at a gentle heat, for 24 hours, then strain off the clear, add iron filings and green copperas, of each, 1 oz., shake it occasionally for a week, and preserve it in a corked bottle.

b. Galls, 1 lb.; logwood, 2 lb.; boil for 2 hours in water, 5 quarts, until reduced to a gallon, then strain, and add of green copperas, ¼ lb. *Used* to restore the colour of faded black cloth.

2. (BLUE REVIVER.) From soluble Prussian blue, 1 oz.; dissolved in distilled water, 1 quart. *Used* for either black or blue cloth.

RHAM'NIN. *Prep.* Express the juice from buckthorn berries scarcely ripe, which is to be rejected; boil the cake or residue with water, strain with pressure, and filter the liquid whilst hot; crude rhamnin will be deposited as the liquid cools, which, by solution in boiling alcohol and filtration, may be procured in crystals.

Obs. Buckthorn juice (succus rhamni) "the juice of the fruit of *Rhamnus catharticus* (Linn.)," is officinal in the Ph. L.

RHAT'ANY. *Syn.* RHATANY ROOT; KRAMERIÆ RADIX (B. P.); KRAMERIA (Ph. L. E. & D.), RHATANIÆ RADIX, L. "The root of *Krameria triandria.*" (Ph. L.) It is stomachic, and powerfully astringent and styptic.—*Dose.* 20 to 60 grs., either in powder or made into a decoction or infusion. It is much employed in tooth powders, to fix the teeth when they become loosened by the recession of the gums, and also for improving the natural red colour of the lips and gums. A saturated tincture or fluid extract, made with brandy, forms the 'wine-colouring' used by the Portuguese to give roughness, colour, and tone to their port wine. Hard extract of rhatany is also much employed for the same purpose.

RHE'IN. *Syn.* CHRYSOPHANIC ACID. The yellow colouring principle of rhubarb.

RHEU'MATISM. *Syn.* RHEUMATISMUS, L. An affection of the joints, and of the external muscular, tendinous, and fibrous textures of the body, attended with swelling, stiffness, and great pain. Acute rheumatism or rheumatic fever,—arthritis, inflammation of the synovial membrane, or rheumatic gout,—sciatica, or rheumatism of the cellular envelope of the great sciatic nerve, affecting the hip,—and lumbago, or rheumatism of the loins, are varieties of this disease.

The treatment of rheumatism consists in the administration of purgatives and diaphoretics or sudorifics, accompanied by tonics, as bark, quinine, &c. Calomel with opium, and iodide of potassium, have also been frequently and successfully employed in this complaint. Of late years the administration of the bicarbonate, citrate, or nitrate of potassa, in rather large doses, has been strongly recommended, and in numerous cases adopted with success. Lemon juice, liberally taken, has also proved useful in suddenly cutting short severe attacks of certain forms of rheumatism. The compound powder of ipecacuanha, taken at night, will generally promote the ease and sleep of the patient, and, by its sudorific action, tend considerably to hasten a cure. Where possible, a dry atmosphere and a regular temperature should be sought, since a damp atmosphere, and, indeed, exposure to damp under any form, are the principal causes of rheumatism. Stimulating embrocations, blisters, frictions, and, above all, the hot or vapour bath, are also frequently serviceable in rheumatism, especially in lumbago and casual attacks arising from cold. The daily use of oranges, or of lemon juice diluted with water, has been found, in the majority of cases, to lessen the susceptibility of those who employ them to attacks of rheumatism and rheumatic gout arising from a damp situation or exposed to the weather. See LEMON JUICE.

RHO'DIUM. A whitish metal discovered by Wollaston, in 1803, associated with palladium in the ore of platinum.

It is chiefly employed for tipping the nibs of metallic pens ('rhodium' or 'everlasting pens'). A very small quantity added to steel is said to improve its closeness, hardness, and toughness, and to render it less easily corrodible by damp.

RHU'BARB. *Syn.* RHEI RADIX (B. P.); RHEUM (Ph. E. & D.), RHEUM—Sinense (Ph. L.), RHABARBARUM†, RHŒUM†, L. "The root of uncertain species of Rheum." (Ph. L.) According to Dr. F. Farre, the term 'sinense' (Chinese), employed by the London College, "was placed after 'rheum,' to include the so-called Russian and East Indian rhubarbs, which are considered to be the produce of China and Chinese Tartary, and to exclude European, Himalayan, &c."

Three principal varieties of rhubarb are known in this country:—

Russian or Turkey rhubarb is the produce of six-year-old plants of the mountain declivities of Chinese Tartary; and its principal excellence depends on its more careful preparation, and subsequent garbling, both before its selection for the Russian market, and after its arrival at Kiachta, and again at St. Petersburg. At Kiachta all pieces of a porous, gray, or pale colour are rejected, the whole being pared and perforated, the better to determine the quality of the interior portion. At St. Petersburg the pieces are again carefully examined and garbled, and are, finally, packed in close cases or chests, which are rendered air-tight by the application of pitch on the outside.

East India or Chinese rhubarb is the produce of the locality just referred to, as well as of other parts of China. It is obtained from younger plants, and its preparation and subsequent selection or garbling is conducted with less care.

English rhubarb is principally produced at Banbury, Oxfordshire, [from the *Rheum Rhaponticum*. It is cut and dressed up after the manner of Turkey rhubarb, for which it is sold by itinerant vendors, habited as Turks.

Qual. Russian or Turkey rhubarb occurs in irregular plano-convex or roundish lumps, perforated with a circular hole; it possesses a yellow colour outside; when recently broken, the inside presents a rich mottled appearance, and evolves a peculiar and somewhat aromatic odour. It is firm, compact, heavy, perfectly free from moisture, and easily grated. Its taste is bitter, slightly astringent, and subacid; and when chewed it feels gritty, and tinges the saliva of a beautiful yellow colour. It breaks with a rough, hackly fracture, is easily pulverised, and its powder is of a bright buff-yellow colour.

East India, Canton, or Chinese rhubarb is in flat pieces, seldom perforated, and its taste and odour are stronger than the other. It is also heavier, tinges the saliva of an orange-red hue, and when pulverised the powder is redder than that of Russian rhubarb.

English rhubarb possesses all the preceding qualities in a greatly less degree. It is light and spongy, does not feel gritty between the teeth, its taste is mucilaginous, and its powder has a peculiar pinkish hue not present in either of the other varieties of rhubarb. As a medicine, it possesses little value, and is chiefly employed to adulterate East India and Turkey rhubarb.

Prop. &c. Rhubarb is astringent, stomachic, and purgative. In small doses, its operation is principally or wholly confined to the digestive organs; in larger ones, it first acts as a mild aperient, and, afterwards, as an astringent; hence its value in diarrhœa. It has also been used externally to promote the healing of indolent sores.—*Dose.* As a stomachic, 1 to 5 grs.; as a purgative, 10 to 20 grs. It is most effective when chewed, or in the form of powder produced by grating it.

Rhubarb, Roast'ed. *Syn.* BURNT RHUBARB; RHEUM USTUM, L. *Prep.* 1. Rhubarb, in coarse powder, is carefully and regularly heated in a smooth shallow iron disc, with constant stirring, until its colour has changed to a moderately dark brown, when it is allowed to cool out of contact with the air; when cold, it is reduced to powder, and at once put into a well-closed bottle.

2. (Hoblyn.) Roast powdered rhubarb in an iron vessel, constantly stirring, until it becomes almost black, then smother it in a covered jar. —*Dose.* 5 to 10 grs.; as an astringent in diarrhœa, and a tonic in dyspepsia, &c. Prof. Procter, the well-known American pharmaceutist, recommends the rhubarb to be only roasted to a 'light brown.'

RICE. *Syn.* ORYZA, L. The seed of *Oryza sativa*, a plant of the natural order *Graminaceæ*. Several varieties are known in commerce, distinguished by the name of the country or district which produces them. The finest is that imported from Carolina.

As an article of diet, rice is highly nutritious and wholesome when combined with fresh animal or other nitrogenized food; but, owing to the very small quantity of 'flesh-formers' which it contains, and its comparative destitution in saline matter, it is totally unfit to form the principal portion of the diet of the working classes, or the poorly fed, at least in this climate. "It does not appear so well calculated for European constitutions as the potato, for we find the poor constantly reject it when potatoes can be had." This preference evidently depends on something more than mere whim or taste; for some years ago, when rice was substituted for potatoes in some of our union workhouses, the most serious consequences followed. In one of these, nine or ten deaths from scurvy and allied diseases occurred in a single fortnight. Large quantities of rice are annually imported into Britain, and used by distillers in the manufacture of spirits.

RICINO'LEIC ACID. A variety of oleic acid discovered in saponified castor oil.

RICK'ETS. *Syn.* RACHITIS, L. A disease, generally confined to childhood, characterised by a large head, prominent forehead, protruded breast bone, flattened ribs, tumid belly, emaciated limbs, and great general debility. The bones, more particularly those of the spine and legs, become distorted, and exhibit a deficiency of earthy matter; the stools are frequent and loose, a slow fever succeeds, with cough, painful and difficult respiration, and, unless the child rallies, atrophy is confirmed, and death ensues. When recovery takes place, there is always more or less deformity left.

The common causes of rickets are bad nursing, exposure to damp and cold, and insufficient nutrition, arising from the use of white bread containing alum, or any of the pernicious compounds vended under the names of 'FARINACEOUS FOOD,' 'INFANTS' F.,' 'PATENT F.,' &c. Rickets, like caries of the bones, is a disease which is scarcely known amongst infants whose pap is made of pure wheaten bread, and whose mothers or nurses consume the same themselves.

The treatment of rickets depends more on proper domestic management than on direct medication. Careful nursing, warm dry clothing, thorough ventilation, moderate exercise, and, above all, a light nutritious mixed diet abounding in nitrogenous matter and the phosphates, will do much to effect a cure. To these may be added the administration of the milder chalybeate tonics, bark, or quinine, with occasional doses of some mild aperient, as phosphate of soda, or, when there is diarrhœa, of rhubarb or some other tonic purge. The administration of small doses of phosphate of lime or of dilute phosphoric acid, frequently repeated, or, still better, the daily use of jelly made of pure ivory or bone shavings, will often effect wonders in those cases in which the bones are implicated from an apparent deficiency of earthy matter. See BREAD, FARINA, NURSING, &c.

RING'WORM. *Syn.* SCALD-HEAD; PORRIGO, L. The common ringworm, the PORRIGO SCUTULATA of medical writers, is a disease that appears in circular patches of little pustules, which afterwards form scabs, leaving a red pimply surface, and destroying the bulbs of the hair in its progress. It spreads rapidly, and is very infectious, often running through a whole school. It chiefly affects the neck, forehead, and scalp of weakly children, and frequently arises without any apparent cause, but, in general, may be traced to uncleanness, or contact with parties suffering from the disease.

The treatment of ringworm consists in shaving the part, and keeping it clean with soap and water, at the same time that an occasional mild saline aperient is administered, and a light, nutritious diet, of which the red meat and ripe fruits should form a portion, be rigorously adhered to. When the scabbing commences, dressings of tar ointment, or of the ointment of nitrate or red oxide of mercury, or a mixture of equal parts of the first and either the second or third, should be applied, in each case diluting the mixture with sufficient lard to adapt it to the state of irritability of the part. During this treatment the head should be covered with an ordinary nightcap, or some simple bandage, and not enveloped in a bladder or oil-skin case, as is commonly the practice, since the complete exclusion of atmospheric air tends to aggravate the disease.

RI''PENING. See BREWING, MALT LIQUORS, WINE, &c.

ROAST'ING. Alexis Soyer recommends, "as an invariable rule," that "all dark meats, such as beef and mutton, should be put down to a sharp fire for at least fifteen minutes, until the outside has acquired a coating of osmazome, or condensed gravy, and then removed back, and allowed to cook gently. Lamb, veal, and pork, if young and tender, should be done at a moderate fire. Veal should even be covered with paper."

"Very rich meat, if covered with paper, does not require basting. Fowls, &c., should be placed close to the fire, to set the skin, and in about ten minutes rubbed over with a small piece of butter, pressed in a spoon. Meats, whilst roasting, should be dredged with flour, just at the time when the gravy begins to appear; the flour absorbs it, and forms a coating which prevents any more coming out. Hares and small game should be treated in the same manner."

Under ordinary circumstances as to the fire, and the distance between it and the joint, beef, mutton, and veal, take about ¼ hour per lb. in roasting. Lamb, poultry, and small game, require only 12 to 14 minutes per lb.; whilst veal takes fully 15 minutes, and pork takes from ¼ hour to 20 minutes, as they must always be well done. The flesh of old animals requires more cooking than the flesh of young ones; and inferior, tough, and bony parts than the prime joints and pieces.

Roasting is not an economical method of cooking pieces of meat abounding in bone or tendinous matter, since the nutritious portion of these is either destroyed or rendered insoluble by the heat employed. Thus, the raw bones from a joint are capable of affording a rich and excellent basin of soup, highly nutritious; whilst the bones from a corresponding joint which has been roasted are nearly worthless when so treated. The same applies with even greater force to the gristly and tendinous portions. A dry heat either destroys them or converts them into a horny substance, unfit for food; whilst by boiling they are transformed into a highly succulent and nutritious article of food, besides affording excellent soup or jelly. Hence the policy of 'boning' meat before roasting or baking it; or, at all events, of removing the bony portion which would be most exposed to the action of the fire. See BONE and JELLY.

ROB. *Syn.* ROOB. A term, derived from the Arabic, formerly applied to the inspissated juice of ripe fruit, mixed with honey or sugar to the consistence of a conserve of thin extract. Rob of elder-berries (ELDER ROB; ROOB SAMBUCI), juniper berries (JUNIPER ROB; ROOB JUNIPERI), mulberries (MULBERRY ROB; ROOB DIAMORUM), and walnuts (WALNUT ROB; ROOB DYACARYON), with a few others, are still found in some of the foreign Pharmacopœias.

ROCK. The popular name of a sweetmeat formed of sugar boiled to a candy, and then poured upon an oiled slab, and allowed to cool in the lump. It is variously flavoured.

ROCK CRYS'TAL. Native crystallised silica. See QUARTZ.

ROCK OIL. See PETROLEUM.

ROCK SOAP. A native silicate of alumina; used for crayons, and for washing cloth.

ROCK'ETS. (In pyrotechny.) *Prep.* The CASES.—These are made of stout cartridge paper, rolled on a mould and pasted, and then throttled a little below the mouth, like the neck of a phial. The diameter should be exactly equal to that of a leaden ball of the same weight, and the length should be equal to 3½ times the internal diameter. They are filled with the following mixtures, tightly driven in; and when intended for flight (SKY-ROCKETS), they are 'garnished,' and affixed to willow rods to direct their course.

The COMPOSITION.—1. (Marsh.)—*a.* For 2-oz. rockets. From nitre, 54½ parts; sulphur, 18 parts; charcoal, 27½ parts; all in fine powder, and passed through lawn.

b. For 4-oz. do. From nitre, 64 parts; sulphur, 16 parts; charcoal, 20 parts; as the last.

c. For ½-lb. to 1-lb. do. From nitre, 62¾ parts; sulphur, 15¾ parts; charcoal, 21½ parts.

2. (Ruggieri.)—*a.* For rockets of ¾-inch diameter. From nitre, 16 parts; charcoal, 7 parts; sulphur, 4 parts.

b. For ¾ to 1½-inch rockets, use 1 part more of nitre.

c. For 1¾-inch rockets, use 2 parts more of nitre.

d. By using 1 part less of charcoal and adding respectively 3, 4, and 5 parts of fine steel filings, the above are converted into 'BRILLIANT FIRES.'

e. By the substitution of coarse cast-iron borings for filings, and a further omission of 2 parts of charcoal from each, the latter are converted into 'CHINESE FIRE.'

HAND-ROCKETS and GROUND-ROCKETS are usually loaded with nothing but very fine meal gunpowder and iron or zinc filings or borings.

After SKY-ROCKETS and WATER-ROCKETS are charged, a piece of clay is driven in, through which a hole is pierced, and the 'head' or 'garniture' filled with stars, and a little gunpowder is then applied. See FIRES and STARS.

ROLLS. A variety of fancy bread, generally in the form of small semicylindrical cakes, prepared by the bakers, and intended to be eaten hot for breakfast. They differ from ordinary fine or French bread, as it is called, chiefly in containing more water. Some are wetted up with milk-and-water, and are hence called 'milk rolls.'

ROLL (Wine). *Prep.* Soak a French roll or sponge-biscuit in raisin, marsala, or sherry wine, surround it by a custard or cream thickened with eggs, and add some spice and ornaments.

ROOT. *Syn.* RADIX, L. That part of a plant which imbibes its nourishment from the soil or medium in which it grows. In popular language, bulbs, corms, tubers, &c., are improperly included under this term.

RO'PINESS. See MALT LIQUORS and WINES.

ROPOPH'AGON. *Prep.* From yellow soap, sliced, 1 oz.; soft soap (finest), 3 oz.; melt them by the heat of hot water, then allow them to cool a little, and stir in of oil of cloves, ½ dr.; essence of ambergris, 10 drops. It is kept a month before sale. *Used* for shaving.

ROSE. *Syn.* Rosa, L. The typical genus of the natural order *Rosaceæ*. It includes numerous species greatly prized as garden plants.

Rose, Cabbage. *Syn.* Hundred-leaved rose; Rosæ centifoliæ petala (B. P.), Rosa centifolia (Ph. L. & E.), L. "The fresh petals" (Ph. L.) of this species are used in medicine. Odorous and slightly astringent and laxative. See Waters and Syrup.

Rose, Dog. The *Rosa canina*, or wild briar. See Hips.

Rose, French. *Syn.* Red rose; Rosæ gallicæ petala (B. P.), Rosa gallica (Ph. L. E. & D.), L. "The fresh and dried unexpanded petals" (Ph. L.) of this species are officinal. The white claws of the petals are removed before drying them.

Uses, &c. The red rose is an elegant astringent and tonic, and, as such, is used as the basis of several pharmaceutical preparations. See Confection, Honeys, Infusion, and Syrup.

ROSE'MARY. *Syn.* Rosmarinus (Ph. L. E. & D.). The flowering tops of *Rosmarinus officinalis* (Linn.), or the common rosemary of our gardens, are officinal in the Ph. E. & D.; as is also the oil (oleum rosmarini) in the B. P. and Ph. L. The odour of both is refreshing, and they are reputed carminative, emmenagogue, and neurotic. The dried leaves are occasionally used by the hysterical and hypochondriacal as a substitute for China tea. The oil is an ingredient in Hungary water, and is much used in various cosmetic compounds, under the presumption of its encouraging the growth of hair and improving its quality.

ROSE PINK. See Red Pigments.

RO'SIN. See Resin.

ROSY-DROP. See Acne.

ROT. *Syn.* Greatrot, Hydrophic r., Sheep r., Wet r. A disease peculiar to sheep, produced by a humid atmosphere, wet pasturage, and exposure to the weather. The leading symptoms are loss of flesh and vivacity; the lips and tongue look vivid, and the eyes sad and glassy; the pelt comes off on the slightest pull; the breath is fetid, and the urine highly coloured and scanty; and there is either black purging or obstinate costiveness. The treatment consists in a change to a dry warm situation, and a dry diet, consisting of oats, barley meal, tail-wheat, &c., to which some turnips, carrots, or mangel wurzel, may be added, with a liberal supply of common salt, and a few grains of sulphur, daily. These last two substances form the active ingredients in Flesh's 'Patent Restorative.'

ROT (in Timber). See Dry Rot.

ROTA'TION (of Crops). The rotation or succession of crops is absolutely necessary for the successful and economical cultivation of the soil. Crops have been divided by agriculturists into exhausting crops, restoring crops, and cleaning crops. The most exhausting crops are usually considered to be those of corn, but all those that are allowed to ripen their seed, and which are carried off the ground are also exhausting, but in different degrees. Even clover, tares, and grass cut green are considered as exhausting, but in a less degree than those that are allowed to ripen. Restoring crops are such as are allowed to decay upon the ground, or are consumed upon it by domestic animals. Cleaning crops are such as are grown in drills, and undergo the usual operations of weeding, hoeing, &c.; the majority of these may also be regarded as exhausting crops. An exhausting crop should always be followed by a restoring or a cleaning crop; or, where possible, by both combined. Crops should also succeed each other in such a way that the soil may not be exhausted of any one particular kind of nutriment. This is best effected by so rotating the crops that plants which are nearly allied should not succeed each other on the same soil, or, at all events, not more than once. See Agriculture, Soils, &c.

ROT'TEN STONE. See Tripoli.

ROUGE. *Syn.* Toilet rouge; Rouge végétal, Rouge d'Espagne, Fr. *Prep.* Wash safflower (any quantity) until the water comes off colourless; dry and pulverise it, and digest the powder in a weak solution of crystallised carbonate of soda; then place some fine cotton-wool at the bottom of a porcelain or glass vessel, pour the filtered tinctorial solution on this, and throw down the colouring matter, by gradually adding lemon juice or white-wine vinegar, until it ceases to produce a precipitate; next wash the prepared cotton in pure cold water, and dissolve out the colour with a fresh solution of soda; to the new solution add a quantity of finely powdered talc or French chalk, proportionate to the intended quality of rouge; mix well, and precipitate with lemon juice, as before; lastly, collect the powder, dry it with great care, with as little heat as possible, and triturate it with a very small quantity of oil of olives, to render it smooth and adhesive.

Obs. According to the best authorities, this is the only article which will brighten a lady's complexion without injuring the skin. The relative fineness and proportion of talc employed determines the quality of the rouge. It is applied by means of a camel-hair pencil, a small 'powder puff,' or a hare's foot. It is also employed under the form of 'pommade' and 'crepons.' The last of these consist of pieces of white woollen crape, upon which the colouring matter of the carthamus has been precipitated, instead of upon the talc, noticed above.

The following articles also pass under the name of rouge, and are used for the purposes named after each:—

Rouge, Brown-red. Jeweller's rouge.

Rouge, Chinese Card. This is said to be a 'carthamate of soda;' it is colourless when applied, but, being decomposed by the acid secretions of the skin, acquires a most beautiful rose-like tint. (O'Shaughnessy.)

Rouge, Jeweller's. Sesquioxide of iron prepared by calcination. *Used* to polish gold, &c.

Rouge, Liquid. The red liquid left from the preparation of carmine; or, a solution of carmine in weak carbonate of potash water, or of pure rouge in alcohol acidulated with acetic acid.

Rouge Indienne. The terra persica, or Indian red; imported from Ormuz.

Rouge de Prusse. Light red or burnt yellow ochre. See Red Pigments.

Rouge, Spanish Lady's. This is cotton wool which has been repeatedly wetted with an ammoniacal solution of carmine, and dried. It is applied like 'rouge crepons.'

Rouge d'Athenes, Vert. *Syn.* Pure rouge. See Carthamine.

ROUGH'ENING. See Wines.

RUBEFA''CIENTS. *Syn.* Rubefacientia, L. Substances or agents which, when applied for a certain time to the skin, occasion a redness and increase of heat, without blistering. They act as counter-irritants. Mustard, powdered ginger (both made into a paste with water), hartshorn and oil, and ether and spirit of wine (when their evaporation is prevented), are familiar examples of this class of remedies.

RUBE'OLA. See Measles.

RUBIA'CIN. An orange-coloured substance, obtained from madder.

RUBID'IUM. [Eng., L.] A metal belonging to the alkaline group discovered by Bunsen and Kirchhoff by means of spectrum analysis. It is found in many mineral waters associated with cæsium.

RU'BY. See Gems and Pastes.

RUE. *Syn.* Rutæ folia, Ruta (Ph. L. & E.), L. "The leaf of *Ruta graveolens.*" (Ph. L.) A powerful antispasmodic, diuretic, and stimulant. It is also reputed nervine and emmenagogue. The fresh leaves are powerfully acrid, and even vesicant; but they become milder in drying.—*Dose.* Of the powder, 15 to 30 grs., twice or thrice daily; in hysteria, flatulent colic, &c. See Infusion and Oils (Volatile).

RUM. *Syn.* Spiritus Jamaicensis, Spiritus sacchari, L. An ardent spirit obtained by distillation from the fermented skimmings of the sugar-boilers (syrup scum), the drainings of the sugar-pots and hogsheads (molasses), the washings of the boilers and other vessels, together with sufficient recent cane juice or wort, prepared by mashing the crushed cane, to impart the necessary flavour. The sweet liquor, before fermentation, commonly contains from 12 to 16% of saccharine, and every ten gallons yields from one to two gallons of rum.

The average strength of rum, as imported into this country, is about 20 o.p. Like all other spirits, it is colourless when it issues from the still, but owing to the taste of the consumer the distiller is compelled to colour it before it leaves his premises.

Obs. Rum is imported from the West Indies. The best comes from Jamaica, and is hence distinguished by that name. Leeward Island rum is less esteemed. The duty on rum is 10s. 2d. per proof-gallon if imported direct from any of the British Colonies (Colonial rum), but 10s. 5d. if from any other part of the world (Foreign rum). The consumption of rum has long been declining in England; its place being chiefly supplied by gin. Rum owes its flavour to a volatile oil and butyric acid, a fact which the wary chemist has availed himself of in the manufacture of a butyric compound (essence of rum) for the especial purpose of enabling the spirit dealer to manufacture a factitious rum from malt or molasses spirit. In Jamaica it is usual to put sliced pine apples into the puncheons containing the finer qualities of rum, which is then termed pine-apple rum. See Alcohol, Spirit, &c.

RUPERT'S DROPS. These are made by letting drops of melted glass fall into cold water. By this means they assume an oval form, with a tail or neck resembling a retort. They possess this singular property, that if a small portion of the tail is broken off, the whole bursts into powder with an explosion, and a considerable shock is communicated to the hand.

RUP'TURE. See Surgery.

RUSKS. *Prep.* From 4 eggs; new milk and warm water, of each, ½ pint; melted butter and sugar, of each, ¼ lb.; yeast, 3 table-spoonfuls; beat well together with as much flour, added gradually, as will make a very light paste; let it rise before the fire for half an hour, then add a little more flour, form into small loaves or cakes 5 or 6 inches wide, and flatten them; bake these moderately, and, when cold, cut them into slices the size of rusks, and put them into the oven to brown a little. A nice tea-cake when hot, or, with caraways, to eat cold. Plain rusks are made by simply cutting loaves of bread into slices, and baking them in a slow oven to the proper colour.

RUS'MA. An arsenical iron pyrites, found in Galatia, which, when reduced to powder, and mixed with half its weight of quicklime, is used by the Turkish ladies to make their 'psilothrons,' or compounds to remove superfluous hair. See Depilatory.

RUST. *Syn.* Rubigo, L. The coating or film of oxide or carbonate which forms on the surface of several of the metals when exposed to a moist atmosphere; more particularly, that which forms on iron or steel (FERRI HYDRATE; HYDRATED SESQUIOXIDE OF IRON; FERRUGO, FERRI RUBIGO).

To prevent iron or steel goods rusting, it is merely necessary to preserve them from damp or moisture. In the shops, small articles in steel are, commonly, either varnished or enclosed in quicklime finely pulverised; large articles are generally protected with a coating of plumbago, or of boiled oil, or some cheap varnish, applied to them, previously gently heated. Surgical instruments are frequently slightly smeared with a little strong mercurial ointment, with the same intention.

Spots of rust may be removed from the surface of polished iron or steel by rubbing them with a little tripoli or very fine emery made into a paste with sweet oil; or, chemically, by a mixture of polisher's putty-powder with a little oxalic acid, applied with water. When the last is employed, the articles should be afterwards well rinsed in pure water, then wiped dry, and finished off with a warm and dry rubber, in order to remove every trace of acid.

RUTHEN'IUM. A metal, discovered by Claus, associated with iridium, in the residue from crude platinum, which is insoluble in aqua regia. It forms small angular masses, with a metallic lustre; is very brittle and infusible; resists the action of acids, but readily oxidises when heated in the air. Sp. gr. 8·6.

RYE. *Syn.* SECALE, L. The seed of *Secale cereale*, a gramineous plant, the native country of which is undetermined. It is a more certain crop and requires less culture and manure than wheat, and is hence largely cultivated in Germany, Russia, and the northern parts of Europe, where it is extensively employed for bread. When roasted, it is occasionally used as a substitute for coffee. It furnishes an excellent malt for the distillation of spirit, and is much used in the making of Hollands.

Rye, Spurred. See ERGOT.

SABADIL'LA. *Syn.* CEBADILLA, CEVADILLA, SABADILLA (B. P., Ph. E.), L. The dried fruit of *Asagræa officinalis*. A drastic and dangerous cathartic, occasionally used in tapeworm; and, externally, to destroy pediculi, but, even for this purpose, when the scalp has been denuded or ulcerated, it has sometimes caused death. It is now used chiefly as a source of VERATRINE.

SA'BLE. The *Mustella Zibellina* (Linn.), a small quadruped of the martin-cat family, found in Northern Asia. Its fur is remarkable for its fine quality and rich colour, and for the hairs turning with equal ease in every direction. The skins of the rabbit, cat, &c., dressed, painted, and lustred, are sold under the name of COMMON or MOCK SBALE.

SABOTIERE. [Fr.] An apparatus of peculiar construction, employed by the French confectioners for making ices. It consists of a pail to contain a freezing mixture, and an inner vessel for the creams to be iced. It may be used with a mixture of pounded ice and salt, or any other freezing mixture. The pail and cream vessel being loaded, and closely covered, an alternate rotatory motion is given to the apparatus by means of the handle, for 10 or 15 minutes, care being taken to occasionally scrape down the frozen portion of the cream from the sides, by means of a wooden spoon. See ICES and REFRIGERATION.

SACCHAR'IC ACID. *Syn.* OXALHYDRIC ACID†. A compound, resulting from the action of dilute nitric acid on sugar.

SAC'CHARINE. The technical name of the uncrystallisable sugar found in malt-wort.

SACCHARINE FERMENTATION. This occurs during the germination and kiln-drying of grain in the operation of malting, and in the mashing of malt in brewing. The sweetening of bread during its exposure to heat in the oven is also included under this head by many writers.

The substance which most powerfully excites the sugar fermentation was first shown by Payen and Persoz to be a peculiar principle, to which they have given the name of 'DIASTASE.' This is always present in good malt, and possesses the singular property of converting STARCH successively into gum (dextrin) and sugar, at a temperature ranging between 149° and 168° Fahr. During the action of this substance on starch, it is itself decomposed; and when the sugar fermentation ceases it is found to have entirely disappeared. It is the presence of diastase in malt which alone converts the starch of the grain into sugar during the operation of mashing with hot water; and hence the absolute necessity of employing water at the proper temperature, as on this depends the strength and sweetness of the wort, and consequently its fitness for undergoing the vinous fermentation, and for making beer. Vegetable albumen and gluten also possess the property of exciting the saccharine fermentation, but in a considerably inferior degree to diastase.

The sugar formed during the germination of seeds containing starch results from the action of diastase, and disappears as soon as the woody fibre (lignin), which has a similar constitution, is developed, forming the skeleton of the young plant. (Liebig.) See BREWING, DIASTASE, DEXTRINE, &c.

SACCHAROM'ETER. An instrument, similar in principle to the common spirit hydrometer, but so weighted and graduated as to adapt it for the indication of the richness of malt-worts in sugar, or saccharine, expressed in pounds per barrel, or the excess of gravity over that of water, the last being taken at 1000. See BREWING, SYRUP, WORT, &c.

SACH'ET. *Syn.* SACCULUS, L. Sachets (SACCULI) are little bags, containing dry substances, used for the external medication of parts, or for communicating agreeable perfumes to wearing apparel, drawers, furniture, lobster in two, open the tail, extract the meat in one piece, break the claws, cut the meat of both in small slices, about a quarter of an inch thick, and arrange these tastefully on the salad; next take out all the soft part from the belly, mix it in a basin with 1 teaspoonful of salt, ½ do. of pepper, 4 do. of vinegar, and 4 do. of oil; stir these well together, and pour the mixture on the salad; lastly, cover it with 2 hard eggs, cut into slices, and a few slices of cucumber." "To vary this, a few capers and some fillets of anchovy may be added, stirred lightly, and then served, either with or without some salad sauce. If for a dinner, ornament it with some flowers of the nasturtium and marigold."

SAL'EP. *Syn.* Salop, Saloop. The tuberous roots of *Orchis mascula*, and other allied species, washed, dried, and afterwards reduced to coarse powder. That imported from Persia and Asia Minor occurs in small oval grains, of a whitish-yellow colour, often semitranslucent, with a faint, peculiar smell, and a taste somewhat resembling gum tragacanth. It consists, chiefly, of bassorin and starch, is very nutritious, and is reputed aphrodisiac. It is employed in the same way as sago. A decoction of about 1 oz. of this substance in a pint of water was formerly sold at street-stalls. A tea made of sassafras chips, flavoured with milk and coarse brown sugar or treacle, was also sold in the same way, and under the same name.

French salep is prepared from the potato. Dr. Ure says that the *Orchis mascula* of our own country, properly treated, would afford an article of salep equal to the Turkey, and at a vastly lower price.

SAL'ICIN. $C_{13}H_{18}O_7$. A white, crystalline substance, discovered by Le Roux and Buchner, in the bark and leaves of several species of *Salix* and *Populus*. It occurs most abundantly in the white willow (*Salix alba*) and the aspen (*Salix helix*), but is also found in all the bitter poplars and willows. From willow bark which is fresh, and rich in salicin, it may be obtained by the cautious evaporation of the cold aqueous infusion.

Prep. 1. (Merck.) Exhaust willow bark by repeated coction with water, concentrate the mixed liquors, and, while boiling, add litharge until the liquid is nearly decoloured; filter, remove the dissolved oxide of lead, first by sulphuric acid, and afterwards by sulphuret of barium; filter, and evaporate, that crystals may form; the crystals must be purified by re-solution and recrystallisation.

2. As No. 1, but using a stream of sulphuretted hydrogen, to free the solution from lead.

3. (P. Cod.) To a strong filtered decoction of willow bark add milk of lime, to throw down the colour; filter, evaporate the liquor to a syrupy consistence, add alcohol (sp. gr. ·847), to separate the gummy matter, filter, distil off the spirit, evaporate the residuum, and set it aside in a cool place to crystallise; the crystals are purified by solution in boiling water, agitation with a little animal charcoal, and recrystallisation.

Prop., &c. Salicin forms white, silky needles and plates; it is intensely bitter; inodorous; neutral; non-basic; fuses at 230° Fahr., with decomposition; burns with a bright flame; is soluble in 5½ parts of water at 60°, and in much less at 212°; dissolves readily in alcohol; but is insoluble in ether. It is tonic, like sulphate of quinine, but less liable to irritate the stomach. It is given in indigestion and intermittent diseases, in from 5 to 10 gr. doses.

Pur. & tests.—1. It is entirely soluble in water and rectified spirit.—2. When strongly heated, it is wholly dissipated, and, if kindled, burns with a bright flame, leaving a bulky charcoal.—3. Its solution is absolutely neutral to test-paper.—4. Concentrated sulphuric acid causes it to agglutinate into resin-like lumps, with the accession of an intense blood-red colour.—5. When its aqueous solution is mixed with some hydrochloric acid, or dilute sulphuric acid, and the mixture is boiled for a short time, the liquid suddenly becomes turbid, and deposits SALIRETIN, under the form of a granular crystalline precipitate. This is characteristic.—6. No reagent deposits salicin without decomposition. See Salycylic and Salycylous Acids.

SAL'ICYL. C_7H_4O. A compound radical, forming the basis of the so-called SALICYL-COMPOUNDS, or SALICYL-SERIES. It is known only in combination. The volatile oil of meadow-sweet is a natural hydride of salicyl, a substance which, when artificially prepared, is better known under the name of SALYCYLOUS ACID. (See *below*.)

SALICYL'IC ACID. $H_2C_7H_4O_4$. A peculiar volatile, crystallisable acid, discovered by Piria. It is obtained by fusing salicylous acid with solid hydrate of potassa in slight excess, until the mixture turns white and gas is disengaged, and treating a solution of the residuum with hydrochloric acid, in slight excess, to separate the potassa; the salicylic acid separates in crystals, which are purified by solution in hot water. It may also be obtained from the oil of partridge-berry (*Gaultheria procumbens*), by acting on it with a strong and hot solution of potassa, and afterwards separating the acid as before. This oil is methylo-salicylic ether, or salicylate of oxide of methyl. In its general properties, salicylic acid closely resembles benzoic acid.

SALICYL'OUS ACID. $C_7H_6O_2$. *Syn.* Salicylol, Hydrosalicylic acid†, Hydride of salicyl, Artificial oil of meadow-sweet. A nearly colourless, oily, inflammable liquid, discovered by Pagenstecher in the volatile oil of *Spiræa ulmaria* (meadow-sweet), which, when pure, entirely consists of it; and by Piria, as a product of the decomposition of salicin.

Prep. The oil of meadow-sweet is mixed with a strong solution of caustic potassa, and the yellow crystalline mass which separates on agitation is purified by pressure between folds of bibulous paper and recrystallisation from alcohol; the resulting crystals (salicylite of potassium) are then decomposed by the addition of dilute sulphuric acid, the floating oil separated from the water, and freed from moisture by careful distillation from chloride of calcium.

Prop., &c. Salicylous acid is soluble in ether and alcohol, and slightly so in water, to which it imparts its peculiar fragrance and the characteristic property of striking a deep violet colour with the sesquisalts of iron. It is distinguished from salicylic acid, which also exhibits this reaction, by its liquid form and odour.

SALI'VA. See MASTICATION.

SALM'ON. *Syn.* SALMO, L. The *Salmo Salar* (Linn.), a well-known, soft-finned abdominal fish. Its normal locality is at the mouth or estuary of the larger rivers of the northern seas, which, during the breeding season, it ascends, sooner or later, in the summer months, against all obstacles, for the purpose of depositing its spawn.

The salmon is an excellent and highly esteemed fish; but it is rich, oily, and difficult of digestion, and, therefore, ill adapted to the delicate or dyspeptic. When pickled, salted, or smoked, it is only fitted for persons of very strong stomachs, although in this state it is regarded as a great delicacy by epicures.

Salmon is preferably cooked by boiling. One weighing 10 lbs. will require to be gently simmered for about an hour, reckoning from the time the water commences boiling. For fish of other weights, from 6 to 7 minutes per lb. may be allowed. See FISH, &c.

SALOOP'. Sassafras (chips) tea, flavoured with milk and sugar. A wholesome and useful drink in cutaneous and rheumatic affections. See SALEP.

SALT. *Syn.* SAL, L.; SEL, Fr. Salts may be regarded as acids in which one or more atoms of hydrogen, a constant constituent of all true acids, are replaced by a metal or other basic radical. This relationship between acids and salts will be better understood by reference to the subjoined list of acids and their corresponding potassium and ammonium salts:

ACIDS.	SALTS.
HCl (Hydrochloric acid)	— KCl (Chloride of potassium.)
" " "	— NH_4Cl (Chloride of ammonium).
HNO_3 (Nitric acid)	— KNO_3 (Nitrate of potassium).
" " "	— NH_4NO_3 (Nitrate of ammonium).
H_2SO_4 (Sulphuric acid)	— K_2SO_4 (Sulphate of potassium.
" " "	— $(NH_4)_2SO_4$ (Sulphate of ammonium).

Acids are, in fact, hydrogen salts. The so-called DOUBLE SALTS are, according to one view, combinations of two salts of the same acid, but of different basic radicles; thus, common alum is a compound of sulphate of aluminum and sulphate of potassium.

The salts are a most important class of bodies, and their applications and uses in the arts of life and civilisation are almost infinite. See NOMENCLATURE, &c.

Salt, Bitter Pur'ging. Epsom salt.

Salt, Cathar'tic. Of GLAUBER, sulphate of sodium; ENGLISH or BITTER S., sulphate of magnesium (Epsom salt).

Salt, Common. *Syn.* CULINARY SALT. Chloride of sodium.

Salt, Diuret'ic. Acetate of potassium.

Salt, Ep'som. Sulphate of magnesium.

Salt, Feb'rifuge. Chloride of potassium.

Salt, Fu''sible. Phosphate of ammonium.

Salt, Glauber's. Sulphate of sodium.

Salt, Macqueer's. Binarseniate of potassium.

Salt, Microcos'mic. Phosphate of sodium and ammonium.

Salt, Red. Common salt wetted with an infusion of beet-root, or cochineal, or tincture of red sanders wood, then dried, and rubbed through a sieve. *Used* to impart a colour to gravies, &c. Infusion of saffron also gives a beautiful colour for this purpose. It has been proposed to colour Epsom salt in this way, to distinguish it from oxalic acid.

Salt, Rochelle. Tartrate of potassium and sodium.

Salt, Sea. Chloride of sodium.

Salt, Sed'ative. Boracic acid.

Salt, Smelling. See SALTS (*below*).

Salt, Sore-throat. Sal prunella.

Salt, Taste'less. Phosphate of sodium.

Salt, Veg'etable. Tartrate of potassium.

Salt, Vol'atile. Common carbonate of ammonium.

Salt of Lem'ons. *Syn.* SAL LIMONUM, L. Citric acid. That sold in the shops for the removal of ink spots from linen is binoxalate or quadroxalate of potassium, either alone or mixed with one half its weight of cream of tartar.

Salt of Sor'rel. Binoxalate or quadroxalate of potassium.

Salt of Steel. Sulphate of iron.

Salt of Tar'tar. Carbonate of potassium.

Salt of Vit'riol. Sulphate of zinc.

Salt of Wormwood. Carbonate of potassium.

SALTPE'TRE. Nitrate of potassium.

SALT'ING. PICKLING. *Syn.* This is an easy method of preserving butcher's meat, fish, and, indeed, most animal substances. It is performed in two ways:—

1. (DRY SALTING.) This, as practised in Hampshire, Yorkshire, and in various large establishments elsewhere, consists in merely well rubbing ordinary culinary salt, mixed with a little saltpetre, into the meat, until every crevice is thoroughly penetrated, and, afterwards, sprinkling some over it, and placing it on a board or in a trough, in such a manner that the brine may drain off. On the small scale, in private families, a mixture of salt, 2 lbs., with saltpetre, 1¼ or 2 oz., either with

or without about an oz. of good moist sugar, is commonly used for the purpose, and imparts a fine flavour to the meat. In both cases the pieces are turned every day, or every other day, until sufficiently cured, a little fresh salt being added as required. Sometimes the fresh meat is packed at once in casks, with the best coarse-grained or bay salt. This method is that commonly adopted for sea stores.

2. (WET SALTING, OR PICKLING IN BRINE.) When the meat is allowed to lie in the liquor that runs from it (see *above*), or is at once plunged into strong brine, it is said to be 'pickled,' or 'wet salted.' On the small scale, this is most conveniently performed by rubbing the fresh meat with salt, &c., as above, and, after it has lain a few hours, putting it into a pickle formed by dissolving about 4 lbs. of good salt and 2 oz. of saltpetre in 1 gall. of water, either with or without the addition of ½ to 1 lb. of moist sugar. This pickling liquor gets weaker by use, and should, therefore, be occasionally boiled down a little, and skimmed, at the same time adding some more of the dry ingredients. Three to ten days, depending on the size, is sufficiently long to keep meat in the brine. When it is taken out it should be hung up to dry, after which it may be packed in barrels with coarse-grained salt, or smoked, whichever may be desired. Saltpetre added to brine gives the meat a red colour, and brown sugar improves the flavour.

The sooner animal substances, more especially flesh, are salted after being killed, the better, as they then possess considerable absorbent power, which they gradually lose by age. See PUTREFACTION, SCURVY, SMOKING. &c.

SALTS (Smelling). *Syn.* SAL VOLATILIS OLEOSUS, L. Sesquicarbonate of ammonia commonly passes under the name of 'SMELLING SALTS,' and, with the addition of a few drops of essential oil, is frequently employed to fill 'SMELLING BOTTLES'; but when a strong and durable pungency is desired, the carbonate should alone be used, as in one or other of the following formulæ:—

1. Carbonate (not sesquicarbonate) of ammonia, 1 lb.; oil of lavender (Mitcham), 2 oz.; essence of bergamot, 1 oz.; oil of cloves, ¼ oz.; rub them together, and sublime; keep the product in well-stopped bottles.

2. Carbonate of ammonia, 1 lb.; oil of lavender, 2 oz.; oils of bergamot and lemon, of each, 1 oz.; as the last.

3. Carbonate of ammonia, ½ lb.; essence of bergamot, 1 oz.; oil of verbena, ¼ oz.; otto of roses, 1 dr.; as before.

4. Carbonate of ammonia, ¾ lb.; essences of bergamot and lemon, of each, ½ oz.; essence de petit grain, ¼ oz.; oil of cloves, 1 dr., as before.

5. (Extemporaneous.)—*a.* From sal ammoniac, 1 dr.; pure potassa, 3 drs.; grind them together, and add, of essence of lemons, 15 drops; oil of cloves, 3 or 4 drops.—*b.* From carbonate or sesquicarbonate of ammonia (bruised), q. s.; volatile ammoniacal essence, a few drops. (See page 465.)

According to Dr. Paris, GODFREY'S SMELLING SALTS are made by resubliming volatile salt with subcarbonate of potassa and a little spirits of wine (and essential oil).

SALVE. A name indiscriminately applied by the vulgar to any consistent, greasy preparation used in medicine.

Salve, Lip-. *Syn.* CERATUM LABIALE, L. *Prep.* 1. (RED or PERUVIAN.) From spermaceti ointment, ½ lb.; alkanet root, ½ oz.; melt them together until sufficiently coloured, strain, and, when the strained fat has cooled a little, add of balsam of Peru, 3 drs.; stir well, and in a few minutes pour off the clear portion from the dregs; lastly, stir in of oil of cloves, 20 or 30 drops. This never gets rancid.

2. (ROSE.) See CERATE.

3. (WHITE.) From the finest spermaceti ointment or cerate, 3 oz.; finely powdered white sugar, 1 oz.; neroli or essence de petit grain, 10 or 12 drops, or q. s.

Obs. Numerous formulæ are extant for lip-salves, as for other like articles, but the preceding are those generally employed in trade. The perfumes may be varied at will, and the salve named after them. A very small quantity of finely powdered borax is occasionally added. FRENCH LIP-SALVE is said to contain alum, in fine powder; and GERMAN LIP-SALVE is said to be made of cacao butter. See CERATE, POMMADE, and OINTMENT.

SAND. *Syn.* ARENA, L. River and sea sand consist chiefly of finely divided siliceous matter, mixed, occasionally, with carbonate of lime. That of Lynn and Alum Bay is nearly purely silica, and is, therefore, selected for the manufacture of glass. Sand is used by moulders in metal, and as a manure for heavy land. It is a large and necessary portion of every fertile soil.

SAN'DAL WOOD. 1. (RED SANDERS WOOD, R. SAUNDERS W.; LIGNUM SANTALI RUBRI, LIGNUM SANTALINUM RUBRUM, PTEROCARPUS —Ph. L. & E.) The wood of *Pterocarpus santalinus.* It is *used* in medicine as a colouring matter. It is also employed in dyeing, and to stain varnishes. WOOL may be dyed a carmine red by dipping it alternately into an infusion of this wood and an acidulous bath. (Trommsdorff.) Prepared with a mordant of alum and tartar, and then dyed in a bath of sandal wood and sumach, it takes a reddish-yellow. (Bancroft.) See SANTALIN.

2. (WHITE SANDAL WOOD, WHITE SANDERS; SANTALUM ALBUM.) The young timber, or, according to others, the outside wood of *Santalum album* (Linn.).

3. (YELLOW SANDAL WOOD; SANTALUM CITRINUM, S. FLAVUM.) The old timber, or, according to others, the heart of the same tree. Both the latter are much esteemed on

account of their fragrance, and yield a valuable essential oil.

SAN'DARACH. *Syn.* SANDRAC, GUM S. A resin obtained from *Thuja articulata,* and *Juniperus communis* (in warm climates). It is slightly fragrant, is freely soluble in rectified spirit, and has a sp. gr. of 1·05 to 1·09. It is *used* as incense, pounce, in varnishes, &c.

SAN'DERS WOOD. See SANDAL WOOD.

SAN'DIVER. *Syn.* GLASS GALL; FELL VITRI, SAL VITRI, L. The saline scum that swims on glass when first made. It is occasionally *used* in tooth-powders.

SANGUINA'RINE. *Syn.* SANGUINARINA, L. Obtained from the root of *Sanguinaria Canadensis* (Linn.), or blood-root, by digesting it in anhydrous alcohol; exhausting it with weak sulphuric acid; precipitating by liquor of ammonia; dissolving out by ether, and precipitating sulphate of sanguinarine by the addition of sulphuric acid. The sulphate may be decomposed by ammonia, which precipitates the alkaloid as a white pearly substance, of an acrid taste, very soluble in alcohol, also soluble in ether and volatile oils. With acids it forms soluble salts, remarkable for their beautiful red, crimson, and scarlet colours. These salts are *used* in medicine as expectorants, in doses of fractions of a grain.

The 'sanguinarin' of the American 'Eclectics' is prepared by precipitating a saturated tincture of blood-root by water. It contains an uncertain proportion of the alkaloid, and is of a deep reddish-brown colour. See RESINOIDS.

SAN'TALIN. The colouring principle of red sanders wood.

SAN'TONIN. $C_{15}H_{18}O_3$. *Syn.* SANTONIC ACID; SANTONINUM, L. The crystalline and characteristic principle of the seed of several varieties of *Artemisia.*

Prep. (Ph. Baden. 1841.) Take of wormseed, 4 parts; hydrate of lime, 1¼ part; mix, and exhaust them with alcohol of 90%; distil off 3-4ths of the spirit, and evaporate the remainder to one half, which, at the boiling temperature, is to be mixed with acetic acid in excess, and afterwards with water; on repose, impure santonine subsides; wash this with a little weak spirit, then dissolve it in rectified spirit, 10 parts, decolour by ebullition for a few minutes with animal charcoal, and filter; the filtrate deposits colourless crystals of santonine as it cools; these are to be dried, and kept in opaque bottles.

Prop., &c. Prismatic or tabular crystals; inodorous; tasteless, or only slightly bitter; fusible; volatilisable; soluble in 4500 parts of cold and about 250 parts of boiling water; soluble in cold alcohol and ether; freely soluble in hot alcohol. It is much esteemed as a tasteless worm medicine, and is especially adapted to remove lumbricales (large round worms).—*Dose.* 6 to 18 or 20 grs., repeated night and morning, followed by a brisk purge.

SAP GREEN. See GREEN PIGMENTS.

SAPONIFICA'TION. See SOAP.

SAP'ONIN. *Syn.* SAPONINUM, L. A white non-crystallisable substance, obtained by the action of hot diluted alcohol on the root of *Saponaria officinalis* (Linn.), or soap wort.

Prop., &c. Saponin is soluble in hot water, and the solution froths strongly on agitation. The smallest quantity of the powder causes violent sneezing.

SARCOCOL'LA. A gum-resin supposed to be derived from one or more plants of the natural order *Renæaceæ,* growing in Arabia and Persia. It somewhat resembles gum arabic, except in being soluble in both water and alcohol, and in having a bitter-sweet taste. It was formerly used in surgery.

SAR'COSINE. $C_3H_7O_2N$. A feebly basic substance, obtained by boiling kreatine for some time with a solution of pure baryta. It forms colourless, transparent plates, freely soluble in water, sparingly so in alcohol, and insoluble in ether; it may be fused and volatilised.

SARSAPARIL'LA. *Syn.* SARSÆ RADIX (B. P.), RADIX SARZÆ, RADIX SARSAPARILLÆ, SARZA (Ph. L. & E.), SARSAPARILLA (Ph. D. & U. S.), L. "Jamaica sarza. The root of *Smilax officinalis,* Kunth" (Ph. L.); "and probably of other species." (Ph. E.)

The sarsaparillas of commerce are divided by Dr. Pereira into two classes:—'Mealy sarsaparillas' and 'non-mealy sarsaparillas.' In the first are placed Brazilian or Lisbon, Caraccas or gouty Vera Cruz, and Honduras; the second includes Jamaica, Lima, and true Vera Cruz.

The mealy sarsaparillas are distinguished by "the mealy character of the inner cortical layers, which are white or pale-coloured. The meal or starch is sometimes so abundant, that a shower of it, in the form of white dust, falls when we fracture the roots." The medulla or pith is also frequently very amylaceous.

The non-mealy sarsaparillas "are characterised by a deeply coloured (red or brown), usually non-mealy, cortex. The cortex is red, and much thinner than in the mealy sorts." "If a drop of oil of vitriol be applied to a transverse section of the root of the non-mealy sarsaparillas, both cortex and wood acquire a dark-red or purplish tint;" whilst in the preceding varieties, the mealy coat, and, sometimes, the pith, is but little altered in colour. "The decoction of non-mealy sarsaparilla, when cold, is somewhat darkened, but does not yield a blue colour when a solution of iodine is added to it." The aqueous extract, when rubbed down with a little cold distilled water in a mortar, does not yield a turbid liquid, nor become blue on the addition of iodine. The reverse is the case with the decoction and extract of the mealy varieties.

The JAMAICA, RED JAMAICA, or RED-BEARDED SARSAPARILLA (SARZA JAMAICENSIS —Ph. D.), is the variety which should alone be used in medicine. This kind yields from

33 to 44% of its weight of extract (Battley, Hennell, Pope), and contains less starchy matter than the other varieties. It is distinguished by exhibiting the above peculiarities in a marked degree, by the dirty reddish colour of its bark, which "is not mealy," and by being "beset very plentifully with rootlets" (fibres).—Ph. L. Its powder has also a pale reddish-brown colour. The other varieties of sarsaparilla, viz. the Lisbon, Lima, Vera Cruz, and Honduras, are frequently substituted for the Jamaica by the druggists in the preparations of the decoctions and extracts of this drug; but the products are vastly inferior in quantity, colour, taste, and medicinal virtue, to those prepared from the officinal sarsaparilla. Decoction of sarsaparilla, when made with the Honduras root, is very liable to ferment, even by a few hours' exposure, in hot weather. We have seen hogsheads of the strong decoction, after exposure for a single night, in as active a state of fermentation as a gyle of beer, with a frothy head, and evolving a most disagreeable odour, that was not wholly removed by several hours' boiling. When this occurs the decoction suffers in density, and the product in extract is, consequently, considerably lessened. Yet this is frequently allowed to occur in the wholesale laboratory, where the rule should be—always begin a 'bath of sarza' (as it is called), and, indeed, of other perishable articles, early in the morning, and finish it, completely and entirely, the same day.

Sarsaparilla has been recommended as a mild but efficacious alterative, diaphoretic and tonic. It has long been a popular remedy in chronic rheumatism, rheumatic and gouty pains, scurvy, scrofula, syphilis, secondary syphilis, lepra, psoriasis, and several other skin diseases; and, especially, in cachexia, or a general bad habit of body, and to remove the symptoms arising from the injudicious use of mercurials, often falsely called 'secondary syphilis.' During its use the skin should be kept warm, and diluents should be freely taken. Its efficacy has been greatly exaggerated. It is, however, much more effective in warm than in northern climates.—*Dose.* In substance, ½ to 1 dr., three or four times daily; but, preferably, made into a decoction or infusion.

The articles so much puffed under the names of American or United States sarsaparilla and extract of sarsaparilla are "nothing more than the decoction of a common herb, a sort of 'aralia,' inhabiting the swamps and marshes of the United States. When cut up it has the appearance of chaff, but not the slightest resemblance in character, colour, or taste, to even the most inferior species of smilax (or sarza). The decoction is sweetened with a little sugar, flavoured with benzoin and sassafras, and, finally, preserved from decomposition, by means of the bichloride of mercury." "I have heard of several cases of deadly sickness, and other dangerous symptoms, following its use." "We do not believe that a particle of real sarsaparilla ever entered into the composition of either of the articles referred to." ('Med. Circ.,' ii, 227.) See DECOCTION and EXTRACT.

SARSAPARIL'LIN. *Syn.* PARIGLIN, PARILLIC ACID, SALSAPARIN, SMILACIN. A white, crystallisable, odourless, and nearly tasteless substance, discovered by Pallotta and Folchi, in sarsaparilla.

Prep. The bark of Jamaica sarsaparilla is treated with hot rectified spirit, and the resulting tincture reduced to about one third by distilling off the spirit; the residual liquid is then filtered, whilst boiling, slightly concentrated by evaporation, and set aside to crystallise; the crystalline deposit is redissolved in either hot rectified spirit or boiling water, and decoloured by agitation with a little animal charcoal; the filtrate deposits crystals of nearly pure smilacin as it cools. It may also be extracted by boiling water.

Prop., *&c.* A non-nitrogenised neutral body. Water holding a very small quantity of it in solution froths considerably on agitation. This is especially the case with infusion of Jamaica sarsaparilla, and this property has consequently been proposed as a test of the quality of sarsaparilla root. Its medicinal properties are similar to those of sarsaparilla. According to Pallotta, it is a powerful sedative, and diminishes the vital energies in proportion to the quantity taken.—*Dose.* 2 to 10 grs.; in the usual cases in which the root is given.

SAS'SAFRAS. *Syn.* SASSAFRAS RADIX (B. P.), SASSAFRAS RADIX, SASSAFRAS (Ph. L. E. & D.), L. "The root of *Sassafras officinale*, Nees. *Laurus sassafras*, Linn.)"—Ph. L. It has a fragrant odour, and a sweetish aromatic taste. It has long been reputed a stimulating alterative, diaphoretic, diuretic, and tonic; and an infusion of the chips (sassafras chips), under the name of sassafras tea, has been a popular 'diet drink' in various cutaneous affections, gout, chronic rheumatism, &c.

SATURA'TION. The state in which a body has taken its full dose, or chemical proportion, of any other substance with which it can combine, or which it can dissolve; as water with sugar or a salt, or an alkali with an acid, when the properties of both are neutralised.

SAUCERS (for Dyeing). *Prep.* 1. (BLUE.) From blue carmine, made into a paste with gum water, which is then spread over the inside of the saucers, and dried.

2. (PINK.)—*a.* From pure rouge mixed with a little carbonate of soda, then made into a paste with thin gum water, and applied as the last.

b. Well-washed safflower, 8 oz.; carbonate of soda, 2 oz.; water, 2 gallons; infuse, strain, add of French chalk (scraped fine with Dutch rushes), 2 lbs.; mix well, and precipitate the colour by adding a solution of tartaric acid; collect the red powder, drain it, add a very small quantity of gum, and apply the paste to the saucers. Inferior. Both the above are used to tinge silk stockings, gloves, &c.

SAUCE. A liquid or semi-liquid condiment or seasoning for food. The following receipts for sauces may be useful to the reader:—

Sauce, Ancho'vy. 1. (Extemporaneous.) From 3 or 4 anchovies, chopped small; butter, 3 oz.; water, a wine-glassful; vinegar, 2 table-spoonfuls; flour, 1 do.; stir the mixture over the fire till it thickens, then rub it through a coarse hair sleeve.

2. (Wholesale.) As essence of anchovies. Other fish sauces may be made in the same manner.

Sauce, Apple. From sharp apples, cored, sliced, stewed with a spoonful or two of water, and then beaten to a perfectly smooth pulp with a little good moist sugar. Tomato, and many other like sauces, may be made in the same manner.

Sauce, Aristocratique. From green-walnut juice and anchovies, equal parts; cloves, mace, and pimento, of each, bruised, 1 dr. to every lb. of juice; boil and strain, and then add to every pint, 1 pint of vinegar, ½ pint of port wine, ¼ pint of soy, and a few shallots; let the whole stand for a few day, and decant the clear liquor.

Bech'amel. A species of fine white broth or consommée, thickened with cream, and used as 'white sauce.'

Sauce, Caper. Put twelve table-spoonfuls of melted butter into a stewpan, place it on the fire, and, when on the point of boiling, add 1 oz. of fresh butter and 1 table-spoonful of capers; shake the stewpan round over the fire until the butter is melted, add a little pepper and salt, and serve where directed. Also as mint sauce.

Sauce, Chut'ney. 1. From sour apples (pared and cored), tomatoes, brown sugar, and sultana raisins, of each, 8 oz.; common salt, 4 oz.; red chillies and powdered ginger, of each, 2 oz.; garlic and shallots, of each, 1 oz.; pound the whole well, add, of strong vinegar, 3 quarts; lemon juice, 1 do.; and digest, with frequent agitation, for a month; then pour off nearly all the liquor, and bottle it. *Used* for fish or meat, either hot or cold, or to flavour stews, &c. The residue is the 'Chutney,' 'Chetney,' or 'Chitni,' which must be ground to a smooth paste with a stone and muller, and then put into pots or jars. It is used like mustard.

2. (BENGAL CHITNI.) As the last, but using tamarinds instead of apples, and only sufficient vinegar and lemon juice to form a paste.

Cor'atch. From good mushroom ketchup, ½ gal.; walnut ketchup, ¾ pint; India soy and chillie vinegar, of each, ½ pint; essence of anchovies, 5 or 6 oz.; macerate for a fortnight.

Sauce, Epicurienne. To the last add of walnut ketchup and port wine, of each, 1 quart; garlic and white pepper, of each (bruised), 4 oz.; chillies (bruised), 1 oz.; mace and cloves, of each, ½ oz.

Sauce, Fich. From port wine, 1 gal.; mountain do., 1 quart; walnut ketchup, 2 quarts; anchovies (with the liquor), 2 lbs.; 8 lemons; 48 shallots; scraped horseradish, 1½ lb.; flour of mustard, 8 oz.; mace, 1 oz.; cayenne, q. s.; boil the whole up gently, strain, and bottle.

Ketchup. See page 668.

Sauce, Kitchener's. *Syn.* KITCHENER'S RELISH. From salt, 3 oz.; black pepper, 2 oz.; allspice, horseradish, and shallots, of each, 1 oz.; burnt-sugar colouring, a wine-glassful; mushroom ketchup, 1 quart; (all bruised or scraped;) macerate for 3 weeks, strain, and bottle.

Lem'on Pickle. From lemon juice and vinegar, of each, 3 galls.; bruised ginger, 1 lb.; allspice, pepper, and grated lemon peel, of each, 8 oz.; salt, 3½ lbs.; cayenne, 2 oz.; mace and nutmegs, of each, 1 oz.; digest for 14 days.

Sauce, Lobs'ter. From lobsters, as ANCHOVY SAUCE.

Sauce, Mint. From garden mint, chopped small, and then beaten up with vinegar, some moist sugar, and a little salt and pepper.

Sauce, On'ion. From onions boiled to a pulp and then beaten up with melted butter and a little warm milk.

Sauce, Oys'ter. From about 12 oysters, and 6 or 7 oz. of melted butter, with a little cayenne pepper, and 2 or 3 spoonfuls of cream, stirred together over a slow fire, then brought to a boil, and served.

Sauce Piquante. From soy and cayenne pepper, of each 4 oz.; port wine, ½ pint; brown pickling vinegar, 1½ pint; mix, and let them stand for 7 or 8 days before bottling.

Sauce, Quin's. From walnut pickle and port wine, of each, 1 pint; mushroom ketchup, 1 quart; anchovies and shallots (chopped fine), of each, 2 dozen; soy, ½ pint; cayenne, ¼ oz.; simmer gently for 10 minutes, and in a fortnight strain, and bottle.

Sauce au Roi. From brown vinegar (good), 3 quarts; soy and walnut ketchup, of each, ½ pint; cloves and shallots, of each, 1 doz.; cayenne pepper, 1½ oz.; mix, and digest for 14 days.

Sauce, Shrimp. From shrimps or prawns, as ANCHOVY SAUCE.

Soy. See that article.

Sauce, Superlative. From port wine and mushroom ketchup, of each, 1 quart; walnut pickle, 1 pint; soy, ½ pint; pounded anchovies, ½ lb.; fresh lemon peel, minced shallots, and scraped horseradish, of each, 2 oz.; allspice and black pepper (bruised), of each, 1 oz.; cayenne pepper and bruised celery seed, of each, ¼ oz. (or currie powder, ¾ oz.); digest for 14 days, strain, and bottle. Very relishing.

Sauce, Toma'to. From bruised tomatoes, 1 gal.; good salt, ½ lb.; mix, in 3 days press out the juice, to each quart of which add of shallots, 2 oz.; black pepper, 1 dr.; simmer very gently for 20 to 30 minutes, strain, and add to the strained liquor, mace, allspice, ginger, nutmegs, and cochineal, of each, ¼ oz.; coriander seed, 1 dr.; simmer gently for 10 minutes, strain, cool, and in a week put it into bottles.

Sauce, Waterloo. From strong vinegar (nearly boiling), 1 quart; port wine, ¾ pint; mushroom-ketchup, ½ pint; walnut ketchup, ¼ pint; essence of anchovies, 4 oz.; 8 cloves of garlic; cochineal (powdered), ½ oz. (or red beet, sliced, 3 oz.); let them stand together for a fortnight or longer, occasionally shaking the bottle.

Sauce, White. *Syn.* BUTTER SAUCE, MELTED BUTTER. From good butter, 4 oz.; cream, 2½ oz.; salt (in very fine powder), ½ teaspoonful; put them into a pot or basin, set this in hot water, and beat the whole with a bone, wooden, or silver spoon, until it forms a perfectly smooth cream-like mixture, avoiding too much heat, which would make it run oily. A table-spoonful of sherry, marsala, lemon juice, or vinegar, is sometimes added; but the selection must depend on the dishes the sauce is intended for. Used either by itself, or as a basis for other sauces. Beaten up with any of the 'bottled sauces,' an excellent compound sauce of the added ingredient is immediately obtained.

SAUER KRAUT. [Ger.] *Prep.* Clean white cabbages, cut them into small pieces, and stratify them in a cask along with culinary salt and a few juniper berries and caraway seeds, observing to pack them down as hard as possible, without crushing them, and to cover them with a lid pressed down with a heavy weight. The cask should be placed in a cold situation as soon as a sour smell is perceived. Used by the Germans and other northern nations of Europe like our 'pickled cabbage,' but more extensively.

SAU'SAGES. From the fat and lean of pork (PORK SAUSAGES), or of beef (BEEF SAUSAGES), chopped small, flavoured with spice, and put into gut skins, or pressed into pots or balls (SAUSAGE MEAT). Crum of bread is also added. Their quality is proportionate to that of the ingredients, and to the care and cleanliness employed in preparing them.

SAV'ELOYS. Pork sausages made in such a way that they keep good for a considerable time *Prep.* (Mrs. Rundell.) Take of young pork, free from bone and skin. 3 lbs.; salt it with 1 oz. of saltpetre, and ½ lb. of common salt, for 2 days; then chop it fine, add, 3 teaspoonfuls of pepper, 1 doz. sage leaves, chopped fine, and 1 lb. of grated bread; mix well, fill the skins, and steam them or bake them half an hour in a slack oven. They are said to be good either hot or cold.

SAV'INE. *Syn.* SAVIN; FOLIA SABINÆ, SABINA (Ph. L. E. & D.). L. "The recent and dried tops of *Juniperis Sabina*, Linn.," or common savine. (Ph. L.) It is a powerful stimulant, diaphoretic, emmenagogue, and anthelmintic; and, externally, rubefacient, escharotic, and vesicant. In large doses it is apt to occasion abortion, and acts as a poison. SAVINE POWDER mixed with verdigris is often applied to corns and warts. It is now chiefly used in the form of ointment. *Dose.* 5 to 15 grs., twice or thrice daily (with care), in amenorrhœa and worms. See CERATE.

SAVONETTES. [Fr.] *Syn.* WASH BALLS. These are made of any of the mild toilet soaps, scented at will, generally with the addition of some powdered starch or farina, and sometimes sand. The spherical or spheroidal form is given to them by pressure in moulds, or by first roughly forming them with the hands, and, when quite hard, turning them in a lathe. According to Mr. Beasley, "they are formed into spherical balls by taking a mass of the prepared soap in the left hand, and a conical drinking-glass with rather thin edges in the right. By turning the glass and ball of soap in every direction, the rounded form is soon given; when dry, the surface is scraped, to render it more smooth and even."

Prep. 1. Take of curd soap, 3 lbs.; finest yellow soap, 2 lbs.; (both in shavings;) soft water, ¾ pint; melt by a gentle heat, stir in of powdered starch (farina), 1½ lb.; when the mass has considerably cooled, further add of essence of lemon or bergamot, 1 oz., and make it into balls.

2. (CAMPHOR.) Melt spermaceti, 2 oz.; add camphor (cut small), 1 oz.; dissolve, and add the liquid mass to white curd soap, 1½ lb., previously melted by the aid of a little water and a gentle heat, and allowed to cool considerably, as above. These should be covered with tin-foil.

3. (HONEY.) From the finest bright coloured yellow soap, 7 lbs.; palm oil ¼ lb.; melt, and add of oil of verbena, rose-geraneum, or ginger-grass, 1 oz.; as No. 1. Sometimes ½ oz. of oil of rosemary is also added.

4. (MOTTLED.)—*a.* RED. Cut white curd or Windsor soap (not too dry) into small square pieces, and roll these in a mixture of powdered bole or rouge, either with or without the addition of some starch; then squeeze them strongly into balls, observing to mix the colour as little as possible.—*b.* BLUE. Roll the pieces in powder blue, and proceed as before.—*c.* GREEN. Roll the pieces in a mixture of powder blue and bright yellow ochre. By varying the colour of the powder, mottled savonettes of any colour may be produced.

5. (SAND.) From soap (at will), 2 lbs.; fine siliceous sand, 1 lb.; scent, q. s.; as No. 1. For the finer qualities, finely powdered pumice-stone is substituted for sand.

6. (VIOLET.) From palm-oil soap, 4 lbs.; farina, 2 lbs.; finely powdered orris root, 1 lb. Sometimes a little smalts, or indigo, is added.

SCAB'IES. See ITCH.

SCAGLIO'LA. A species of plaster or stucco, made of pure gypsum, with variegated colours, in imitation of marble. In general, the liquid employed is a weak solution of Flanders glue; and the colours, any which are not decomposed or destroyed by admixture with sulphate of lime and exposure to the light. The composition is often applied upon hollow columns formed of wood, or even of laths nailed together, and the surface, when hard, is turned smooth in a lathe, and polished.

SCALD-HEAD. See Ringworm.

SCALDS. See Burns and Scalds.

SCALL. *Syn.* Scald. The popular name of several skin diseases distinguished by scabs or scurfiness, whether dry or humid. See Eruptions, Ringworm, &c.

SCAM'MONY. *Syn.* Scammonium (B. P., Ph. L. E. & D.), L. The "gum resin emitted from the cut root of *Convolvulus Scammonia*, Linn." (Ph. L.), or Aleppo scammony-plant.

There are three principal varieties or qualities of scammony known in the market; viz. —VIRGIN (sp. gr. 1·21), SECONDS (sp. gr. 1·460 to 1·463), and THIRDS (sp. gr. 1·465 to 1·500). The best, and that only intended to be used in medicine, is imported from Aleppo.

Pur. Scammony is not only largely adulterated in the country of its production, but again after its arrival in England. SMYRNA SCAMMONY, a very inferior variety, is also commonly dressed up, and sold as Aleppo scammony. In many cases substances are sold at the public sales in London, and elsewhere, as scammony, which contain only a mere trace of that article. This is all ground up to form the scammony-powder of the shops. *Vide* 'Evid. Com. Ho. Com.,' 1855.) PURE SCAMMONY has a peculiar cheesy smell, and a greenish-gray colour. It is "porous and brittle, and the freshly broken surface shines; hydrochloric acid being dropped on it, it emits no bubbles; nor does the powder digested in water, at a heat of 170° Fahr., become blue by the simultaneous addition of iodide of potassium and dilute nitric acid. Out of 100 grs., 78 (80—Ph. E.) should be soluble in ether." (Ph. L.) The tincture of pure scammony is not turned green by nitric acid. If the powder effervesce with dilute acids, it contains chalk.

Uses, &c. Pure scammony is a powerful drastic purgative and anthelmintic, inadmissible in inflammatory conditions of the alimentary canal, but well adapted for torpid and inactive conditions of the abdominal organs. Associated with calomel, rhubarb, or sulphate of potassa, it is useful in all cases in which an active cathartic or vermifuge may be required, especially for children. *Dose.* (For an adult) 5 to 15 grs., in powder, or made into a bolus or emulsion.

SCARLATI'NA. See Scarlet Fever.

SCAR'LET DYE. *Proc.* (Poërner.)—*a.* The 'Bouillon.' Take of cream of tartar, 1¾ oz.; water, q. s.; boil in a block-tin vessel, and when dissolved, add of solution of tin (made by dissolving 2 oz. of grain tin in a mixture of 1 lb. each of nitric acid and water, and 1¼ oz. of sal ammoniac), 1¾ oz.; boil for 3 minutes, then introduce the cloth, boil for 2 hours, drain it, and let it cool.—*b.* The 'Rougie.' Next, take of cream of tartar, ¼ oz.; water, q. s.; boil, and add powdered cochineal, 1 oz.; again boil for 5 minutes, then gradually add of solution of tin, 1 oz., stirring well all the time; lastly, put in the goods and dye as quickly as possible. The quantities given are those for 1 to 1¼ lb. of woollen cloth. The result is a full scarlet. To make the colour turn on the 'ponceau' or poppy, a little turmeric is added to the bath.

Obs. Scarlet is red with a tinge of yellow; it is nearly always produced by cochineal. See Red Dye.

SCARLET FE'VER. *Syn.* Scarlatina, Febris scarlatina, L. A highly contagious disease, so named after the peculiar eruption or efflorescence of the skin which accompanies it. The milder form of this disease (SCARLATINA SIMPLEX, S. MITIS) comes on with languor, chilliness alternated by fits of heat, nausea, vomiting (frequently), and other common symptoms of fever; followed, on the third or fourth day, by a scarlet efflorescence upon the skin, which, after three or four days, ends in the cuticle or scarf-skin peeling off in branny scales. Dropsical swelling of the whole body sometimes follows the disappearance of the eruption; but this, with the febrile symptoms, and the soreness of the throat (if any), then give way, and the patient gradually regains his former health and strength. In the *malignant form* of scarlet fever (SCARLATINA CYNANCHICA, S. ANGINOSA, S. MALIGNA) the febrile symptoms, from the first, are more alarming; there is bilious vomiting, great soreness and ulceration of the throat, the pulse is small and quick, and the breathing laborious. These symptoms rapidly increase on the appearance of the eruption; the body then becomes swollen, the nose and eyes inflamed, the breath fetid, the throat suppurates, putrid symptoms ensue, and the patient is either suddenly cut off or recovers very slowly.

The early symptoms of scarlet fever are distinguished from those of the MEASLES and SMALLPOX by the greater extent and want of elevation of the eruption, and by its not congregating into patches. Nor are there the cough and running from the eyes and nose which usher in the measles.

The treatment of the milder form of scarlet fever, especially that of childhood, may consist of the administration of an emetic, followed by a saline aperient, to clear the bowels; the latter being repeated as occasion may require. The patient should be kept in a cool and well-ventilated room, the diet should be light and farinaceous, and the use of diluent drinks copiously indulged in. If the febrile symptoms are severe, or the throat much affected, small doses of some mild mercurial, as calomel, mercurial pill, or quicksilver with chalk, may be administered, either separately or combined with antimonial diaphoretics or

Dover's powder. In malignant scarlet fever a smart emetic should be given early, and mercurials and diaphoretics at once freely exhibited. Acidulated gargles may be used for the throat, and, when the heat of the body is much above the natural standard, sponging the whole body with cold water, or with vinegar-and-water, may be had recourse to. If the malignant symptoms run high, and assume a typhoid or putrid character, the system must be supported with stimulant tonics, as, wine, bark, capsicum, &c.

According to Hahnemann, Koreff, and Randhahn, belladonna is a prophylactic against scarlet fever. The homœopathists also hold it to be almost a specific in the disease.

Scarlet fever is common to all ages of life, but children and young persons are the most subject to it. Unlike the smallpox, it occasionally attacks the same person more than once. It is most common in dirty, close, damp situations.

SCENE'-PAINTING. A variety of distemper painting employed in theatres, &c., governed by perspective, and having for its object the production of striking effects when viewed at a distance. Water, size, turpentine, and the ordinary pigments, are the materials used for the purpose.

SCENT BAGS. See Sachets.

SCENT BALLS. *Syn.* Pastilles de toilette odorantes, Fr. These are prepared from any of the materials noticed under pot pourri, scented powders, and sachets, made into a paste with mucilage of gum tragacanth, and moulded into any desired forms, as that of balls, beads, medallions, &c. The larger ones are frequently polished.

SCENTED CAS'SOLETTES. See Pot Pourri, and *above*.

SCENTS (Pommade). *Prep.* 1. (Cowslip.) From essence of bergamot, 8 oz.; essence of lemon, 4 oz.; oil of cloves, 2 oz.; essence de petit grain, 1 oz.

2. (Jonquille.) From essence of bergamot and lemon, of each, 8 oz.; oils of orange peel and cloves, of each, 2 oz.; oil of sassafras, 1 oz.; liquid storax, ½ oz.; digest, with warmth and agitation, for a few hours, and decant the clear portion in a week.

3. (Millefleur.) From essence of ambergris (finest), 4 oz.; essence of lemon, 3 oz.; oil of cloves and English oil of lavender, of each, 2 oz.; essence de petit grain, essence of bergamot, and balsam of Peru (genuine), of each, 1 oz.; as the last.

Obs. The above are employed to scent pomatums, hair oils, &c. 1 oz. of any one of them, dissolved in 1 pint of the strongest rectified spirit, produces a delicious perfume for the handkerchief.

SCENTS (Snuff). *Prep.* 1. Essence of bergamot, 2 oz.; otto of roses and neroli, of each, 1 dr.

2. Oil of lavender, 1 oz.; essence of lemon, 2 oz.; essence of bergamot, 4 oz.

3. To the last, add of oil of cloves, 2 oz.

4. Essence of musk and ambergris, of each, 1 oz.; liquor of ammonia, ½ dr. See Snuff, &c.

SCHEELE'S GREEN. See Green Pigments.

SCHLIPPE'S SALT. Sulphantimoniate of sodium.

SCHWARTZ'S DROPS. See Worm Drops.

SCIAT'ICA. See Rheumatism.

SCIL'LITIN. *Syn.* Scillitina, Scillitite. A whitish, resinous, translucent, bitter, deliquescent substance, obtained by Vögel from squills. It is soluble in water, alcohol, and acetic acid, and is purgative, acrid, and poisonous.

SCORBU'TUS. See Scurvy.

SCO''RIA. Dross; the refuse or useless part of any substance, more especially that left from bodies which have been subjected to the action of fire. It is frequently used in the plural (scoriæ).

SCOTT'S DROPS. See Patent Medicines.

SCOUR'ING. The common method of cleaning cloth is by beating and brushing it, unless it be very dirty, when it undergoes the operation of scouring. This is best done on the small scale, as with articles of wearing apparel, as follows:—A little curd soap is dissolved in water, and, after mixing it with a little clarified ox-gall, is applied to all the spots of grease, dirt, &c., and well rubbed into them with a stiff brush until they appear to be removed; after which the article is well cleaned all over with a brush or sponge dipped into some warm water, to which the previous mixture and a little more ox-gall has been added. The cloth is next thoroughly rinsed in clean water, and hung up to dry. For dark-coloured cloths, some fuller's earth is often added to the mixture of soap and gall. When the article is nearly dry, the nap is laid smooth, and it is carefully pressed (if with a hot iron, on the wrong side), after which a soft brush, moistened with a drop or two of olive oil, is frequently passed over it, to give it a finish and gloss.

Cloth is also cleaned in the dry way:—The spots being removed, as above, and the wetted parts having become dry, clean damp sand is strewed over it, and beaten into it with a brush, after which the article is well gone over with a hard brush, when the sand comes out, and brings the dirt with it.

Buff and drab cloth is generally cleaned by covering it with a paste made with pipe-clay and water, either with or without a little umber to temper the colour, which, when dry, is rubbed and brushed off.

When the article requires renovation as well as scouring, it is placed, whilst still damp, on a board, and the threadbare parts are rubbed with a half-worn hatter's card filled with flocks, or with a teasel, or a prickly thistle, until a nap is raised; it is next hung up to dry, after which it is 'finished off' as before. When the cloth is much faded, it is usual to give it a 'dip,' as it is called, or to pass it through a dye bath to freshen up the colour. Black and dark blue cloth, if rusty or faded, is commonly treated to a coat of 'reviver,' instead of being 're-dipped,' and is then hung up until next day, before being pressed and finished off. See Spots and Stains.

SCOURING DROPS. See Drops.

SCUDAMORE'S LO'TION. See Gout Lotion.

SCURF. *Syn.* Furfura. Scurf "is a natural and healthy formation, and though it may be kept from accumulating, it cannot be prevented. It is produced on every part of the body where hair is found, although, from the more active growth of hair on the scalp, the facilities for collecting, and the contrast of colour, it strikes the eye most disagreeably in that situation. This will show how futile any attempt must be which shall have for its object to prevent the formation of the scurf. It may be removed, and should be removed, every day, with the hair-brush; but prevention is impossible, inasmuch as it is opposed to a law of nature. Occasionally, as a morbid action, an unusual quantity of scurf is produced, in which case medical means may be adopted to bring the scalp into a more healthful state." (Eras. Wilson.) In such cases the daily use of some mild stimulating or detergent wash, with due attention to the stomach and bowels, will generally abate this annoyance.

SCUR'VY. *Syn.* Scorbutus, L. This disease commences with indolence, sallow looks, debility, and loss of spirits; the gums become sore and spongy, the teeth loose, and the breath fetid; the legs swell, eruptions appear on different parts of the body, and, at length, the patient sinks under general emaciation, diarrhœa, and hæmorrhages.

The treatment of ordinary cases of this disease mainly consists in employing a diet of fresh animal and green vegetable food, with mild ale, beer, or lemonade, as beverages; scrupulously avoiding salted and dried meat. The fresh-squeezed juice of lemons is, perhaps, of all other substances, the most powerful remedy in this disease in its early stages, and is useful in all of them. Effervescing draughts formed with the bicarbonate of potassa (not soda) are also excellent.

SEAL'ING WAX. See Wax.

SEA SICKNESS. The most effectual preventive of sea sickness appears to be the horizontal position. When there is much pain, after the stomach has been well cleared, a few drops of laudanum may be taken, or an opium plaster may be applied over the region of the stomach. Persons about to proceed to sea should put their stomach and bowels in proper order, by the use of mild aperients, and even an emetic, if required, when it will generally be found that a glass of warm and weak brandy-and-water, to which 15 or 20 drops of laudanum, or, still better, 1 or 2 drops of creasote, have been added, will effectually prevent any disposition to sea sickness, provided the bowels be attended to, and excess in eating and drinking be at the same time avoided. A spoonful of crushed ice, in a wine-glassful of cold water, or weak brandy-and-water, will often afford relief when all other means fail. Smoking at sea is very apt to induce sickness. M. F. Curie, in the '*Comptes Rendus*,' asserts that drawing in the breath as the vessel descends, and exhaling it as it ascends, on the billows, by preventing the movements of the diaphragm acting abnormally on the phrenetic nerves, prevent sea sickness. On this Mr. Atkinson, at one of the meetings of the British Association, observed that—if a person, seated on board ship, holding a tumbler filled with water in his hand, makes an effort to prevent the water running over, at the same time allowing not merely his arm, but also his whole body, to participate in the movements, he will find that this has the effect of preventing the giddiness and nausea that the rolling and tossing of the vessel have a tendency to produce in inexperienced voyagers. If the person is suffering from sickness at the commencement of his experiment, as soon as he grasps the glass of liquid in his hand, and suffers his arm to take its course and go through the movements alluded to, he feels as if he were performing them of his own free will, and the nausea abates immediately, and very soon ceases entirely, and does not return so long as he suffers his arm and body to assume the postures into which they seem to be drawn. Should he, however, resist the free course of his hand, he instantly feels a thrill of pain, of a peculiarly stunning kind, shoot through his head, and experiences a sense of dizziness and returning nausea.

SED'ATIVES. *Syn.* Sedativa, L. Medicines and agents which diminish the force of the circulation or the animal energy, and allay pain. Foxglove, henbane, tobacco, potassio-tartrate of antimony, and several of the neutral salts and acids, act as sedatives. Cold is, perhaps, the most powerful agent of this class.

SEED. *Syn.* Semen, L. The seeds of plants are conspicuous for their vast number and variety, and their extreme usefulness to man. The seeds of certain of the *Graminaceæ* furnish him with his daily bread; some of those of the *Leguminosæ*, in either the immature or ripe state, supply his table with wholesome esculents, or provide a nourishing diet for his domestic animals; whilst those of numerous other plants, dispersed through every class, order, and family, yield their treasures of oil, medicinals, or perfumes, for his use.

SELEN'IC ACID. H_2SeO_4. *Syn.* Acidum selenicum, L. *Prep.* By fusing selenium with nitrate of potassium or of sodium, acting on the fused mass with water, precipitating the resulting solution with acetate or nitrate of lead, and decomposing the precipitate (selenate of lead), diffused in water, with sulphuretted hydrogen. The selenic acid, thus obtained, may be cautiously concentrated in a glass vessel, if necessary; but if this be pushed too far, it is resolved into selenious acid (H_2SeO_3) and oxygen.

Prop., *&c.* Hydrated selenic acid is a colourless liquid, closely resembling sulphuric acid; its salts (selenates) bear the closest analogy to the sulphates.

SELE'NIUM. Se. A rare chemical element, discovered by Berzelius in 1818.

SEM'OLA (Bullock's). This preparation consists of wheaten flour deprived of much of its starch by washings with water, and contains the largest amount (48 per cent.) of nitrogenous or albumenoid principles consistent with its adaptability to culinary purposes. It is specially intended as a food for infants, weakly children, and invalids.

SEMOLI'NA. *Syn.* Sémoule, Semoulina. The large hard grains of wheat flour retained in the bolting machine, after the fine flour has passed through its meshes. "The best sémoule is obtained from the wheat of the southern parts of Europe. With the sémoule, the fine white Parisian bread called '*gruau*' is baked." (Ure.)

SEN'EGA. *Syn.* Seneka, Snake root, Rattlesnake r.; Senegæ radix (B. P.); Senega (Ph. L. E. & D.), Radix senegæ, L. "The root of *Polygala Senega*, Linn." (Ph. L.) A stimulating diaphoretic, and expectorant; in large doses, diuretic, cathartic, and emetic. In America it is used as an antidote to the bite of the rattlesnake. Drs. Chapman and Hartshorne extol it as an emmenagogue. Dr. Pereira says that it is an exceedingly valuable remedy in the latter stages of bronchial or pulmonary inflammation, when this disease occurs in aged, debilitated, or torpid constitutions.—*Dose.* 10 to 30 grs., in powder or decoction (combined with aromatics, opium, or camphor), thrice daily.

SEN'EGIN. *Syn.* Polygalin, Polygalic acid. A white odourless powder, discovered by Gehlin in the bark of seneka root (*Polygala Senega*).

SEN'NA. *Syn.* Senna, Sennæ folia, L. There are three principal varieties:—

1. Alexandrian senna (senna Alexandrina—B. P., Ph. L. E. & D.), referred in the Ph. L. to *Cassia officinalis* and *Cassia obovata*, in the Ph. D. to *Cassia acutifolia* (Delile), and in the Ph. E. to various species of cassia. The leaves are "unequal at the base, ovate acute, or obovate mucronate." (Ph. L.) It is generally mixed with the leaves of *Solenostemma Argel* (argel leaves), the presence of which is often the occasion of much griping. The leaf of argel is fully an inch long, warty, regular, in its formation, and the lateral nerves are imperfectly seen on the under side; whilst that of the true Alexandrian senna never exceeds ¾ inch in length, is oblique, and the nerves on the under side are very conspicuous.

2. Indian senna (senna Indica—B. P., Ph. L. & E.) is referred to *Cassia officinalis* in the Ph. L., and in the Ph. E. & D. to *Cassia elongata* (Lemaire, Lisancourt). The leaf is "unequal at the base," and "lanceolate." (Ph. L.)

3. Tinnevelly senna, forming the finest Indian, now introduced into the Ph. D., is therein described as composed of the leaflets of *Cassia oblongata*. These are pale green, thin, flexible, and from 1 to 2 inches long, and nearly ½ inch broad. This variety is equal in medicinal virtue to the best Alexandrian, and is to be preferred, on account of its being imported perfectly free from adulteration.

Senna is purgative in doses of 10 to 30 grs., either in powder or made into an infusion of tea with water, combined with ginger, caraways, or some other aromatic, to prevent griping. It acts chiefly on the small intestines, and generally effects its purpose within 4 hours after being taken.

SE''PIA. A pigment prepared from the 'ink' or black fluid secreted by *Sepia officinalis* (Linn.), and several other varieties of cuttle-fish. The contents of the 'ink bags' are inspissated as soon as possible after collection, and then form the crude sepia of commerce. This is prepared for artists by boiling it for a short time in a weak lye of caustic alkali, precipitating the solution with an acid, and well washing and carefully drying the precipitate by a gentle heat. It possesses a fine brown colour, and is used like Indian ink.

SER'PENTARY. *Syn.* Virginian snake root; Serpentaria radix (B. P.), Serpentariæ radix, Serpentaria (Ph. L. & E.), Aristolochia serpentaria (Ph. D.), L. An excellent stimulating diaphoretic and tonic; in typhoid and putrid fevers, dyspepsia, &c. It is admirably suited to check vomiting and to tranquillise the stomach, particularly in bilious cases. (Dr. Chapman.)—*Dose.* 10 to 20 grs., every third or fourth hour, its use being preceded by an aperient.

SE''RUM. *Syn.* Seralbumen. The clear pale fluid in which the blood-globules float, and which separates from blood during its coagulation. It is, essentially, a feebly alkaline solution of albumen. See Albumen.

SESQUI-. See Nomenclature.

SE'TON. *Syn.* Setaceum. An artificial ulcer, made by passing a portion of silk or thread under the skin by means of a seton needle, a part of which is drawn through daily, and thus keeps up a constant irritation. Occasionally, the thread is anointed with some irritating substance, for the purpose of increasing the discharge.

SE'VUM (Prepared). *Syn.* Sevum præparatum (B. P.), Sevum magneticum, L. *Prep.* 1. ('Pharm. Journ.') Mould candles, at least 2 years old, melted by a very gentle heat, and strained from the wicks.

2. As MAGNETIC ADEPS. *Used* to make mercurial ointment. Triturated with 8, 12, or 16 times its weight of quicksilver, the globules are completely extinguished in from 10 to 15 minutes.

SHAD'DOCK. A large species of orange, the fruit of *Citrus Decumana* (Linn.).

SHAGREEN'. This is prepared from the skins of the horse, wild ass, and camel, as follows:—The skin, freed from epidermis and hair by soaking in water, and, after dressing with the currier's fleshing-knife, is sprinkled over, whilst still wet and stretched, with the seeds of a species of chenopodium, which are imbedded in it by strong pressure, and in this state it is dried; the seeds are then shaken off, and the surface rubbed or shaved down, nearly to the bottom of the seed-pits or indentations; it is next soaked in water, by which the skin swells, and the recently depressed surface rises into a number of minute prominences; it is, lastly, dyed and smoothed off. Black is given to it with galls and copperas; blue, with a solution of indigo; green, with copper filings and sal ammoniac; and red, with cochineal and alum. Shagreen was formerly very extensively used for covering the cases of watches, spectacles, surgical instruments, &c.

SHALLOT'. *Syn.* ESCHALOT. The *Allium ascalonicum* (Linn.), a plant allied to the onion, the bulb of which is much used as a sauce or pot-herb.

SHAMPOO'ING. A practice common in the East, having for its object the increase or restoration of the tone and vigour of the body, or the mitigation of pain. It is applied either in the bath or immediately after quitting it, generally the latter, and consists in pressing and kneading the flesh, stretching and relaxing the knee-joints, and laboriously brushing and scrubbing the skin.

SHARPS. See FLOUR.

SHA'VING. The following are Mr. Mechi's instructions for this, to many persons, troublesome operation:—Never fail to well wash your beard with soap and cold water, and to rub it dry, immediately before you apply the lather, of which the more you use the easier you will shave. Never use warm water, which makes a tender face. Place the razor (closed, of course) in your pocket, or under your arm, to warm it. The moment you leave your bed is the best time to shave. Always put your shaving-brush away with the lather on it.

The razor (being only a very fine saw) should be moved in a sloping or sawing direction, holding it nearly flat to your face, care being taken to draw the skin as tight as possible with the left hand, so as to present an even surface and throw out the beard. The practice of pressing on the edge of a razor in stropping generally rounds it; the pressure should be directed to the back, which must never be raised from the strop. If you shave from heel to point of the razor, strop it from point to heel; but if you begin with the point, then strop from heel to point. If you only once put away your razor without stropping or otherwise cleaning the edge, you must no longer expect to shave well, the soap and damp so soon rust the fine teeth or edge. A piece of plate leather should always be kept with the razors.

SHAVING FLUID. See ESSENCE OF SOAP.

SHEEP. *Syn.* OVIS, L. The *Ovis aries*, an animal domesticated almost everywhere. Its flesh supplies us with food; its skin, with leather; its fleece, with wool; and its intestines, with catgut. Its fat (sevum) is officinal. See MUTTON, SUET, &c.

SHELL-FISH. The common name for the Crustacean and Molluscous animals that are used for food. 'Shell-fish' are extremely liable to disturb the functions of the stomach and bowels. The oyster (*Ostrea edulis*), and the cockle (*Cardium edule*), are, perhaps, the least objectionable. The crab (*Cancer pagurus*, the crayfish (*Astacus fluvialis*), the lobster (*Homarus vulgaris*), the mussel (*Mytilus edulis*), the prawn (*Palæmon serratus*), the periwinkle (*Littorina littorea*), and the shrimp (*Crangon vulgaris*), with the exception of the claws of the first three, are always suspicious, particularly in hot weather, and often absolutely poisonous. We have seen the most alarming, nay, fatal symptoms, follow the use of mussels, even amongst those habitually accustomed to take them; whilst it is a well-known fact that the luscious body of the crab and lobster have too often formed the last supper of the epicure. See OYSTERS, &c.

SHELL-LAC. See LAC.

SHELLS (Prepared). *Syn.* TESTÆ PRÆPARATÆ (Ph. L. 1836), L. *Prep.* (Ph. L. 1836.) Wash oyster-shells (OSTREÆ—Ph.L.) with boiling water, having previously freed them from extraneous matters; then prepare them in the manner directed for chalk. The product is similar in constitution and properties to prepared chalk.

SHER'BET. [Pers.] A cooling drink, used in the East, prepared with the juices of fruit, and water, variously sweetened and flavoured. The word has been, of late years, commonly employed in these countries in a similar manner. See LEMONADE, ORANGEADE, and POWDERS.

SHER'RY. *Syn.* SHERRY WINE, SHERRIS; VINUM XERICUM (Ph. L.), VINUM ALBUM (Ph. E.), VINUM ALBUM HISPANICUM (Ph. D.), L. This is the only wine ordered in the British Pharmacopœias. See WINES.

SHERRY-COBBLER. *Prep.* (Redwood.) Half fill a tumbler with clean pounded ice; add a table-spoonful of powdered white sugar, a few thin slices of lemon with the peel (or some strawberries or other similar fruit, bruised), and a wine-glassful or more of sherry wine; mix them together (lightly), and, as the ice melts, suck the liquor through a straw (or a small tube of silver or glass).

Obs. A favourite American drink; very refreshing in hot weather.

SHIN″GLES. *Syn.* ZOSTER, HERPES ZOSTER, HERPES ZONA, L. A local variety of herpes or tetter, remarkable for forming a kind of belt round or partly round some part of the trunk of the body, chiefly the waist or abdomen. See TETTERS.

SHOT METAL. *Prep.* From lead, 1000 parts; arsenic, 3 parts. When the lead is coarse, 6 to 8 parts of metallic arsenic are required to fit it for this purpose.

SHOW BOTTLES. The large ornamental carboys and jars filled with coloured liquids, and displayed in the shop-windows of druggists, may be noticed under this head. They are striking objects when the solutions they contain are bright and of a deep pure tint, especially at night, when they are seen by transmitted light. The following formulæ for the solutions have been recommended by different persons:—

AMBER. From dragon's blood (in coarse powder, 1 part; oil of vitrol, 4 parts; digest, and, when the solution is complete, dilute the mixture with distilled or soft water, q. s.

BLUE.—*a.* From blue vitriol, 2 oz.; oil of vitriol, ½ oz.; water, 1 pint.—*b.* A solution of indigo in sulphuric acid, diluted with water, q. s.—*c.* A solution of soluble Prussian blue in either oxalic or hydrochloric acid, slightly diluted, and afterwards further diluted with water to the proper shade of colour.

CRIMSON.—*a.* From alkanet root, 1 oz.; oil of turpentine, 1 pint. *Used* chiefly for the bull's-eyes of lamps.—*b.* As PINK (*b*), *below.*

GREEN.—*a.* From sulphate of copper, 2 oz.; bichromate of potash, 1 dr., or q. s.; water, 1 pint.—*b.* A solution of sulphate of copper, 2 oz.; chloride of sodium, 4 oz.; water, 1 pint, or q. s.—*c.* A solution of distilled verdigris in acetic acid, diluted with water, q. s.—*d.* Dissolve blue vitriol in water, and add nitric acid until it turns green.

LILAC.—*a.* Dissolve crude oxide of cobalt (zaffre) in nitric or hydrochloric acid, add sesquicarbonate of ammonia, in excess, and afterwards, sufficient ammonio-sulphate of copper to strike the colour.—*b.* As the purple, but more diluted.

MAGENTA. Acetate of rosaniline, dissolved in water, q. s.

OLIVE. Dissolve sulphate of iron and oil of vitriol, equal weights, in water, and add of nitrate of copper, q. s. to strike the colour.

ORANGE.—*a.* A solution of bichromate of potash in water, either with or without the addition of some hydrochloric or sulphuric acid.—*b.* Dissolve gamboge or annotta in liquor of potassa; dilute with water, and add a little spirit.

PINK.—*a.* To a solution of chloride or nitrate of cobalt, in water, add sesquicarbonate of ammonia, q. s. to dissolve the precipitate at first formed.—*b.* From madder (washed with cold water), 1 oz.; sesquicarbonate of ammonia, 4 oz.; water, 3 pints; digest, with agitation, for 24 hours, then dilute with more water, and filter.

PURPLE.—*a.* A solution of sulphate of copper, 1 oz., in water, 1 quart, or q. s., with the addition of sesquicarbonate of ammonia, 1¼ oz.—*b.* To the last, add a sufficient quantity of the first pink (above) to turn the colour.—*c.* To an infusion of logwood, add carbonate of ammonia or of potassa, q. s.—*d.* Sugar of lead, 3 oz.; powdered cochineal, 1 dr.; water, q. s.—*e.* Add sulphate of indigo, nearly neutralised with chalk, to an infusion of cochineal, till it turns purple.

RED.—*a.* Dissolve carmine in liquor of ammonia, and dilute with water.—*b.* Digest powdered cochineal in a weak solution of ammonia or of sal ammoniac, and afterwards dilute with water.—*c.* Add oil of vitriol, 4 oz., to water, 1 gall., and digest dried red rose leaves, 8 oz., in the mixture for 24 hours.—*d.* Dissolve madder lake in a solution of sesquicarbonate of ammonia, and dilute the solution with water.

VIOLET. To a solution of nitrate of cobalt in a solution of sesquicarbonate of ammonia, add solution of ammonia-sulphate of copper, q. s. to strike the colour.

YELLOW.—*a.* A solution of susquioxide or rust of iron, ½ lb., in hydrochloric acid, 1 quart, diluted with water.—*b.* To a strong decoction of French berries add a little alum.—*c.* A simple solution of chromate or bichromate of potash in distilled water.—*d.* A solution of equal parts of nitre and either chromate or bichromate of potash, in water.

Obs. Most of the above require filtering, which should be done through powdered glass, placed in a glass funnel, and never through paper. They usually need a second filtration, after being exposed to the light for some weeks; hence it is convenient always to make a little more of them than is required to fill the bottle, as several of them, when diluted after filtration, become again turbid. Distilled water or filtered rain water should be used.

SHRIMP. See SHELL-FISH.

SHRUB. A species of concentrated cold punch, prepared with lemon juice, spirit, sugar, and water. When the word is used in its unqualified form, RUM SHRUB is alluded to.

Shrub, Brandy. *Prep.* 1. Take of brandy, 1 gall.; orange and lemon juice, of each, 1 pint; peels of 2 oranges; do. of 1 lemon; digest for 24 hours, strain, and add of white sugar, 4 lbs., dissolved in water, 5 pints; in a fortnight decant the clear liquid for use.

2. As RUM SHRUB (below), but using brandy.

Shrub, Lemon. *Syn.* LEMONADE SHRUB. Concentrated lemonade, either with or without the addition of a little spirit. *Used* to make lemonade or lemon sherbet.

Shrub, Punch. Concentrated punch, made with equal parts of spirit and water. *Used* to make punch.

Shrub, Rum. *Prep.* 1. As BRANDY SHRUB, but substituting rum for brandy.

2. Take of rum, at proof, 34 gall. (or, if of any other strength, an equivalent quantity); essential oils of orange and lemon, of each, 2 oz., dissolved in rectified spirit, 1 quart; good lump sugar, 300 lbs., dissolved in water, 20 galls.; mix well by 'rummaging,' and gradually and cautiously add of Seville orange juice, or of a solution of tartaric acid in water, q. s. to produce a pleasant but scarcely perceptible acidity; next 'rummage' well for 15 minutes, then add sufficient water to make the whole measure exactly 100 galls., and again 'rummage' well for at least half an hour; lastly, bung the cask down loosely, and allow it to repose for some days. In a fortnight, or less, it will usually be sufficient 'brilliant' to be racked. The *product* is 100 galls., at 66 u. p.

Obs. Rum shrub is the kind in the greatest demand, and that having a slight preponderance of the orange flavour is the most esteemed. If wholly flavoured with lemon, it is apt to acquire a kind of 'dead' or 'musty' flavour by long keeping. The substitution of a few gallons of brandy for a portion of the rum, or the addition, after racking, of about 1 oz. each of bruised bitter almonds, cloves, and cassia, the peels of about 2 dozen oranges, and a 'thread' of the essences of ambergris and vanilla, render it delicious.

SIAL'OGOGUES. Medicines which increase the flow of saliva. Mercurials and pellitory of Spain belong to this class.

SICK'NESS. Nausea and vomiting frequently arise from the use of improper food, and other articles which offend the stomach; at other times, it is symptomatic of some disease, as colic, cholera, dyspepsia, head affections, incipient fever, &c.; in which case the primary affection should be attended to. Nausea lowers the pulse, contracts the small vessels, occasions cold perspiration, severe rigors, and trembling; and diminishes, as long as it lasts, the actions, and even the general powers, of life. The act of retching, and vomiting more especially, on the contrary, rouses rather than depresses, puts to flight all the preceding symptoms, and often restores the system to itself.

The best remedies or palliatives in these affections are effervescing saline draughts, either with or without the addition of a few drops of tincture of henbane or tincture of opium. A glass of genuine lemonade, iced, or a spoonful of crushed ice in a wine-glassful of mint water, is also very serviceable. Pepsin (Bullock and Reynolds) and oxalate of cerium are said to be most valuable remedies in the sickness of pregnancy. See Draughts, Pregnancy, Sea Sickness, &c.

SIFT'ING is to pulverulent substances what filtration is to liquids; but in this case the medium through which the substance passes is, usually, of a simpler and coarser description. Sieves are commonly employed for the purpose, which are fitted with silk or brass-wire gauze for fine purposes, and horse-hair, cloth, or wire netting, for coarser ones. Drum sieves are such as are furnished with covers and an enclosed space to receive the fine powder that passes through, by which dust and loss are prevented.

SIGHT. See Vision.

SIG'NATURES (Fac-similes of). These may be readily obtained as follows:—

1. Let the name be written on a piece of paper, and, while the ink is still wet, sprinkle over it some finely powdered gum arabic, then make a rim round it, and pour on it some fusible alloy in a liquid state. Impressions may be taken from the plates formed in this way, by means of printing ink and the copper-plate press.

2. By the use of transfer ink and lithography.

SIL'ICA. SiO_2. *Syn.* Silicic anhydride, Silicic acid, Silex, Siliceous earth†, Earth of flints†. This exists in quartz and rock crystal in a nearly pure state. The sands of rivers and the sea-shore, flint, and almost all the scintillating stones, chiefly consist of it. It may be obtained in a state of absolute purity by passing gaseous fluoride of silicon into water, collecting the resulting gelatinous precipitate on a calico filter, washing it with distilled water, drying it, and heating it to redness. Another method is to precipitate a solution of silicate of soda or potassa (soluble glass) with dilute hydrochloric acid, and to treat the precipitate as before.

Prop., &c. A fine, white, tasteless, infusible powder, insoluble in all acids, after being heated, except the hydrofluoric; soluble in strong alkaline solutions; its salts are called silicates. Sp. gr. 2·66. See Glass, Soluble Glass, &c.

SIL'ICON. Si. *Syn.* Silicium. An elementary substance forming the base of silica.

SILK. As an article of clothing, as far as "roundness of fibre, softness of texture, absence of attraction for moisture, and power of communicating warmth, are concerned, silk is greatly superior to both linen and cotton; moreover it gives the sensation of freshness to the touch which is so agreeable in linen. But, with all these advantages, silk (when worn next the body) has its defects; on the slightest friction, it disturbs the electricity of the skin, and thus becomes a source of irritation. Sometimes, it is true, this irritation is advantageous, as causing a determination of blood to the surface; but when this action is not required, it is disagreeable, and quite equal, in a sensitive constitution, to producing an eruption on the skin. I have seen eruptions occasioned in this manner, and, when they have not occurred, so much itching and irritation as to call for the abandonment of the garment." (Eras. Wilson.)

Silk is characterised by its fibres appearing perfectly smooth and cylindrical, without depressions, even under a magnifying power of 160. Its fibres (even when dyed) acquire a permanent straw-yellow colour when steeped in nitric acid of the sp. gr. 1·20 to 1·30. The fibres of white or light coloured silk are similarly stained by a solution of picric acid. A thread of silk, when inflamed, shrivels and burns with difficulty, evolves a peculiar odour, and leaves a bulky charcoal. By these properties silk is distinguished from cotton and linen.

The cleaning and renovation of articles of wearing apparel made of silk are matters requiring some care. No silk goods look well after being washed, however carefully it may be done; and this method should therefore never be resorted to but from absolute necessity. It is recommended to sponge faded silks with warm water and curd soap, then to rub them with a dry cloth on a flat board, and afterwards to iron them on the wrong side with an ordinary smoothing iron. Sponging with spirit, benzol, or pure oil of turpentine, also greatly improves old silk, and is often preferable to any other method. The odour of the benzol passes off very quickly, that of the turpentine after exposure for a few days. When the ironing is done on the right side, thin paper should be spread over the surface, to prevent 'glazing.' See Dyeing, Gilding, &c.

SILK'WORM GUT. See Gut.

SIL'LABUB. *Prep.* Grate off the yellow peel of a lemon with lump sugar, and dissolve the sugar in ¾ pint of wine; add the juice of ½ a lemon, and a ¼ pint of cream; beat the whole together until of a proper thickness, and then put it into glasses.

Obs. ¾ to 1 pint of new milk is often substituted for the cream, and strong cider or perry for the wine. Grated nutmeg is often added. When 'whipped' to a froth, it is called 'whipped sillabub.' See Cream (Whipped).

SILVER. Ag. *Syn.* Argentum, L. This metal, like gold, appears to have been as much valued in the remotest ages of antiquity of which we have any record, as at the present time. It is found in nature both in the metallic state and mineralised, in the state of alloy, and combined with sulphur, chlorine, and other metallic sulphurets. In Great Britain it is found in combination chiefly with lead. It is extracted from its ores principally by the process of amalgamation, founded on its easy solubility in mercury, and by subsequent cupellation. It is only prepared on the large scale.

Chemically pure silver may be obtained by the methods noticed subsequently.

Prop. Pure silver has a very white colour, a high degree of lustre, is exceedingly malleable and ductile, and is the best conductor of heat and electricity known. Its hardness is between that of copper and gold; its sp. gr. is 10·475 to 10·500; it melts at about 1873° Fahr., or bright redness (Daniell); is freely soluble in nitric acid, and dissolves in sulphuric acid by the aid of heat; it refuses to oxidise alone at any temperature, but, when strongly heated in open vessels, it absorbs many times its bulk of oxygen, which is again disengaged at the moment of solidification; its surface is rapidly tarnished by sulphuretted hydrogen and by the fumes of sulphur.

Pur. "Entirely soluble in diluted nitric acid. This solution, treated with an excess of muriate of soda, gives a white precipitate entirely soluble in ammonia water, and a fluid which is not affected by sulphuretted hydrogen." (Ph. E.)

Tests. 1. The compounds of silver, mixed with carbonate of soda, and exposed on a charcoal support to the inner flame of the blowpipe, afford white, brilliant, and ductile metallic globules, without any incrustation of the charcoal.—2. The salts of silver are non-volatile and colourless, but most of them acquire more or less a black tint by exposure to full daylight.

The soluble salts of silver give—1. A white curdy precipitate (chloride of silver) with hydrochloric acid and the soluble metallic chlorides, which is soluble in ammonia and insoluble in nitric acid, and blackened by exposure to light; 2. White precipitates with solutions of the alkaline carbonates, oxalates, and ferrocyanides;—3. Yellow precipitates with the alkaline arsenites and phosphates;—4. With the arseniates, red precipitates;—5. With the fixed alkalies, brown precipitates;—6. With sulphuretted hydrogen and hydrosulphuret of ammonia, a black powder, which is insoluble in dilute acids, alkalies, alkaline sulphurets, and cyanide of potassium, but readily soluble, with separation of sulphur, in boiling nitric acid; and—7. With phosphorus, and with metallic copper or zinc, pure silver.

Assay. 1. The method of assaying silver by cupellation has been explained under Assay and Cupellation; and that method is alone applicable when the alloy contains a very small quantity of silver, as a few ounces only per ton. When the reverse is the case, as with the silver of commerce, the following is a much more accurate method:—

2. *Humid assay of silver.*—*a.* Dissolve 10 grs. of the silver for assay in 100 grs. of nitric acid, sp. gr. 1·28, by the aid of heat, the solution being made in a tall stoppered glass tube, furnished with a foot; then place it in a very delicate balance, bring it into an exact state of equilibrium, and add the test solution (see *below*), gradually and cautiously, until the whole of the silver be thrown down; the number of grains now required to restore the equilibrium of the balance or scales gives the exact quantity of pure silver in 1000 parts of the sample.—*Obs.* To ensure accuracy, after each addition the stopper should be placed in the tube, and the latter violently agitated for a short time, when the liquor will rapidly clear and enable us to see when the operation

is concluded. We must then, as a check, add a small quantity of a solution of nitrate of silver to the liquor in the tube, after having first carefully taken the weight. If too much of the test liquor has been added, this will produce a fresh precipitate, and the assay cannot then be depended on.—Instead of weighing the quantity of test liquor used, a tube graduated into 100 parts, and holding 1000 grs., may be employed, every division of which required to throw down the silver, will represent the $\frac{1}{10}$th of a grain. See ALKALIMETRY and ACIDIMETRY.

b. The precipitate of chloride of silver may be collected in a paper filter, and be dried, washed, fused, and weighed. The previous weight of the paper, deducted from the gross weight of the filter and its contents, gives the quantity of chloride of silver present, which, multiplied by 0·75278, gives the weight of the pure silver in the sample.

Test liquor. Dissolve 54·27 (54¼) grs. of pure sea salt in 9945·73 grs. (or 22 oz. and 320¾ grs. avoirdupois) of distilled water; filter, and keep the liquor in a stoppered bottle for use. Pure sea salt is obtained by boiling together, for a few minutes, in a glass vessel, a solution of common salt with a little pure bicarbonate of soda; then adding to the filtered liquor sufficient hydrochloric acid to render it neutral to litmus and turmeric paper, and, lastly, evaporating and crystallising.

Obs. The presence of mercury, lead, or sulphuret of silver, interferes with the accuracy of the above assay. When mercury is present, the precipitate blackens less readily by exposure to light; and when it contains $\frac{4}{1000}$ or $\frac{5}{1000}$ of chloride of mercury, it remains of a dead white; with $\frac{3}{1000}$ it is not sensibly discoloured by the diffused light of a room, with $\frac{2}{1000}$ only slightly darkened, with $\frac{1}{1000}$ more so, but with pure chloride of silver, the effect is very rapid and intense. When this metal is present, which is, however, seldom the case, the assay sample must be placed in a small crucible, and exposed to a full red heat, before solution in the acid. Another method, proposed by M. Levol, and modified by M. Gay-Lussac, is to add to the nitric solution of the silver sufficient acetate of ammonia or crystallised acetate of soda to saturate all the nitric acid existing in the liquor, either in the free state or combined with the silver. When the alloy contains lead, shown by the precipitated chloride being partly soluble in water, it may either be laminated and subjected to the action of acetic acid before solution in the nitric acid; or, the test solution of chloride of soda should be replaced by one of chloride of lead; (139·355 grs. of the latter are equiv. to 58·732 grs. of the former). The presence of sulphuret of silver is detected whilst dissolving the sample in nitric acid, by the black flakes which may be observed floating about in the liquor in an insoluble state. These flakes may be dissolved by fuming nitric acid, or by adding pure concentrated sulphuric acid to the solution, which should be then heated for about a ¼ hour in a steam-bath. When thus treated, the precipitate produced by the test liquor represents the whole of the silver contained in the alloy.

Uses, &c. Metallic silver, unless in a state of very minute division, has no action on the human body. A plate of silver is ordered, in the Ph. L., as a test of the presence of nitric acid in the acetic and phosphoric acids; and metallic silver (preferably granulated) is employed by the other colleges in the preparation of the nitrate. Its numerous applications in the arts are well known. The standard silver of England contains 111 parts of silver, and 9 parts of copper.

Concluding remarks. The researches of Tillet, D'Arcet, and Gay-Lussac, have clearly shown that the percentage of silver in an alloy, as indicated by cupellation, is always below its real richness in that metal, owing to loss in the process; and, that the cupelled button always retains a trace of lead and copper, the precise quantity of which is variable. The following Table exhibits the additions to be made on this score, when the quantity assayed (assay pound) is 20 grs.:—

Weight after cupellation.	Actual richness in *pure silver.*	Percentage of richness in *pure silver.*
19·979	20	100
18·95	19	95
17·92	18	90
16·917	17	85
15·914	16	80
14·91	15	75
13·905	14	70
12·905	13	65
11·906	12	60
10·906	11	55
9·906	10	50
7·921	8	40
5·948	6	30
3·949	4	20
1·982	2	10

In assaying lead ores very poor in silver, the best quantity to be taken for cupellation is 500 grs.; and from that quantity 0·0148 of silver, including compensation for loss, represents one ounce of silver to the ton. A cupel may absorb its own weight of lead. If the quantity of lead to be absorbed is more considerable, another cupel may be turned topsy-turvy, and the cupel in which the assay is to be made may be placed upon it. See ASSAY, and M. Gay-Lussac's elaborate memoir on the "*Humid Assay of Silver.*"

For the recovery or reduction of silver from the chloride and its other compounds, several methods are employed:—

a. The washed chloride is placed in a zinc or iron cup, along with a little water strongly acidulated with sulphuric acid; or in a glass or porcelain cup along with a zinc plate; the whole may then be left to itself for some hours; or, to hasten the reduction, gently heated, or even boiled; the precipitated silver is washed with pure water, and dried.

b. (Hornung.) Digest the chloride with some ammonia and pure copper filings, for 24 hours, then wash and dry the powder.

c. (M. Levol.) The washed chloride is mixed with an equal weight of sugar, and the mixture is digested in an excess of a moderately strong solution of caustic potassa, with occasional agitation for 24 hours; or the whole is boiled for some time; the reduced silver is washed with distilled water.

d. (Mohr.) The dry chloride is mixed with 1-3rd of its weight of powdered black resin, and moderately heated in a crucible until the flame ceases to have a greenish-blue colour; the heat is then suddenly increased so as to melt the metal into a button or ingot.

e. (M. Gay-Lussac.) If the chloride, dry it, and throw it, in successive portions, into twice its weight of carbonate of potassa fused in a red-hot Hessian crucible; effervescence ensues, and the pure silver subsides to the bottom.—If a "soluble salt," as the nitrate, acidulate the solution, and precipitate it by means of a polished plate of copper; the silver is then obtained in the form of powder. The products of the above processes, when the latter are carefully conducted, are chemically pure silver.

Silver, Acetate of. *Syn.* ARGENTI ACETAS, L. *Prep.* By adding a solution of acetate of potassa to a like solution of nitrate of silver, washing the precipitate with cold water, redissolving it in a little hot water, and setting the solution aside to crystallise. Small colourless needles.

Silver, Ammoniuret of. See FULMINATING SILVER (Berthollet's, Nos. 1 and 2, *page* 547).

Silver, Ammonio-chloride of. *Syn.* ARGENTO-CHLORIDE OF AMMONIA; ARGENTI AMMONIO-CHLORIDUM, L. *Prep.* Add, gradually, chloride of silver (recently precipitated and well washed) to concentrated liquor of ammonia, as long as it is dissolved on agitation, applying a gentle heat towards the end; then heat the solution to the boiling-point, concentrate a little, and allow it to cool very slowly; collect the crystals which form, dry them by pressure (with care) between folds of bibulous paper, and at once preserve them from the light and air.—*Dose.* $\frac{1}{16}$ to $\frac{1}{8}$ gr.

Silver, Ben'zoate of. $AgC_7H_5O_2$. Thin transparent plates, which are blackened by exposure to the light. See BENZOATE.

Silver, Bro'mide of. AgBr. Resembles the chloride.

Silver, Car'bonate of. Ag_2CO_3. *Syn.* ARGENTI CARBONAS, L. A white insoluble powder, obtained by precipitating a cold solution of nitrate of silver with another of carbonate of sodium. It is decomposed by heat.

Silver, Chlo''ride of. AgCl. *Syn.* ARGENTIC CHLORIDE. *Prep.* Precipitate a solution of nitrate of silver by dilute hydrochloric acid or a solution of common salt; wash the precipitate, and dry it in the shade.—*Dose.* $\frac{1}{4}$ to 3 grs., thrice daily; in epilepsy, chronic dysentery, cholera, diarrhœa, &c. Dr. Perry regards it as preferable to the nitrate. When fused, chloride of silver forms horn silver, the 'luna cornea' of the older writers.

Silver, Cy'anide of. AgCN. *Syn.* ARGENTIC CYANIDE, HYDROCYANATE OF SILVER. *Prep.* Add dilute hydrocyanic acid to a solution of nitrate of silver, as long as a precipitate falls; wash this with distilled water, and dry it.

Prop., &c. Cyanide of silver is a white powder, soluble in ammonia, and decomposed by contact with vegetable substances; light turns it violet-coloured.—*Dose.* $\frac{1}{12}$ to $\frac{1}{6}$ gr.; in syphilis, &c. It has been proposed as a source of hydrocyanic acid. (Everitt.)

Silver Hyposul'phite of. $Ag_2S_2O_3$. *Syn.* ARGENTI HYPOSULPHIS, L. A white substance, insoluble in water, and very prone to decomposition. It is very soluble in the alkaline hyposulphites, forming compounds possessing an intensely sweet taste. See HYPOSULPHUROUS ACID.

Silver, I'odide of. AgI. *Syn.* ARGENTIC IODIDE; ARGENTI IODIDUM, L. *Prep.* Precipitate a solution of nitrate of silver with another of iodide of potassium; wash the precipitate with distilled water, and dry it in the shade. Pale greenish-yellow; insoluble in water and in liquor of ammonia; soluble in a solution of hyposulphite of soda. *Used* in some of the French hospitals in the stomach affections of scrofulous subjects; also in epilepsy.—*Dose.* $\frac{1}{12}$ to 1 gr.

Silver, Ni'trate of. $AgNO_3$. *Syn.* ARGENTI NITRAS, L. This article is found in commerce under two forms:—

1. CRYSTALLISED. *Prep.* By dissolving grain silver in nitric acid diluted with about twice its weight of water, evaporating the solution until it is strong enough to crystallise on cooling, and then allowing it to cool very slowly. Colourless; transparent, anhydrous rhombic prisms or tables; soluble in an equal weight of cold and in half their weight of boiling water; soluble in alcohol; fuse when heated, and at a higher temperature suffer decomposition; blackened by light, and by contact with organic substances. Its solution in distilled water is not sensibly darkened by light, in the absence of organic matter. *Used* for solutions, and in photography.

2. FUSED (LUNAR CAUSTIC; ARGENTI NITRAS—B. P., Ph. L. & E., A. N. FUSUM—Ph. D.). *Prep.* (Ph. D.) Refined silver, 3 oz.; pure nitric acid, 2 fl. oz.; distilled water, 5 fl. oz.; mix in a glass flask, and apply a gentle heat until the metal is dissolved; transfer the solution to a porcelain capsule (or a large porcelain

crucible), decanting it off a heavy black powder which appears at the bottom of the flask, and, having evaporated it to dryness, raise the heat (in a dark room) until the mass liquefies; then pour it into a brass mould (iron moulds—Ph. E. & Ph. L. 1836), furnished with cylindrical cavities of the size of a goose-quill, and which then admits of being opened by a hinge; preserve the concreted salt in well-stopped bottles, impervious to the light. The formulæ of the Ph. E. & Ph. L. 1836 are similar.

Obs. In preparing this salt, care should be had that the silver is free from copper. Pure nitrate of silver may, however, be prepared from silver containing copper, by evaporating the nitric solution to dryness, and cautiously heating the mixed nitrates to fusion. A small portion of the melted mass is examined from time to time, until a little dissolved in water, and treated with ammonia in excess, ceases to strike a blue colour. When this point is arrived at, the fused nitrate is allowed to cool, when it is redissolved in water, filtered or decanted from the insoluble black oxide of copper, and evaporated in the usual way.

The heat employed in preparing the fused nitrate should not exceed 420° Fahr., and the fusion should be effected completely, but with moderate expedition, to prevent loss of nitric acid. Formerly, a mass of well-tempered white clay, perforated by means of a well-greased goose-quill, was used instead of metal moulds. In the Ph. E. & Ph. L. 1836 the moulds are ordered to be greased; when this is done, the sticks of caustic should be wiped clean before rolling them in paper. The moulds should be gently heated before pouring the fused nitrate into them. Mr. Benzon, the celebrated Danish pharmaceutist, recommends mould formed of the massive white Bohemian talc or of English slate.

Pur., &c. Pure nitrate of silver, whether crystallised or fused, is entirely soluble in water, yielding a colourless solution, from which metallic silver is precipitated by a piece of bright copper; both are originally white, but are darkened by exposure to light and contact with organic matter.

Uses, &c. Nitrate of silver is a powerful tonic, antispasmodic, astringent, and escharotic.—*Dose.* ⅛ to 1 gr., gradually increased, twice or thrice a day, made into a pill with crum of bread; in chorea, epilepsy, &c., preceded by purgatives. It has been highly extolled by Mr. Ross, as a remedy in cholera. Its continued use permanently colours the skin. It is also extensively employed externally as a caustic. It is powerfully poisonous. A solution of common salt, emetics, and demulcents, constitute the treatment in such cases. Nitrate of silver is much employed in the manufacture of 'indelible ink' for linen, and hair dyes.

Silver, Di'oxide of. Ag_2O_2. *Syn.* ARGENTI SUBOXYDUM, L. *Prep.* From dry citrate of silver heated to 212° Fahr., in a stream of hydrogen gas, until it turns dark brown, when it is dissolved in water; the solution is next treated with potassa, and the precipitate is carefully washed and dried. A black powder, easily decomposed, and soluble in ammonia.

Silver, Oxide of. Ag_2O. *Syn.* PROTOXIDE OF SILVER; ARGENTI OXYDUM, A. PROTOXYDUM, L. *Prep.* 1. (Lane.) Nitrate of silver, 2 parts; hydrate of potassa, 1 part; dissolve each separately in distilled water, mix the solutions, and, after frequent agitation during an hour, collect and wash the precipitate, and dry it by a gentle heat in the shade. A pale brown powder.

2. Recently precipitated chloride of silver is boiled in a solution of hydrate of potassium of the sp. gr. 1·25, with frequent stirring and trituration, until, on testing a little of it, it is found to be entirely soluble in dilute nitric acid, when it is washed and dried, as before. A black and very dense powder. Chemically pure.

3. Nitrate of silver, ½ oz.; water, 4 fl. oz.; dissolve, and pour the solution into a bottle containing lime water, 2 quarts, or q. s.; agitate the mixture well, collect and wash the sediment, and dry it at a heat not exceeding 212° Fahr. A dark olive-brown powder. Pure.

Prop., &c. Very soluble in solutions of ammonia and of the alkaline hyposulphites; slightly soluble in water; reaction, alkaline; decomposed by light.—*Dose.* ½ to 2 grs.; in epilepsy, gastralgic irritations, &c. It is much used in France, and has been highly extolled in menorrhagia. By some, however, it is not considered superior to the nitrate.

Silver, Perox'ide of. *Syn.* ARGENTI PEROXYDUM, L. A black crystalline substance which forms on the positive electrode of a voltaic arrangement employed to decompose solution of nitrate of silver.

Silver, Sul'phate of. Ag_2SO_4. *Syn.* ARGENTI SULPHAS, L. *Prep.* By boiling silver in sulphuric acid; or, by precipitating a solution of the nitrate by another of sulphate of sodium. It dissolves in 80 parts of hot water, and falls in small colourless needles as the solution cools.

Silver, Sul'phide of. Ag_2S. *Syn.* SULPHURET OF SILVER; ARGENTI SULPHURETUM, L. Prepared by passing sulphuretted hydrogen through a solution of nitrate of silver; or, by melting its constituents together. It possesses a grayish-black colour, and is a strong sulphur-base.

Silver, Ox'idised. The high appreciation in which ornamental articles in oxidised silver are now held, renders a notice of the process followed interesting. There are two distinct shades in use, one produced by chlorine, which has a brownish tint, and the other by sulphur, which has a bluish-black tint. To produce the former, it is only necessary to wash the article with a solution of sal ammoniac. A much more beautiful tint may, however, be obtained by employing a solution composed of equal parts of sulphate of copper and sal ammoniac dissolved in vinegar. A fine black tint may be produced by a slightly warm solution of sulphide of potassium or of sodium. ('Chem. Techn.')

SILVER DUST. *Syn.* SILVER POWDER; ARGENTI CROCUS, A. PULVIS, L. *Prep.* 1. Pure pulverulent silver, obtained by any of the methods explained at page 1043. *Used* to coat pills, by japanners, &c.

2. Heat oxide of silver to dull redness in a porcelain crucible, cool, triturate the powder in an agate mortar, and pass it through a fine sieve. *Used* at the hospital of Montpellier.

SILVER SHELLS. These are prepared and used like gold shells.

SIL′VERING. The art of covering the surfaces of bodies with a thin coating of silver. Leather, paper, wood, &c., are silvered by covering them with silver leaf, by a similar process to that employed for gilding them.

Silvering of Glass. Two distinct methods are adopted for this purpose—one of which consists in employing a layer of tin-foil and mercury, falsely called 'silvering;' the other in using a coating of real silver precipitated from a solution of that metal.

1. Plane surfaces, as those of mirrors, &c., are commonly silvered as follows:—A sheet of tin-foil corresponding to the size of the plate of glass is evenly spread on a perfectly smooth and solid marble table, and every wrinkle on its surface is carefully rubbed down with a brush; a portion of mercury is then poured on, and rubbed over the foil with a clean piece of very soft woollen stuff, or a hare's foot, after which two rules are applied to the edges, and mercury poured on to the depth of a crown-piece, when any oxide on the surface is carefully removed, and the sheet of glass, made perfectly clean and dry, is slid along over the surface of the liquid metal, so that no air, dirt, or oxide, can possibly either remain or get between them. When the glass has arrived at its proper position, gentle pressure is applied, and the table sloped a little to carry off the waste mercury, after which it is covered with flannel and loaded with heavy weights; in 24 hours it is removed to a wooden table and further slanted, and this position is progressively increased during a month, until it becomes perpendicular.

For silvering convex or concave surfaces a mould of plaster of Paris is employed, so that the amalgamated foil may be accurately fitted to the surface.

Globes and other hollow vessels are commonly silvered by the application of one of the silvering amalgams noticed at *page* 84.

2. In the HUMID WAY.—*a.* (Drayton.) A mixture is first made of nitrate of silver (in coarse powder), 1 oz., ammonia, ½ oz., and water, 2 oz., which, after standing for 24 hours, is filtered (the deposit upon the filter, which is silver, being preserved), and an addition is made thereto of spirit (by preference, rectified spirit at 60° o. p.), or naphtha, 3 oz.; from 20 to 30 drops of oil of cassia are then added; and, after remaining for about 6 hours longer, the solution is ready for use. The glass to be silvered (first well cleaned and polished) is placed in a horizontal position, and a wall of putty, or other suitable material, formed around it; the above solution is then poured over it to the depth of from ⅛ to ¼ inch; from 6 to 12 drops of a mixture of oil of cloves and spirit of wine (in the proportion of 1 part, by measure, of oil of cloves, to 3 of spirit of wine) are next dropped into it, at different places; or the diluted oil of cloves may be mixed with the solution before it is poured upon the glass, a larger quantity, in both cases, increasing the rate of the deposit. When the glass is sufficiently silvered, the solution is poured off; and as soon as the silver on the glass is perfectly dry, it is varnished with a composition formed by melting together equal quantities of bees' wax and tallow. The solution, after being poured off, is allowed to stand for 3 or 4 days, in a close vessel; as it still contains silver, and may be again employed after filtration, and the addition of a sufficient quantity of fresh ingredients to supply the place of those which have been used. 18 grs. of nitrate of silver are sufficient for one square foot of glass. Hollow vessels may be silvered by pouring the solution into them. By the addition of a small quantity of oil of caraway, oil of cloves, or oil of thyme, the colour of the silver may be varied. ('Patent Journ.')

b. (Thomson & Mellish.) Nitrate of silver, 2 oz.; water and rectified spirit, of each, 3 fl. oz.; dissolve, add of spirit of hartshorn or liquor of ammonia, 1 fl. oz., mix, and after a short time filter the solution; to each ounce of this add of grape sugar, ¼ oz., previously dissolved in a mixture of rectified spirit and water, of each ½ pint; after 3 or 4 hours' repose it is fit for use. This solution is applied to the glass, heated to about 160° Fahr., in a similar manner to the last. *Patented.*

c. The best plan of silvering plain or slightly curved surfaces is, however, the method employed for coating the specula of the silvered-glass Newtonian telescopes. This method is very easy, and has the advantages of giving a brilliant and durable surface on both sides, and the film is sufficiently firm to admit of being polished with rouge and fine wash-leather.

One ½ oz. of pure nitrate of silver is dissolved in 4 oz. of distilled water, and divided into two equal portions. One is treated with dilute ammonia until the brownish precipitate is entirely redissolved; and to this clear solution, ½ oz. of pure hydrate of potassium dissolved in 8 oz. of water added; and the brown precipitate, and gray sediment that remains after the brown precipitate disappears, dissolved by the cautious addition of ammonia, stirring well all the time. The remaining nitrate of silver solution is now added, stirring well until it gives a grayish precipitate that does not disappear after well stirring. The bulk of the solution is next made up to 100 oz., and allowed to settle, when the clear solution is poured off for use.

The reducing solution is prepared by dissolving ½ oz. of pure milk sugar in 10 oz. of hot water, and adding 10 minims of pure alcohol.

This quantity of silvering solution will coat over two square feet of glass surface with a brilliant film of pure silver. The glass must be perfectly clean, and is to be suspended face downwards on the surface of the solution and allowed to stand one hour; the temperature of the solution being best about 80° Fahr.

Silvering of Metals. 1. (LEAF SILVERING.) This is performed with leaf silver in the way described under GILDING for the gilding of polished metals.

2. (COLD SILVERING.) Mix chloride of silver, 1 part, with pearlash, 3 parts, common salt, 1¼ part, and whiting, 1 part; and well rub the mixture on the surface of the brass or copper (previously well cleaned), by means of a piece of soft leather, or a cork moistened with water and dipped into the powder. When properly silvered, the metal should be well washed in hot water slightly alkalised, and then wiped dry.

3. (ELECTRO-SILVERING.) This is described under ELECTROTYPE.

SIMAROU'BA. *Syn.* SIMARUBA (Ph. E. & D.), L. The root-bark of *Simaruba amara* or *officinalis*, the mountain damson. Tonic, bitter, and astringent.—*Dose.* 20 to 30 grs.; in intermittents, obstinate diarrhœa, dysentery, and dyspepsia.

SIN'AMINE. $C_4H_6N_2$. A basic substance formed, along with sulphide of lead, when thiosinamine is treated with oxide of lead. It is very bitter tasted, has a powerful alkaline reaction, and, when slowly obtained from its concentrated aqueous solution, forms brilliant colourless crystals.

SIN'APISM. *Syn.* SINAPISMUS, L. A mustard poultice.

SIN'APOLINE. $C_7H_{12}N_2O$. A basic substance formed, along with carbonic acid, when the volatile oil of mustard, or sulphocyanide of allyl, is treated with oxide of lead. It is soluble in water and alcohol, has an alkaline reaction, and crystallises in colourless plates.

SIZE. Obtained, like glue, from the skins of animals, but is evaporated less, and kept in the soft state. See GOLD and GOLD SIZE.

SKATE. The *Raia batis* (Linn.). Other varities of *Raia* also pass under the name. It is a coarse fish, and is principally salted and dried for exportation.

SKIN (The). *Syn.* CUTIS, DERMIS, PELLIS, L. Every person must be familiar with the external appearance and general properties of the skin; but there are many of our readers who may not be aware of its peculiar compound character. The skin, then, although apparently a single membrane, is composed of three distinct layers or membranes, each of which performs its special duties:—1. The exterior of these is called the cuticle epidermis, or scarf-skin. It is an albuminous tissue, possessing no sensibility, and is found thickest on those parts of the body most exposed to friction or injury.—2. The mucous net, or rete mucosum, which is a thin layer of soft pulpy matter, which lies immediately under the cuticle, and is supposed to be the seat of the colour of the skin.—3. The derma, cutis vera, or true skin, is a highly sensitive, vascular, gelatinous texture, the third, and last in succession from the surface of the body. It is this which, when the scarf-skin and hair have been removed, is converted by the process of tanning or tawing into leather.

Skin, Goldbeat'er's. See *page* 583.

SKIN COSMET'ICS. The simplest, cheapest, and most generally employed cutaneous cosmetics are soap and water, which at once cleanse and soften the skin. Soap containing a full proportion of alkali exercises a solvent power upon the cuticle, a minute portion ot which it dissolves; but when it contains a small preponderance of oily matter, as the principal part of the milder toilet soaps now do, it mechanically softens the skin and promotes its smoothness. Almond, Naples, and Castile soaps are esteemed for these properties, and milk of roses, cold cream, and almond powder (paste), are also used for a similar purpose. To produce an opposite effect, and to harden the cuticle, spirits, astringents, acids, and astringent salts, are commonly employed. The frequent use of hard water has a similar effect. The application of these articles is generally for the purpose of strengthening or preserving some particular part against the action of cold, moisture, &c.; as the lips, or mammæ, from chapping, or the hands from contracting chilblains; but in this respect, oils, pommades, and other oleaginous bodies, are generally regarded as preferable.

Another class of cutaneous cosmetics are employed to remove freckles and eruptions. Among the most innocent and valuable of these is Gowland's lotion, which has long been a popular article, and deservedly so, for it not only tends to impart a delightful softness to the skin, but is a most valuable remedy for many obstinate eruptive diseases which frequently resist the usual methods of treatment. Bitter almonds have been recommended to remove freckles (Celsus), but moistening them with a lotion made by mixing 1 fl. oz. of rectified spirit, and a teaspoonful of hydrochloric acid with 7 or 8 fl. oz. of water, is said to do this more effectually. A safe and excellent cosmetic is, an infusion of horeradish in cold milk. (Withering.)

Skin paints and skin stains are employed to give an artificial bloom or delicacy to the skin. Rouge and carmine are the articles most generally used to communicate a red colour. The first is the only cosmetic that can be employed, without injury, to brighten a lady's complexion. The other, though possessing unrivalled beauty, is apt to impart a sallowness to the skin by frequent use. Starch powder is employed to impart a white tint, and generally proves perfectly harmless. The American ladies, who are very fond of painting their necks white, use finely powdered magnesia, another very innocent substance. Several metallic compounds, as the trisnitrate, chloride, and oxide of bismuth (pearl white, Fard's white, &c.), carbonate of lead (flake white), white precipitate, &c., are frequently used to revive faded complexions; but they are not only injurious to the skin, but act as poisons if taken up by the absorbents. Trisnitrate of bismuth (pearl white), probably the least injurious of these articles, has been known to cause spasmodic tremblings of the muscles of the face, ending in paralysis. ('Voght. Pharm.') The employment of liquid preparations containing sugar of lead, which are commonly sold under the name of milk of roses, cream of roses, &c., is equally injurious. Another disadvantage of these metallic preparations is, that they readily turn black when exposed to the action of sulphuretted hydrogen gas, or the vapours of sulphur, such as frequently escape into the apartment from coal fires. There are many instances recorded of a whole company being suddenly alarmed by the pearly complexion of one of its belles being thus transformed into a sickly gray or black colour.

In conclusion, it may be remarked that the best purifiers of the skin are soap and water, followed by the use of a coarse but not a stiff cloth, in opposition to the costly and smooth diapers that are commonly employed; and the best beautifiers are health, exercise, and good temper.

SKINS (of Animals). The preparation and preservation of fur skins are noticed under PELTRY; the preparation and uses of the skins of the larger animals under LEATHER, TANNING, TAWING, &c.

SLACK. Small coal, such as is used for kilns.

SLAG. The semi-vitrified compounds, produced, on the large scale, during the reduction of metallic ores by fluxes. Those from iron and copper works are often used for building materials, mending roads, &c.

SLATE. The excellence of this material for water-cisterns deserves a passing notice here.

Irish slate (*lapis Hibernicus*) is an argillaceous mineral, said to contain iron and sulphur, found in different parts of Ireland. It is a common remedy, among the vulgar, for internal bruises, taken in a glass of gin.

SMALLPOX. See Pox.

SMALTS. *Syn.* AZURE, POWDER BLUE, SILICEOUS B., SMALT; AZURUM, SMALTA, L. This consists, essentially, of glass coloured by fusing it with oxide of cobalt.

Prep. 1. Cobalt ore is roasted, to drive off the arsenic, then made into a paste with oil of vitriol, and heated to redness for an hour; the residuum is powdered, dissolved in water, and the ferric oxide precipitated with carbonate of potassium, gradually added, until a rose-coloured powder begins to fall; the clear portion is then decanted, and precipitated with a solution of silicate of potassium (prepared by fusing together, for 5 hours, a mixture of 10 parts of potash, 15 parts of finely ground flints, and 1 part of charcoal); the precipitate, after being dried, is fused, and reduced to a very fine powder. A very rich colour.

2. Roasted cobalt ore and carbonate of potassium, of each, 1 part; siliceous sand, 3 parts; fuse them together, and cool and powder the residuum. Used as a blue pigment, also to colour glass, and for 'blueing' the starch used to get up linen. See BLUE PIGMENTS.

SMELLING SALTS. See SALTS.

SMELT. A beautiful little abdominal fish abounding in the Thames, and a few other rivers, between the months of November and February. It is esteemed a great delicacy by epicures, but sometimes proves offensive to the delicate and dyspeptic.

SMOKE PREVENTION. Although the full consideration of this subject belongs to public hygiene and civil engineering, its immediate application and advantages are interesting and important to everybody.

The history of 'smoke burning' scarcely commences before the year 1840, at which date Mr. Charles Wye Williams obtained a patent for this purpose. Since that time a 'thousand-and-one' schemes, either patented or non-patented, professedly for the same object, have been brought before the public. Most of these have been supported by the most reckless statements regarding their value, made by interested parties; and the most serious inconvenience and losses have often followed their adoption. Williams's method is to admit an abundant supply of cold air through a large number of small perforations in the door and front part of the furnace. Lark's method is based on the admission of heated air, under due regulation, both through the door, and at the bridge or back of the furnace, by which means combustion is rendered more complete, and smoke thereby prevented.

Ivison's plan consists in the introduction of steam by minute jets over the fire, which is thus greatly increased in intensity without the production of smoke, and with a saving of fuel. In Jucke's arrangement the grate-bars of a furnace are replaced by an endless chain web, which is carried round upon two rollers, in such a way that each part of the fuel is exposed to conditions most favorable for perfect combustion. Other inventions are based upon supplying fuel to the fires from beneath, so that the products of combustion must pass through the incandescent coals above.

For household fires, the smokeless grate, invented by Dr. Arnott, will be found entirely successful, and most economical. Its general introduction would be a great advance in both domestic and public hygiene; and, being hence of national importance, should be enforced by law.

SMO′KING. This is done, on the large scale, by hanging up the articles (previously more or less salted) in smoking rooms, into which smoke is very slowly admitted from smothered dry-wood fires, kindled in the cellar, for the purpose of allowing it to cool and deposit its cruder part before it arrives at the meat. This process requires from six days to as many weeks to perform it properly, and is best done in winter. In farm-houses, where dry wood is burnt, hams, &c., are often smoked by hanging them up in some cool part of the kitchen chimney. When the meat is cut into slices, or scored deeply with a knife, to allow the smoke to penetrate it, it is called 'bucaning.'

"The quality of the wood has an influence upon the smell and taste of the smoke-dried meat; smoke from beech wood and oak being preferable to that from fir and larch. Smoke from the twigs and berries of juniper, from rosemary, peppermint, &c., impart somewhat of the aromatic flavour of these plants." (Ure.) The occasional addition of a few cloves or allspice to the fuel gives a very agreeable flavour to the meat.

Hung beef, a highly esteemed variety of smoked beef, is prepared from any part, free from bone and fat, by well salting and pressing it, and then drying and smoking it in the usual manner. It is best eaten shredded. See Putrefaction, Salting, &c.

SNAKE-ROOT. See Senega. For 'Virginian snake-root' see Serpentary. Snake-weed (*Bistortæ radix*) is the root of *Polygonum Bistorta* (Linn.).

SNIPE. The *Scolopax Gallinago*, a well-known bird indigenous to this country. It is fine flavoured, but rather indigestible.

SNUFF. *Syn.* Pulvis tabaci, L.; Tabac en poudre, Fr. A powder, prepared from tobacco, for the purpose of being sniffed up the nose as a stimulant or intoxicant.

The finer kinds of snuff are made from the soft portions of the best description of manufactured leaf-tobacco, separated from the damaged portion; but the ordinary snuffs of the shops are mostly prepared from the coarser and damaged portions, the mid-ribs, stems, or stalky parts, that remain from the manufacture of 'shag tobacco,' the dust or powder sifted from the bales, and the fragments that are unfit for other purposes.

Prep. The proper material being chosen, and if not in a sufficiently mature state rendered so by further fermentation, they are sufficiently dried by a gentle heat or exposure to the air to admit of being pulverised. This is performed, on the large scale, in a mill, and on the small scale, with a kind of pestle and mortar. During the operation the tobacco is frequently sifted, that it may not be reduced to too fine a powder, and is several times slightly moistened with rose or orange-flower water, or eau d'ange, which are the only liquids fit for the superior kinds of snuff. In preparing the dry snuffs, no moisture is used. The scent or other like matters are next added, and, after thorough admixture, the snuff is packed in jars or canisters.

Adult. During the grinding of tobacco it is frequently mixed with dark-coloured rotten wood, various English leaves, colouring, and other matter. Ammonia, hellebore, euphorbium, and powdered glass, are common additions to snuffs to increase their pungency. We have seen powdered sal ammoniac sent by the hundredweight at one time to a certain celebrated London tobacconist. The moist kinds of snuff are generally drugged with pearlash, for the triple purpose of keeping them damp and increasing their pungency and colour. The dry snuffs, especially 'Scotch' and 'Welsh,' are commonly adulterated with quicklime, the particles of which may be occasionally distinguished even by the naked eye. This addition causes their biting and desiccating effect on the pituitary membrane. "We were once severely injured by taking snuff which, after our suspicions were awakened, we found to contain a mixture of red lead and umber." (Cooley.)

Var. Snuffs are divided into two kinds—dry snuffs, as 'Scotch,' 'Irish,' 'Welsh,' and 'Spanish snuff,' 'Lundyfoot,' &c.; and—moist snuffs, or rappees, including 'black' and 'brown rappee,' 'carotte,' 'Cuba,' 'Hardham's mixture,' 'prince's mixture,' 'princeza,' 'queen's snuff,' &c. The last three also come under the denomination of scented snuffs.

The immense variety of snuffs kept in the shops, independently of the above-named conditions, depend for their distinguishing characteristics on the length of the fermentation, the fineness of the powder, the height to which they are dried, and the addition of odorous substances. Tonquin beans, essence of tonquin bean, ambergris, musk, civet, leaves of orchis fusca, root and oil of calamus aromaticus, powder and essence of orris root, and the essences or oils of bergamot, cedra, cloves, lavender, petit grain, neroli, and roses (otto), as well as several others, either alone or compounded, are thus employed. Tabac parfumée aux fleurs is perfumed by putting orange flowers, jasmins, tuberoses, musk roses, or common roses, to the snuff in a close chest or jar, sifting them out after 24 hours, and repeating the treatment with fresh flowers, as necessary. Another way is to lay paper, pricked all over with a large pin, between the flowers and the snuff.

Macouba snuff is imitated by moistening the tobacco with a mixture of treacle and water, and allowing it to ferment well.

Spanish snuff is made from unsifted 'Havannah snuff,' reduced by adding ground

Spanish nutshells, sprinkling the mixture with treacle water, and allowing it to sweat for some days before packing.

YELLOW SNUFF is prepared from ordinary pale snuff moistened with a mixture of yellow ochre diffused in water, to which a few spoonfuls of thin mucilage have been added; when dry, the colour that does not adhere to the snuff is separated with a fine sieve.

RED SNUFF. As last, but using red ochre.

Snuff, Asarabac′ca. *Syn.* CEPHALIC SNUFF, COMPOUND POWDER OF ASARABACCA; PULVIS ASARI COMPOSITUS, L. *Prep.* 1. (Ph. D. 1826.) Asarabacca leaves, 1 oz.; lavender flowers, 1 dr.; (both dried;) mix and powder them.

2. (Ph. E. 1817.) Asarabacca leaves, 3 drs.; leaves of marjoram and flowers of lavender, of each, 1 dr.; as before. Both are used as errhines in headaches and ophthalmia. See CEPHALIC SNUFF, ASARABACCA, &c.

Snuff, Chephal′ic. *Prep.* 1. From asarabacca leaves and Lundyfoot snuff, of each, 2 oz.; lavender flowers, ¼ oz.; essence of bergamotte and oil of cloves, of each, 2 or 3 drops; mixed and ground to a powder, the perfume being added last.

2. (Boeli's.) From tobacco or pure snuff and valerian root, of each, ½ oz.; reduced to powder, and scented with the oils of lavender and marjoram, of each, 5 or 6 drops.

Obs. The first formula is an excellent one; and the product is very useful in nervous headaches, dimness of sight, &c. See ASARABACCA SNUFF (*above*).

Snuff, Eye. *Prep.* From finely levigated tribasic sulphate of mercury ('Turpeth mineral'), ½ dr.; pure dry Scotch or Lundyfoot snuff, 1 oz.; triturate them well together. A pinch of this, occasionally, has been recommended in inflammation of the eyes, dimness of sight, headache, polypus, &c.; but it should be used with caution, and not too often.

SOAP. *Syn.* SAPO, L.; SAVON, Fr. SPANISH, CASTILE, or HARD SOAP, made with olive oil and soda (SAPO, SAPO EX OLIVÆ OLEO ET SODÂ CONFECTUS—Ph. L.; SAPO DURUS—B. P., Ph. E. & D.), and SOFT SOAP, made with olive oil and potash (SAPO MOLLIS—B. P., Ph. L. & E., SAPO EX OLIVÆ OLEO ET POTASSÂ CONFECTUS—Ph. L.), are the only kinds directed to be employed in medicine. The former is intended whenever 'soap' is ordered, and is the one which is principally employed internally; the latter is used in ointments, &c., and in some of the officinal pills.

Prep. The fatty or oleaginous matter is boiled with a weak alkaline lye (soap-lye) rendered caustic by quicklime, and portions of stronger lye are added from time to time, the ebullition being still continued, until these substances, reacting on each other, combine to form a tenacious compound, which begins to separate from the water; to promote this separation and the granulation of the newly formed soap, some common salt is generally added, and the fire being withdrawn, the contents of the boiler are allowed to repose for some hours, in order that the soap may collect into one stratum, and solidify; when this happens it is put into wooden frames or moulds, and when it has become stiff enough to be handled it is cut into bars or pieces, and exposed to the air, in a warm situation, to further harden and to dry.

Var. The principal varieties of soap found in commerce are:—

ALMOND SOAP (SAPO AMYGDALINUS), made from almond oil and caustic soda, and chiefly used for the toilet.

CASTILE SOAP, SPANISH S., MARSEILLES S.; SAPO CASTILIENSIS, SAPO HISPANICUS. An olive-oil soda soap, kept both in the white and marbled state. The former is said to be the purest; the latter, the strongest.

CURD SOAP, made with tallow (chiefly) and soda.

MEDICATED SOAPS, containing various active ingredients. The chief of these are noticed *below*.

MOTTLED SOAP, made with refuse kitchen-stuff, &c.

SOFT SOAP (of commerce), made with whale, seal, or cod oil, tallow, and caustic potash.

TOILET SOAPS, prepared from any of the preceding varieties, and variously coloured and scented. Formulæ are given *below*.

YELLOW SOAP, RESIN SOAP, made with tallow, resin, and caustic soda. Soluble glass is now largely employed in place of resin.

Soaps are also divided into SOFT or POTASH SOAPS and HARD or SODA SOAPS.

Assay. 1. For the WATER. A piece, fairly taken from the sample, and weighing 100 grs., is reduced to thin shavings, which are dried by the heat of boiling water, until they cease to lose weight. The loss indicates the proportion of free water. This should not exceed 35% for ordinary curd and mottled soap, 45% for yellow soap, and about 15 to 16% for Castile soap.

2. For the ALKALI. 100 grs. of the soap are dissolved in 4 or 5 fl. oz. of boiling water, and the solution tested by the common method of alkalimetry. Curd and yellow soap usually contain from 6 to 7%, mottled soap from 7 to 8%, and Castile soap 8 to 9% of soda.

3. For the OIL or FAT. The solution tested for alkali (see No. 2) is heated, and then allowed to cool slowly; when cold, the floating fatty matter is removed, freed from water, and weighed. When the fat or oil has little consistence, 100 grs. of pure white wax is added to the soap solution, before heating it. The weight obtained, in grains in the one case, and the excess above 100 grs. in the other, give the proportion of oil or fat present. This, in ordinary mottled soap, should be about 68%; in yellow soap, 65%; in curd soap, 60%; and in Castile soap, 75%.

4. UNSAPONIFIED FATTY MATTER.—*a.* Pure soap is entirely soluble in distilled water and insoluble in saline solution; if a film of fatty matter forms on its solution in the former, after repose, that portion has not been saponified.

b. The fat separated from soap (see No. 2), when it has been perfectly saponified, is entirely soluble in alcohol.

5. OTHER IMPURITIES. Pure soap is soluble in rectified spirit, forming a colourless or nearly colourless solution. The undissolved portion, if exceeding 1%, is adulteration.

Uses, &c. The common uses of soap need not be enumerated. As a medicine, it acts as a mild purgative and lithontriptic, and it has been thought by some to be useful in certain affections of the stomach arising from deficiency of bile. *Externally,* it is stimulant and detergent.—*Dose.* 3 to 20 or 30 grs., made into pills, and usually combined with aloes or rhubarb.

Concluding remarks. Prior to the researches of Chevreul, no correct ideas were entertained as to the constitution of soap. It was long known that the fixed oils and fats, in contact with caustic alkaline solutions at a high temperature, undergo the remarkable change which is called saponification; but here the knowledge of the matter stopped. Chevreul discovered that if the soap, so produced, be afterwards decomposed by the addition of an acid, the fat which separates is found to be completely changed in character; to have acquired a strong acid reaction when applied in a melted state to test paper, and to have become soluble with the greatest facility in warm alcohol; in other words—that a new substance, capable of forming salts, and exhibiting all the characteristic properties of an acid, has been generated out of the elements of the neutral fat under the influence of the base. Stearin, when thus treated, yields stearic acid, palmatin gives palmatic acid, olein gives oleic acid, and common animal fat, which is a mixture of several neutral bodies, affords, by saponification by an alkali and subsequent decomposition of the soap, a mixture of the corresponding fatty acids. These bodies are not, however, the only products of saponification; the change is always accompanied by the formation of a very peculiar sweet substance, called glycerin, which remains in the mother-liquor from which the acidified fat has been separated. The process of saponification itself proceeds with perfect facility, even in a closed vessel; no gas is disengaged; the neutral fat, of whatsoever kind, is simply resolved into an alkaline salt of the fatty acid, which is soap, and into glycerin, a neutral body resembling syrup, and, like that liquid, miscible with water in every proportion.

"When yellow soap is made with the cheaper kinds of fat, it will hardly acquire a sufficient degree of firmness or hardness to satisfy the thrifty washerwoman. It melts away too rapidly in hot water, a defect which may be well remedied by the introduction into the soap of a little (1-20th) fused sulphate of soda; and this salt concreting, gives the soap a desirable hardness, whilst it improves its colour, and renders it a more desirable article for the washing tub." (Ure.) This process was patented by Dr. Normandy, but soon proved a source of annoyance and molestation to him on the part of the Board of Excise, it being an enormous crime in law to attempt to improve and cheapen soap.

"Soda which contains sulphurets is preferred for making mottled or marbled soap, whereas the desulphuretted soda makes the best white curd soap." "The Barillas always contain a small proportion of potash, to which their peculiar value, in making a less brittle or more plastic hard soap than the factitious sodas, may, with great probability, be ascribed." (Ure.)

The mottled appearance is usually given, in the London Soap-works, by watering the nearly finished soap with a strong lye of crude soda, by means of a watering can furnished with a rose spout. For 'Castile soap,' a solution of sulphate of iron is so employed. See SOAPS (Medicated and Toilet).

Soap, Arsen'ical. *Syn.* SAPO ARSENICALIS, L. *Prep.* (Bécœurs.) From carbonate of potash, 12 oz.; white arsenic, white soap, and air-slaked lime, of each, 4 oz.; powdered camphor, ¾ oz.; made into a paste with water, q. s. *Used* to preserve the skins of birds, and other small animals.

Soap, Black. *Syn.* SAPO NIGER, S. MOLLIS COMMUNIS, L. A crude soft soap, made of fish oil and potash; but the following mixture is usually sold for it:—soft soap, 7 lbs.; train oil, 1 lb.; water, 1 gall.; boil to a proper consistence, adding ivory black or powdered charcoal, q. s. to colour. *Used* by farriers.

SOAPS (Med'icated). A few only of these deserve notice here:—

Soap, Antimo''nial. *Syn.* SAPO ANTIMONIALIS, SAPO STIBIATUS, L. *Prep.* (Hamb. Cod. 1845.) Golden sulphuret of antimony, 2 drs.; solution of caustic potassa, 6 drs. (or q. s.); dissolve and triturate the solution with medicated (Castile) soap (in powder), 1¼ oz., until the mass assumes a pilular consistence. It should be of a grayish-white colour.

Soap, Chlorina'ted. *Syn.* SAPO CALCIS CHLORINATÆ, L.; SAVON ANTISYPHILITIQUE, Fr. *Prep.* From Castile soap (in powder), 11 oz.; chloride of lime (dry and good), 1 oz.; mix, beat them to a mass with rectified spirit, q. s.; (holding in solution) oil of verbena or of ginger grass, ¼ oz.; lastly, form the mass into flat tablets, and wrap these in thin sheet gutta percha. A most excellent detergent and stimulant soap in various affections, admirably adapted for hospital use, and for removing stains from the skin and rendering it white. It is the most powerful known agent against infection from contagious diseases communicable by contact.

Soap, Cro'ton. *Syn.* SAPO CROTONIS, L. *Prep.* From croton oil and liquor of potassa, equal parts; triturated together in a warm mortar until they combine. Cathartic.—*Dose.* 1 to 3 grs.

Soap of Gua'iacum. *Syn.* SAPO GUAIACI, SAPO GUAIACINUS, L. *Prep.* (Ph. Bor.) Liquor of potassa, 1 oz.; water, 2 oz.; mix in a porcelain capsule, apply heat, and gradually add of resin of guaiacum (in powder), 6 drs., or as much as it will dissolve; next decant or filter, and evaporate to a pilular consistence. —*Dose.* 10 to 30 grs.; in chronic rheumatism, various skin diseases, &c.

Soap, I'odine. *Syn.* SAPO IODURATUS, L. *Prep.* From Castile soap (sliced), 1 lb.; iodide of potassium, 1 oz.; (dissolved in) water, 3 fl. oz.; melt them together in a glass or porcelain vessel, over a water bath. Excellent in various skin diseases; also as a common soap for scrofulous subjects.

Soap of Jal'ap. See page 663.

Soap, Macquer's Acid. *Syn.* SAPO VITRIOLICUS, L. *Prep.* From Castile soap, 4 oz., softened by heat and a little water, and then continually triturated in a mortar with oil of vitriol (added drop by drop). Detergent. *Used* where alkalies would be prejudicial.

Soap, Mercu''rial. *Syn.* SAPO MERCURIALIS, L. *Prep.* 1. (SAPO SUBLIMATIS CORROSIVI.) From Castile soap (in powder) 4 oz.; corrosive sublimate, 1 dr.; (dissolved in) rectified spirit, 1 fl. oz.; beaten to a uniform mass in a porcelain or wedgwood-ware mortar.

2. (SAPO HYDRARGYRI PRECIPITATI RUBRI —Sir H. Marsh.) From white Windsor soap, 2 oz.; nitric oxide of mercury (levigated), 1 dr.; otto of roses, 6 or 8 drops; (dissolved in) rectified spirit, 1 to 2 fl. drs.; as the last. Both the above are employed as stimulant detergents and repellants, in various skin diseases; also as SAVON ANTISYPHILITIQUE.

Soap, Sul'phuretted. *Syn.* SAPO SULPHURIS, SAPO SULPHURATUS, L. *Prep.* (Sir H. Marsh.) From white soap, 2 oz.; sublimed sulphur, ¼ oz.; beaten to a smooth paste in a marble mortar with 1 or 2 fl. drs. of rectified spirit strongly coloured with alkanet root, and holding in solution otto of roses, 10 or 12 drops. In itch and various other cutaneous diseases.

Soap, Tar. *Syn.* SAPO PICIS LIQUIDÆ, SAPO PICEUS, L. *Prep.* From tar, 1 part; liquor of potassa and soap (in shavings), of each, 2 parts; beat them together until they unite. Stimulant. *Used* in psoriasis, lepra, &c.

Soap, Tur'pentine. *Syn.* STARKEY'S SOAP; SAPO TEREBINTHINÆ, S. TEREBINTHINATUS, L.; SAVON TÉRÉBINTHINE, Fr. *Prep.* (P. Cod.) Subcarbonate of potash, oil of turpentine, and Venice turpentine, equal parts; triturate them together, in a warm mortar, with little water, until they combine; put the product into paper moulds, and in a few days slice it, and preserve it in a well-stopped bottle.

SOAPS (Toilet). Of Toilet soaps there are two principal varieties:—

1. (HARD.) The basis of these is, generally, a mixture of suet, 9 parts, and olive oil, 1 part, saponified by caustic soda; the product is variously scented and coloured. They are also made of white tallow, olive, almond, and palm-oil soaps, either alone or combined in various proportions, and scented.

2. (SOFT.) The basis of these is a soap made of hog's lard and potash, variously scented and coloured.

On the small scale, the perfume is generally added to the soap melted in a bright copper pan by the heat of a water bath; on the large scale, it is mixed with the liquid soap, at the soap-maker's, before the latter is poured into the frames.

The following are examples of a few of the leading toilet soaps:[1]—

Soap, Bitter-al'mond. *Syn.* SAVON D'AMANDE, Fr. *Prep.* From white tallow soap, 56 lbs.; essential oil of almonds, ¾ lb.; as before.

Savon au Bouquet. [Fr.] *Prep.* From tallow soap, 30 lbs.; olive-oil soap, 10 lbs.; essence of bergamot, 4 oz.; oils of cloves, sassafras, and thyme, of each, 1 oz.; pure neroli, ½ oz.; brown ochre (finely powdered), ¼ lb.; mixed as the last.

Soap, Cin'namon. *Prep.* From tallow soap, 14 lbs.; palm-oil soap, 7 lbs.; oil of cinnamon (cassia), 3 oz.; oil of sassafras and essence of bergamot, of each, ¼ oz.; levigated yellow ochre, ½ lb.

Soap, Float'ing. *Prep.* From good oil soap, 14 lbs.; water, 3 pints; melted together by the heat of a steam or water bath, and assiduously beaten until the mixture has at least doubled its volume, when it must be put into the frames, cooled, and cut into pieces. Any scent may be added.

Soap, Hon'ey. *Prep.* 1. From palm-oil soap and olive-oil soap, of each, 1 part; curd soap, 3 parts; melted together and scented with the oil of verbena, rose-geranium, or ginger-grass.

2. From the finest bright-coloured yellow soap, scented with the oils of ginger-grass and bergamot.

Soap, Musk. As CINNAMON SOAP, but with essence of musk, supported with a little essence of bergamot and oil of cloves, as perfume, and burnt sugar, to colour.

Soap, Naples. From olive oil and potash.

Soap, Orange-flower. As SAVON À LA ROSE, with oil of neroli or essence de petit grain, supported with a little of the essences of ambergris and Portugal, for perfume.

Soap, Palm-oil. *Syn.* VIOLET SOAP. Made of palm oil and caustic soda lye. It has a pleasant odour of violets and a lively colour.

Soap, Pearl. *Syn.* ALMOND CREAM; CRÊME

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[1] See also SAVONETTES.

D'AMANDES, Fr. *Prep.* From a soap made of lard and caustic potash lye; when quite cold, it is beaten in small portions at a time in a marble mortar, until it unites to form a homogeneous mass, or 'pearls,' as it is called; essence of bitter almonds, q. s., to perfume, being added during the pounding.

§ **Savon à la Rose.** [Fr.] *Prep.* From a mixture of olive-oil soap, 36 lbs.; best tallow soap, 24 lbs.; (both new and in shavings;) water, 1 quart; melted in a covered bright copper pan, by the heat of a water bath, then coloured with vermilion (finely levigated), 2½ oz.; and, after the mixture has cooled a little, scented with otto of roses, 3 oz.; essence of bergamot, 2½ oz.; oils of cloves and cinnamon, of each, 1 oz.

Soap, Sha″ving. See PASTE (Shaving).

Soap, Transpa″rent. *Prep.* From perfectly dry almond, tallow, or soft soap, reduced to shavings, and dissolved, in a closed vessel or still, in an equal weight of rectified spirit, the clear portion, after a few hours' repose, being poured into moulds or frames; after a few weeks' exposure to a dry atmosphere, the pieces are 'trimmed up' and stamped, as desired. It may be scented and coloured, at will, by adding the ingredients to it while in the soft state. A rose colour is given by tincture of archil; and yellow, by tincture of turmeric or annotta. It does not lather well.

Soap, Windsor. *Syn.* SAPO VINDESORÆ, S. VINDESORIENSIS, L. *Prep.* 1. (WHITE; S. V. ALBUS.) The best 'English' is made of a mixture of olive oil, 1 part, and ox tallow or suet, 9 parts, saponified by caustic soda. 'French Windsor-soap' is made of hog's lard, with the addition of a little palm oil. That of the shops is merely ordinary curd soap, scented with oil of caraway, supported with a little oil of bergamot, lavender, or origanum. To the finer qualities a little of the essences of musk and ambergris is occasionally added. 1¼ lb. of the mixed scents is the common proportion per cwt.

2. (BROWN; S. V. FUSCUS.) This merely differs from the last in being coloured with burnt sugar, or (less frequently) with umber. Originally, it was the white variety, that had become mellow and brown with age.

SO′DA. See SODIUM.

SO′DIUM. Na. *Syn.* NATRIUM. The metallic base of soda. It was first obtained by Sir H. Davy, in 1807, by means of a powerful galvanic battery; but it may be more conveniently and cheaply procured, in quantity, by the method described under POTASSIUM. The process, when well conducted, is, however, much easier and more certain than that for the last-named metal.

Prep. The anhydrous carbonate of sodium, 6 parts, is dissolved in a little water, and the solution mixed with charcoal in fine powder, 2 parts, and charcoal in small lumps, 1 part; the whole is then evaporated to dryness, transferred to an iron retort, and treated in the manner described at page 961.

Obs. Very important improvements have been made in the manufacture of this metal by Deville, consisting partly in the simplification of the receiver, and partly in the addition of carbonate of calcium to the mixture, which addition appears to facilitate the reduction of the sodium in a most remarkable manner.

Prop., &c. Sodium is a soft silver-white metal, scarcely solid at common temperatures, fuses at 194° Fahr., and volatilises at a red heat; it oxidises very rapidly in the air; when placed on the surface of cold water, it decomposes that liquid with great violence, but generally without flame, in which it differs from potassium; on hot water it burns with a bright yellow flame—in both cases a solution of pure soda being formed. Sp. gr. ·972; it is more malleable than any other metal, and may be easily reduced into very thin leaves (Ure); its other properties resemble those of potassium, but are of a feebler character. With oxygen it forms two oxides; with chlorine, a chloride (common salt); and—with bromine, iodine, fluorine, &c., bromide, iodide, fluoride, &c., all of which may be obtained by similar processes to the respective compounds of potassium, which, for the most part, they resemble.

Uses. Until recently, sodium has been regarded as a mere mechanical or philosophical curiosity; it has now, however, become of great practical importance, from being employed in the manufacture of the metals aluminium, magnesium, &c.

Tests. Sodium salts are recognised by their solubility in water, and by their giving a precipitate with none of the ordinary reagents. They give a rich yellow colour to the colourless Bunsen or the pale blue blowpipe flame. They can, to a certain extent, be also distinguished from potassium salts by the carbonate being an easily crystallisable salt, efflorescing in dry air; the carbonate of potassium being crystallised with difficulty, and deliquescent. Platinum chloride does not give a precipitate with sodium chloride; neither does picric acid, perchlorate of ammonium, nor tartaric acid.

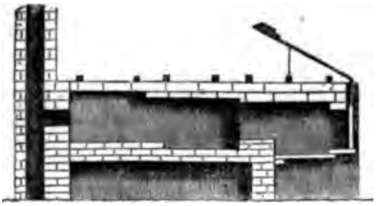
Sodium, Acetate of. $NaC_2H_3O_2$. *Syn.* ACETATE OF SODA; SODÆ ACETAS (B. P., Ph. D.), L. Prepared from carbonate of sodium as the corresponding potassium salt; but the resulting solution is evaporated to a pellicle, and set aside to crystallise. Its crystals are striated oblique rhombic prisms; it effloresces slightly in the air, and is soluble in 4 parts of water at 60° Fahr. Diuretic.—*Dose.* 20 to 40 grs.

Sodium, Arseniates of. These salts are made, and their properties and doses are the same, as the corresponding potassium salts.

Sodium, Carbonate of. $Na_2CO_3.10Aq$. *Syn.* CARBONATE OF SODA, MONO-CARBONATE OF SODA, SUBCARBONATE OF S.†, SALT OF BARILLA†; SODÆ CARBONAS (B. P., Ph. L. E. & D.), L. The carbonate of sodium of commerce (WASH-

ING SODA) was formerly prepared from the ashes of seaweed, and other marine vegetables, in a somewhat similar manner to that by which carbonate of potassium is obtained; but it is now usually obtained from chloride of sodium, by the action of heat, sulphuric acid, and carbonaceous matter.

Prep. (From common salt or sulphate of sodium.) The latter is generally obtained by decomposing the former with sulphuric acid, the evolved gas being passed into water, or through flues filled with coke, over which a very small stream of cold water constantly flows, by which it is condensed, and forms 'LIQUID HYDROCHLORIC ACID,' a substance afterwards consumed, in large quantities, in the manufacture of chloride of lime, and for other purposes. The sulphate of sodium, obtained from this or any other source, is well mixed with an equal weight of chalk or limestone, and about half its weight of small coal, each being previously ground to powder, and the mixture is exposed to a strong heat in a 'reverbatory furnace' (see *engr.*) until the decomposition of the sulphate is complete, the mass during the calcination being frequently stirred about with a long iron rod; the semi-liquid is now raked into an iron trough, where it is allowed to cool, whilst the furnace is re-charged with fresh materials. The crude dark-gray product, thus obtained, is known as 'ball alkali,' or 'British barilla,' and usually contains about 22 or 23% of pure hydrate of sodium. This is now lixiviated with tepid water, and the solution, after defecation, evaporated to dryness; the residuum is mixed with a certain quantity of sawdust, coal-dust, or charcoal, and roasted in a reverberatory furnace, at a heat not exceeding 700° Fahr., until all the sulphur is expelled. The product is the 'soda-ash,' 'soda salt,' or 'British alkali,' of commerce, and contains about 50% of pure sodium, partly in the state of carbonate, and partly as hydrate, the remainder being chiefly sulphate of sodium and common salt. When this is purified by solution in water, defecation, evaporation, and crystallisation, it furnishes commercial crystallised carbonate of soda. When this last is redissolved, and the filtered solution is carefully crystallised, it constitutes the ordinary carbonate of sodium used in pharmacy and medicine.



Scotch Soda Furnace.

When it is required anhydrous (SODÆ CARBONAS EXSICCATA, B. P., Ph. L.; SODÆ CARBONAS SICCATUM, Ph. E. & D.), the crystallised carbonate is heated to redness, and, when cold, powdered.

Prop., &c. Carbonate of sodium forms large, transparent, oblique rhombic prisms, which, as ordinarily met with, and of the formulæ $Na_2CO_3 . 10Aq$; but by particular management may be had with fifteen, nine, seven, or sometimes with only one molecule of water of crystallisation (Fownes); it is soluble in twice its weight of water at 60°, and less than an equal weight at 212° Fahr. As a medicine, it is deobstruent and antacid, and is given in *doses* of 10 to 30 grs. It is also, occasionally, used to make effervescing draughts. When taken in an overdose, it is poisonous. The antidotes are the same as for carbonate of potassium. The crude carbonate is largely employed in the manufacture of soap, glass, &c.

53 grs. of the dried carbonate are equal to 143 of the crystallised salt. The medicinal properties of both are similar. It has, however, the disadvantage of being difficultly soluble in water.

The ordinary carbonate of sodium generally contains either sulphates or chlorides, or both; and these may be detected as under CARBONATE OF POTASSIUM. "When supersaturated with nitric acid, it precipitates only slightly or not at all, chloride of barium or nitrate of silver; and 143 grs. require at least 960 grain-measures of solution of oxalic acid" (B. P.). At a high temperature, 100 grs. lose 62·5 grs. of water.

Sodium, Sesquicarbonate of. $Na_4H_2(CO_3)_3$. A salt found native on the banks of the soda lakes of Sotrena, in Africa, whence it is exported as "Trona."

Sodium, Bicarbonate of. $NaHCO_3$. *Syn.* SESQUICARBONATE OF SODA, SODÆ BICARBONAS (B. P., Ph. L. E. & D.). This salt can be prepared in exactly the same manner as the corresponding salt of potassium. Another method is as follows:—Take of crystallised carbonate of sodium, 1 part; dried carbonate of sodium, 2 parts; (both in powder;) triturate them well together, and surround them with an atmosphere of carbonic acid gas, under pressure; let the action go on until no more gas is absorbed, which will generally occupy 10 to 14 hours, according to the pressure employed), then remove the salt, and dry it at a heat not above 120° Fahr.

Prop., &c. A crystalline white powder; it is soluble in 10 parts of water at 60° Fahr., but it cannot be dissolved in even warm water without partial decomposition; it is more pleasant tasted and more feebly alkaline than the carbonate of the same base. When absolutely pure, it does not darken turmeric paper, or only very slightly. The dose is from 10 to 40 grains, as an antacid and absorbent. It is much employed in the preparation of effervescing powders and draughts, for which purpose

20 grs. of commercial bicarbonate of sodium

are taken with

18 grs. of crystallised tartaric acid;
17 grs. of crystallised citric acid; or
½ fl. oz. of lemon juice.

The quantity of bicarbonate any given sample contains may be approximately determined by well washing 100 grs. of the salt with an equal weight of water, and filtering the solution. The residuum left upon the filter, dried at a heat of 120° Fahr., and weighed, gives the per-centage of pure bicarbonate of sodium present (very nearly). The solution of this in water will give only a very trifling white precipitate with corrosive sublimate; whilst the filtered portion, which was used to wash the salt, will give a red one, if it contains the simple carbonate of sodium.

Sodium, Chloride of. NaCl. *Syn.* SODII CHLORIDUM (B. P., Ph. L. & D.), SODÆ MURIAS (Ph. E.), L. This important and wholesome compound appears to have been known in the earliest ages of which we have any record. It is mentioned by Moses (Gen. xix, 26), and by Homer in the Iliad (lib. ix, 214). In ancient Rome it was subjected to a duty (*vectigal salinarium*); and, even at the present day, a similar tax furnishes no inconsiderable portion of the revenue of certain nations. Common salt forms no small portion of the mineral wealth of England, and has become an important article of commerce in every part of the known world. The principal portion of the salt consumed in this country is procured by the evaporation of the water of brine springs. It is also prepared by the evaporation of sea-water (hence the term 'sea-salt'), but this process has been almost abandoned in England, being more suited to hot dry climates or to very cold ones.

Var.—BAY SALT; SAL MARINUS, SAL NIGER; imported from France, Portugal, and Spain, and obtained from sea-water evaporated in shallow ponds by the sun; large-grained and dark-coloured.—BRITISH BAY SALT, CHESHIRE LARGE-GRAINED S.; by evaporating native brine at a heat of 130° to 140° Fahr.; hard cubical crystals. Both of the above are used to salt provisions for hot climates, as they dissolve very slowly in the brine as it grows weaker. CHESHIRE STOVED SALT, LUMP S., BASKET S.; obtained by evaporating the brine of salt springs; small flaky crystals.—LONDON'S PATENT SOLID SALT; Cheshire rock salt, melted and ladled into moulds.—ROCK SALT, FOSSIL S.; SAL GEMMÆ, SAL FOSSILIS; found in mineral beds in Cheshire; has commonly a reddish colour; chiefly exported for purification.

Prop. Pure chloride of sodium is fixed in the air; crystallises in anhydrous cubes, which are often grouped into pyramids or steps; dissolves in about 2½ parts of water at 60° Fahr.; its solubility is not increased by heat; it is slightly soluble in proof spirit; insoluble in alcohol; decrepitates when heated; fuses at a red heat, and volatilises at a much higher temperature.

Pur., &c. The common salt of commerce contains small portions of chloride of magnesium, chloride of calcium, and sulphate of calcium; and hence has commonly a slightly bitter taste, and deliquesces in the air. To separate these, dissolve the salt in 4 times its weight of pure water, and drop into the filtered solution, first, chloride of barium, and then carbonate of sodium, as long as any precipitate falls; filter, and evaporate the clear fluid very slowly, until the last crystallises, which is pure chloride of sodium. ('Thomson's Chem.,' ii, 377.) For medical purposes, the Ph. E. orders the salt to be dissolved in boiling water, and the solution to be filtered and evaporated over the fire, skimming off the crystals as they form, which must then be quickly washed in cold water, and dried. A solution of pure salt is not precipitated by a solution of carbonate of ammonium, followed by a solution of phosphate of sodium; a solution of 9 grs. in distilled water is not entirely precipitated by a solution of 26 grs. of nitrate of silver. (Ph. E.)

Uses. Common salt is stimulant, antiseptic, and vermifuge, and is hence employed as a condiment, and for preserving animal and vegetable substances. It is also occasionally used in medicine, in clysters and lotions.

Sodium, Iodide of. NaI. *Syn.* SODII IODIDUM. *Prep.* As IODIDE OF POTASSIUM. This, as well as the bromide, crystallises in clear or whitish cubes, deliquescent, and soluble in water. *Used* in medicine, in the same manner as the corresponding potassium salts.

Sodium, Hydrate of. NaHO. *Syn.* HYDRATE OF SODA, SODIUM HYDRATE, CAUSTIC SODA; SODÆ HYDRAS. *Prep.* Exactly in the same manner from carbonate of sodium as potassium hydrate is prepared from carbonate of potassium.

Grayish, semi-translucent, deliquescent masses, very soluble in water, and bearing a very great resemblance to the corresponding potassium compound.

Sodium, Hypochlo″rite of. *Syn.* CHLORINATED SODA, CHLORIDE OF SODA‡; SODA CHLORINATA, L. *Prep.* (Dr. Christison.) Dried carbonate of sodium, 19 parts, are triturated with water, 1 part, and the mixture placed in a proper vessel, and exposed to the prolonged action of chlorine gas, generated from a mixture of chloride of sodium, 10 parts; binoxide of manganese, 8 parts; sulphuric acid, 14 parts; (diluted with) water, 10 parts.

Sodium, Hyposul'phate of. $Na_2S_2O_3$. *Syn.* SODÆ HYPOSULPHIS, L. *Prep.* 1. Dried carbonate of sodium, 1 lb.; flower of sulphur, 10 oz.; mix, and slowly heat the powder in a porcelain dish until the sulphur melts; stir the fused mass freely to expose it to the atmosphere, until the incandescence flags, then dissolve the mass in water, and immediately boil the filtered liquid with some flowers of sulphur; lastly, carefully concentrate the solution for crystals.

2. A stream of well-washed sulphurous anhydride gas is passed into a strong solution of carbonate of sodium, which is then digested with sulphur at a gentle heat during several days; by evaporating the solution at a moderate temperature, the salt is obtained in large and regular crystals.

3. (Capaun's process.) Boil a dilute solution of caustic soda with sulphur to saturation, then pass sulphurous acid gas into the solution until a small portion, when filtered, is found to have a very pale yellow colour; when this is the case, it must be filtered and evaporated, as before.

4. (P. Cod.) Dissolve carbonate of sodium, 8 parts, in water, 16 parts; add of sublimed sulphur, 1 part, and pass sulphurous acid gas, in excess, into the solution; next boil the liquid in a glass matrass for a few minutes, filter, gently evaporate the filtrate to 1-3rd its volume, and set it aside in a cool place to crystallise.

Prop., &c. Hyposulphite of sodium crystallises in four-sided prisms, which, in the dry state, are unalterable in the air; it is freely soluble in water. It may be perfectly freed from sulphide of sodium by agitating it with about half its weight of alcohol; the alcohol dissolves out the sulphide, which may then be easily separated. This salt is now very extensively used in the practice of photography, also as an 'antichlore,' to extract the last traces from paper pulp.

Sodium, Ni'trate of. $NaNO_3$. *Syn.* CHILI SALTPETRE, CUBIC NITRE; SODÆ NITRAS, L. This salt occurs native like ordinary nitre, and is chiefly imported into England from South America. It is largely employed as a manure, in the preparation of nitric acid, and, recently, in the manufacture of fireworks, on account of the comparative slowness with which it burns. It is deliquescent and very soluble in water.

Sodium, Oxide of. Na_2O. *Syn.* ANHYDROUS SODA. *Prep.* By burning dry metallic sodium in air. White powder, very deliquescent, and soluble in water, forming pure sodium hydrate.

Sodium, Phos'phate of. $Na_2HPO_4 . 12Aq$. *Syn.* COMMON TRIBASIC PHOSPHATE OF SODA, RHOMBIC P. OF S.; SODÆ PHOSPHAS (B. P., Ph. L. E. & D.). *Prep.* 1. (Ph. E.) Take of powdered bone ashes, 10 lbs.; sulphuric acid, 44 fl. oz.; mix, add gradually of water, 6 pints, and digest for 3 days, replacing the water which evaporates; then add 6 pints of boiling water, strain through linen, and wash the residue on the filter with boiling water; mix the liquors, and, after defecation, decant and evaporate to 6 pints; let the impurities again settle, and neutralise the clear fluid, heated to boiling, with a solution of carbonate of sodium in slight excess; crystals will be deposited as the solution cools, and by successively evaporating, adding a little more carbonate of sodium to the mother-liquor till it is feebly alkaline, and cooling, more crystals may be obtained; these must be kept in closed vessels. The formula of the Ph. D. is nearly similar. It is placed in the Materia Medica of the B. P. & Ph. L.

2. (Funcke.) To ground calcined bones, diffused through water, add a little dilute sulphuric acid to saturate any carbonate of calcium present; when effervescence ceases, dissolve the whole in nitric acid, q. s.; to this solution add as much sulphate of sodium as the bone ash used, and distil the whole to recover the nitric acid; the residuum is treated with water, and the resulting solution filtered, evaporated, and crystallised.

Prop., &c. It forms very beautiful oblique rhomic prisms, of the formulæ $Na_2H,PO_4, 12H_2O$, which effloresce in the air, dissolve in about 4 parts of cold water and in 2 parts at 212° Fahr., and fuse when heated. As a medicine, it is mildly aperient, in doses of ½ to 1 oz., or even more; and antacid in doses of 20 to 30 grs., frequently repeated. It has a purely saline taste, resembling that of culinary salt, and is commonly taken in broth or soup.

Sodium, Stan'nate of. Na_2SnO_3. *Prep.* (Greenwood & Co.) Caustic soda, 22 lbs., is heated to low redness in an iron crucible, when nitrate of sodium, 8 lbs., and common salt, 4 lbs., are added; when the mixture is at a "fluxing heat," 10 lbs. of feathered block tin is stirred in with an iron rod, both the stirring and heat being continued until the mass becomes red hot and "pasty," and ammoniacal fumes are given off. The product may be purified by solution and crystallisation. Patented. (See *below.*)

Sodium, Stan'nite of. *Prep.* (Greenwood & Co.) From caustic soda, 13½ lbs.; feathered block tin and common salt, of each, 4 lbs.; as the last. Patented. Both the above are used to prepare tin mordants (about 12 oz. to water, 1 gal.). The stannate and stannite of potassium are prepared in a similar manner.

Sodium, Sul'phate of. $Na_2SO_4 . 10Aq$. *Syn.* GLAUBER'S SALT; SODÆ SULPHAS (B. P., Ph. L. E. & D.), SAL CATHARTICUS GLAUBERI†, L. This is obtained as a secondary product in various chemical processes; but it may be easily formed directly from its constituents.

Prop., &c. It forms transparent, six-sided, irregular, channelled prisms, with dihedral summits, of the formulæ $Na_2SO_4 10H_2O$, which effloresce in the air, and fall to an opaque white powder; soluble in about 3 parts of water at 60°, and in considerably less at 100°

Fahr., but at a higher temperature its solubility rapidly lessens; insoluble in alcohol; fuses when heated. It is seldom wilfully adulterated. When pure, the solution is neutral to test paper; nitrate of silver throws down scarcely anything from a dilute solution; nitrate of baryta more, which is not dissolved by nitric acid. It loses 55·5% of its weight by a strong heat.

Uses. It is purgative, but, being extremely bitter-tasted, is now less frequently used than formerly. Its nauseous flavour is said to be covered by lemon juice.—*Dose.* ¼ to 1 oz. The dried salt (SODÆ SULPHAS EXSICCATA) is twice as strong. LYMINGTON GLAUBER'S SALT is a mixture of the sulphates of soda and potassa obtained from the mother-liquor of sea-salt.

Sodium, Sul'phide of. *Prep.* (P. Cod.) Saturate a solution of caustic soda (sp. gr. 1·200) with sulphuretted hydrogen, closely cover up the vessel, and set it aside that crystals may form; drain, press them in bibulous paper, and at once preserve them in a well-closed bottle. *Used* to make mineral waters, and in certain skin diseases.

The anhydrous sulphides resembles closely and are prepared in the same manner as the potassium sulphides.

Sodium, Tartrate of, and Potassium. $KNaC_4H_4O_6 . 4Aq$. *Syn.* TARTRATE OF POTASSA AND SODA, ROCHELLE SALT, SEIGNETTE'S S., TARTARISED SODA†; SODÆ TARTARATA (B. P.), SODÆ POTASSIO-TARTRAS (Ph. L.), SODÆ ET POTASSÆ TARTRAS (Ph. E. & D.), SODA TARTARIZATA†, L. *Prep.* (Ph. L. 1836.) Take of carbonate of sodium, 12 oz.; boiling water, 2 quarts; dissolve, and add, gradually, of powdered bitartrate of potassium, 16 oz. (or q. s.); strain, evaporate to a pellicle, and set it aside to crystallise; dry the resulting crystals, and evaporate the mother-liquor that it may yield more of them. The formulæ of the other Colleges are nearly similar.

Prop., &c. Large, transparent, hard, right rhombic prisms, often occurring in halves; slightly efflorescent; soluble in 5 parts of water at 60° Fahr. Its "solution neither changes the colour of litmus nor of turmeric. On the addition of sulphuric acid, bitartrate of potassium is thrown down; on adding either nitrate of silver or chloride of barium nothing is thrown down, or only what is redissolved by the addition of water." (Ph. L.) By heat it yields a mixture of the pure carbonates of potassium and sodium.

Potassio-tartrate of sodium is a mild and cooling laxative.—*Dose.* ¼ to 1 oz., largely diluted with water. It forms the basis of the popular aperient called SEIDLITZ POWDERS.

Sodium, Vale"rianate of. $NaC_5H_9O_2$. *Syn.* SODÆ VALERIANAS (Ph. D.), L. *Prep.* (Ph. D.) Dilute oil of vitriol, 6½ fl. oz., with water, ½ pint; then dissolve of powdered bichromate of potassium, 9 oz., with the aid of heat, in water, 3½ pints; when both solutions have cooled, put them into a matrass, and having added of fusel oil (alcohol amylicum—Ph. D.), 4 fl. oz., shake them together repeatedly until the temperature, which first rises to 150°, has fallen to 80° or 90° Fahr.; a condenser being connected, next apply heat so as to distil over about 4 pints of liquid; saturate this exactly with a pint, or q. s., of solution of caustic soda, separate the liquid from the oil which floats upon the surface, and evaporate it until the residual salt is partially liquefied; the heat being now withdrawn, and the salt concreted, this last, whilst still warm, is to be divided into fragments, and preserved in well-stopped bottles.

Obs. This salt is intended to be used in the preparation of the VALERIANATES OF IRON, QUININE, and ZINC.

SOILS. These are classified by agriculturists according to their chief ingredients; as loamy, clayey, sandy, chalky, and peaty soils. Of these the first is the best for most purposes, but the others may be improved by the addition of the mineral constituents of which they are deficient. Sand and lime or chalk are the proper additions to clayey soils, and clay, gypsum, or loam, to sandy and gravelly ones. Clayey soils are expensive to bring into a fertile state; but when this is once effected, and they are well manured, they yield immense crops of wheat, oats, beans, clover, and most fruits and flowers of the rosaceous kinds.

The fertilisation of soils is suggested partly by chemical analysis, practical experience, and geological observations. In cases where a barren soil is examined with a view to its improvement, it is, when possible, compared with an extremely fertile soil in the same neighbourhood, and in a similar situation; the difference given by their analyses indicates the nature of the manure required, and the most judicious methods of cultivation; and thus a plan of improvement is suggested, founded upon scientific principles.

The analysis of soils may be briefly and generally described as follows:—

1. The general character of the soil, as loamy, sandy, stoney, rather stoney, &c., being noted, 3 or 4 lbs. of it, fairly selected as an average specimen, may be taken during a period of ordinary dry weather. From this, after crushing or bruising the lumps with a piece of wood, all stones of a larger size than that of a filbert may be picked out, and their proportion to the whole quantity duly registered.

2. 1000 grs. of the remainder may be next dried by the heat of boiling water, until the mass ceases to lose weight; and, afterwards, exposed to a moist atmosphere for some time. The loss of weight in the first case, and the increase of weight in the second, indicate the absorbent powers of the soil.

3. The matter from No. 2, freed from siliceous stones by garbling, may be gradually heated to dull redness in a shallow open vessel,

avoiding waste from decrepitation, &c. The loss of weight, divided by 10, gives the percentage quantity of vegetable or organic matter present (nearly).

4. Another 1000 grs. (see No. 1) may be next washed with successive portions of cold water as long as anything is removed. The residuum, after being dried, indicates the proportion of sand and gravel (nearly).

5. Another portion of the soil (100, 200, or more grs., according to its character) is tested in the manner described under CARBONATE and ALKALIMETRY. The loss of weight in carbonic acid indicates the quantity of carbonate of lime present in the sample examined; 22 grs. of the former being equal to 50 grs. of the latter.

6. Another like portion of the soil may be gently boiled for 4 or 5 hours, along with dilute hydrochloric acid, in a flask furnished with a long glass tube passing through the cork, to prevent loss (see ETHER); after that time the whole must be thrown upon a filter, and what refuses to pass through (silica) washed with distilled water, dried, ignited, and weighed.

7. The filtrate and washings from No. 6 are next successively treated for alumina (pure clay), lime, phosphate of lime, phosphoric acid, oxide of iron, alkalies (potassa or soda), ammonia (both ready formed and latent), &c. &c., in the manner noticed under GLASS, GUANO, and the names of the respective substances referred to. See AGRICULTURE, MANURES, &c.

SOL'ANINE. *Syn.* SOLANIA, SOLANINA, L. A peculiar basic substance, obtained from the leaves and stem of *Solanum Dulcamara*, or *bitter-sweet*, and other species of the *Solanaceæ*.

SOL'DERING. The union of metallic surfaces by means of a more fusible metal fluxed between them. The method of autogenous soldering, invented by M. De Richmont, is an exception to this definition. In all cases the surfaces must be perfectly clean, and in absolute contact, and the air must be excluded, to prevent oxidation. For this last purpose the brazier and silversmith use powdered borax made into a paste with water; the coppersmith, powdered sal ammoniac; and the tinman, powdered resin. Tin-foil applied between the joints of fine brass work, first wetted with a strong solution of sal ammoniac, makes an excellent juncture, care being taken to avoid too much heat. See SOLUTION (Soldering), and *below*.

SOL'DERS. *Prep.* 1. (For copper, iron, and dark brass.) From copper and zinc, equal parts; melted together. For pale brass more zinc must be used.

2. (Fine solder.) From tin, 2 parts; lead, 1 part. Melts at 350° Fahr. *Used* to tin and solder copper, tin plates, &c.

3. (For German silver.) From German silver, 5 parts; zinc, 4 parts; melted together, run into thin flakes, and then powdered. Also as No. 7.

4. (Glazier's.) From lead, 3 parts; tin, 1 part. Melts at 500° Fahr.

5. (For gold.) Gold, 12 pennyweights; copper, 4 do.; silver, 2 do.

6. (For lead and zinc.) From lead, 2 parts; tin, 1 part.

7. (For pewter, Britannia metal, &c.) From tin, 10 parts; lead, 5 parts; bismuth, 1 to 3 parts.

8. (For silver.) From fine brass, 6 parts; silver, 5 parts; zinc, 2 parts.

9. (For tin plate.) From tin, 2 parts; lead, 1 part. The addition of bismuth, 1 part, renders it fit for pewter.

SOLE. The *Solea vulgaris*, a well-known fish. It is perhaps more frequently eaten than any other flat fish, and, when skilfully cooked, exceeds them all in delicacy, nutritiousness, and flavour.

SOLU'TION. *Syn.* SOLUTIO, L. Under the head of solutions (SOLUTIONES), in pharmacy, are properly included only those liquids which consist of water, or an aqueous menstruum, in which has been dissolved an appropriate quantity of any soluble substance to impart to the liquor its peculiar properties. When spirit is the menstruum, the liquid receives the name of alcoholic solution, spirit, or tincture. In the B. P. and the Ph. L. & D. aqueous solutions are named LIQUORS (LIQUORES); whilst in the Ph. E., and in the old Pharmacopœias generally, they are termed WATERS (AQUÆ).

The following list embraces all the solutions of the British pharmacopœias, with a few others likely to be useful to the reader. Some other preparations to which the name has been given will be found under LIQUORS, TINCTURES, &c.

Solution of Ac'etate of Ammo"nia. *Syn.* LIQUOR OF ACETATE OF AMMONIA, WATER OF A. OF A., MINDERERUS' SPIRIT; AMMONIÆ ACETATIS LIQUOR (B. P.), LIQUOR AMMONIÆ ACETATIS (Ph. L. & D.), AMMONIÆ ACETATIS AQUA (Ph. E.), L. *Prep.* 1. (Ph. L.) From dilute acetic acid, 1 pint; exactly neutralised by sesquicarbonate of ammonia (in coarse powder), 9 drs., or q. s. Sp. gr. 1·022.

2. (Ph. E.) Distilled vinegar (preferably from French vinegar), sp. gr. 1·005, 24 fl. oz.; carbonate (sesquicarbonate) of ammonia, 1 oz., or q. s. Sp. gr. 1·011.

3. (Ph. D.) Sesquicarbonate of ammonia, 2½ oz.; dilute acetic acid, 3 pints. Sp. gr. 1·012.

4. (B. P.) Carbonate of ammonia, 3¼, or sufficient; acetic acid (28 per cent.), 10; distilled water, 50. Dissolve the carbonate in the acid, and add the water.

Prop., &c. Free from colour and odour. It changes the colour neither of litmus nor turmeric. Sulphuretted hydrogen being dropped in, it is not discoloured, neither is anything thrown down on the addition of chloride of barium. What is precipitated by nitrate of silver is soluble in water, but especially so in nitric acid. Potassa being added, it emits ammonia; and sulphuric acid being added, it gives off acetic vapours. The fluid being evaporated, what remains is completely destroyed by heat.

Uses, &c. Solution of acetate of ammonia is a very common and excellent febrifuge and diaphoretic, and, in large doses, aperient saline liquor. Taken warm, in bed, it generally proves a powerful sudorific; and as it operates without heat, it is much used in febrile and inflammatory disorders. Its action may likewise be determined to the kidneys, by walking about in the cold air.—*Dose.* 2 to 6 drs., twice or thrice daily, either by itself or along with other medicines. *Externally,* as a discutient and refrigerant lotion; and diluted (1 oz. to 9 oz. of water), as a collyrium in chronic ophthalmia. For this last purpose it must be free from excess of ammonia.

5. (Concentrated.) Saturate acetic acid, sp. gr. 1·038, ½ gal., with carbonate of ammonia (in powder), 2½ lbs., or q. s.; carefully avoiding excess.

Obs. This article is in great demand in the wholesale drug trade, under the name of 'concentrated liquor of acetate of ammonia' (LIQ. AMMON. ACET. CONC.). It is very convenient for dispensing. 1 fl. dr. added to 7 fl. drs. of water forms the LIQUOR AMMONIÆ ACETATIS of the Ph. L.

Solution of Acetate of Lead. See SOLUTION OF DIACETATE OF LEAD.

Solution of Acetate of Morphia. *Syn.* LIQUOR MORPHIÆ ACETATIS (B. P., Ph. L. & D.), L. *Prep.* 1 (Ph. L.) Acetate of morphia, 4 drs.; acetic acid, 15 drops; distilled water, 1 pint; proof spirit, ½ pint; mix, and dissolve. 60 drops (minims) contain 1 gr. of acetate of morphia.—*Dose.* 5 to 15 or 20 drops.

2. (B. P.) Acetate of morphia, 4 grs.; diluted acetic acid, 8 minims; rectified spirit, 2 drs.; distilled water, 6 drs.; dissolve in the mixed liquids.—*Dose.* 10 to 60 minims.

3. (Ph. D.) Acetate of morphia, 82 grs.; rectified spirit, 5 fl. oz.; distilled water, 15 fl. oz. 120 drops (minims) contain 1 gr. of the acetate.—*Dose.* 10 to 45 or 50 drops, or similar to that of tincture of opium.

4. (Magendie.) Each fl. dr. contains 1¼ gr. of acetate (nearly).—*Dose.* 5 to 15 drops. Anodyne, hypnotic, and narcotic; in those cases in which opium is inadmissible. See MORPHIA.

Solution of Al′um (Compound). *Syn.* BATE'S ALUM WATER; LIQUOR ALUMINIS COMPOSITUS (Ph. L.), AQUA ALUMINOSA COMPOSITA†, L. *Prep.* (Ph. L.) Alum and sulphate of zinc, of each, 1 oz.; boiling water, 3 pints; dissolve, and filter (if necessary). Detergent and astringent. Used as a lotion for old ulcers, chilblains, excoriations, &c.; and, largely diluted with water, as an eye-wash and injection.

Solution of Ammo″nia. See LIQUOR OF AMMONIA.

Solution of Ammo″nio-ni′trate of Sil′ver. *Syn.* HUME'S TEST; SOLUTIO ARGENTI AMMONIATI (Ph. E.), L. *Prep.* (Ph. E.) Nitrate of silver (pure crystallised), 44 grs.; distilled water, 1 fl. oz.; dissolve, and add ammonia water, gradually, until the precipitate, at first thrown down, is very nearly, but not entirely, redissolved. Used as a test for arsenic.

Solution of Ammo″nio-sul′phate of Cop′per. *Syn.* LIQUOR CUPRI AMMONIO-SULPHATIS (Ph. L.), CUPRI AMMONIATI SOLUTIO (Ph. E.), C. A. AQUA, L. *Prep.* (Ph. L.) Ammonio-sulphate of copper, 1 dr.; water, 1 pint; dissolve, and filter. Stimulant and detergent. Applied to indolent ulcers, and, when largely diluted, to remove specks on the cornea; also used as a test for arsenic.

Solution for Anatom′ical Preparations, &c. *Syn.* ANTISEPTIC SOLUTION. *Prep.* 1. Nearly saturate water with sulphurous acid, and add a little creasote.

2. Dissolve chloride of tin, 4 parts, in water, 100 parts, to which 3% of hydrochloric acid has been added.

3. Dissolve corrosive sublimate, 1 part, and chloride of sodium, 3 parts, in water, 100 parts, to which 2% of hydrochloric acid has been added.

4. Mix liquor of ammonia (strong) with 3 times its weight (each) of water and rectified spirit.

5. Sal ammoniac, 1 part; water, 10 or 11 parts. For muscular parts of animals.

6. Sulphate of zinc, 1 part; water, 15 to 25 parts. For muscles, integuments, and cerebral masses.

7. (Dr. Babington.) Wood naphtha, 1 part; water, 7 parts; or wood naphtha undiluted, as an injection.

8. (Sir W. Burnett.) Concentrated solution of chloride of zinc, 1 lb.; water, 1 gal. The substances are immersed in the solution for 2 to 4 days, and then dried in the air.

9. (Gannal.) Alum and culinary salt, of each, ½ lb.; nitre, ¼ lb.; water, 1 gal.

10. (Goadsby.)—*a.* From bay salt, 2 oz.; alum, 1 oz.; bichloride of mercury, 1 gr.; water, 1 pint. For ordinary purposes.

b. To the last add of bichloride of mercury, 1 gr.; water, 1 pint. For very tender tissues, and where there is a tendency to mouldiness.

c. From bay salt, ¼ lb.; bichloride of mercury, 1 gr.; water, 1 pint. For subjects containing carbonate of lime.

d. From bay salt, ¼ lb.; arsenious acid, 10 grs.; water, 1 pint; dissolve by heat. For old preparations.

e. To the last add of bichloride of mercury, 1 gr. As the last, when there is a tendency to the softening of parts; and, diluted, for mollusca. These solutions are approved of by Prof. Owen.

11. (M. Réboulet.) Nitre, 1 part; alum, 2 parts; chloride of lime, 4 parts; water, 16

or 20 parts; to be afterwards diluted according to circumstances. For pathological specimens.

12. (Dr. Stapleton.) Alum, 2¼ oz.; nitre, 1 dr.; water, 1 quart. For pathological specimens.

13. (For FEATHERS—Beasley.) Strychnia, 16 grs.; rectified spirit, 1 pint.

Obs. These fluids are used for preserving ANATOMICAL PREPARATIONS, OBJECTS OF NATURAL HISTORY, &c., by immersing them therein, in close vessels; or, for temporary purposes, applying them by means of a brush or piece of rag. The presence of corrosive sublimate is apt to render animal substances very hard. See PUTREFACTION.

Solution, Antisep'tic. See *above*.

Solution, Arsenical. *Syn.* MINERAL SOLUTION; SOLUTIO ARSENICALIS, SOLUTIO MINERALIS, L. *Prep.* 1. (Devergie.) As SOLUTION OF ARSENITE OF POTASSA, Ph. L., but of only 1-50th the strength, and flavoured with compound spirit of balm, and coloured to a deep rose with cochineal.

2. (Pearson.) Arseniate of soda, 4 grs.; water, 4 fl. oz.; dissolve.—*Dose.* 10 to 30 drops during the day. (See *below*.)

Solution of Arse''nious Acid. See AGUE DROPS and ARSENIOUS ACID.

Solution of Ar'senite of Potas'sa. *Syn.* FOWLER'S MINERAL SOLUTION; LIQUOR POTASSÆ ARSENITIS (Ph. L.), LIQUOR ARSENICALIS (B. P., Ph. E. D. & U. S.), L. *Prep.* (B. P., Ph. L. & E.) Arsenious acid, coarsely powdered, and carbonate of potassa, of each, 80 grs.; distilled water, 1 pint; boil until dissolved, and add, to the cold solution, compound tincture of lavender, 5 fl. drs.; water, q. s. to make the whole exactly measure a pint. Tonic, antiperiodic, and alterative.—*Dose.* 4 or 5 drops, gradually and cautiously increased; in agues and various scaly skin diseases. It is preferably taken soon after a meal. See ARSENIOUS ACID, &c.

Solution of Atropia. *Syn.* LIQUOR ATROPIÆ (B. P.). *Prep.* Atropia, 4 grs.; rectified spirit, 1 dr.; dissolve and add water, 7 drs.; mix.—*Dose.* 1 minim.

Solution of Bismuth and Citrate of Ammonia. *Syn.* LIQUOR BISMUTHI ET AMMONIÆ CITRATIS (B. P.). Purified bismuth, 1; nitric acid, 2; citric acid, 2; solution of ammonia, a sufficiency; mix the nitric acid with an ounce of distilled water, and add the bismuth in successive portions. When effervescence has ceased, apply for ten minutes a heat approaching that of ebullition, and decant the solution from any insoluble matter. Evaporate the solution until it is reduced to 2, then add the citric acid previously dissolved in 4 of distilled water, and afterwards the solution of ammonia in small quantities at a time, until the precipitate formed is redissolved, and the solution is neutral or slightly alkaline to test paper; dilute with distilled water to the volume of 20.—*Dose.* ½ to 1 dr.

Solution, Brandish's. See SOLUTION OF POTASSA.

Solution, Burnett's. A solution of chloride of zinc. See SOLUTION FOR ANATOMICAL PREPARATIONS (*above*), also DISINFECTING COMPOUNDS.

Solution of Car'bonate of Ammo''nia. *Syn.* SOLUTION OF SESQUICARBONATE OF AMMONIA, CARBONATE OF AMMONIA WATER; LIQUOR AMMONIÆ SESQUICARBONATIS (Ph. L.), AQUA AMMONIÆ CARBONATIS (Ph. E.). *Prep.* (Ph. L. & E.) Sesquicarbonate of ammonia, 4 oz.; distilled water, 1 pint; dissolve. Stimulant and antacid.—*Dose.* ½ to 1 fl. dr., in water.

Solution of Carbonate of Magnesia. *Syn.* LIQUOR MAGNESIÆ CARBONATIS (B. P.). Prepared by impregnating water with carbonic anhydride under pressure, in which freshly precipitated carbonate of magnesia is suspended. *Dose.* 1 to 2 oz.

Solution of Carbonate of Potas'sa. *Syn.* OIL OF TARTAR†, WATER OF SUBCARBONATE OF POTASH†; LIQUOR POTASSÆ CARBONATIS Ph. L. & D.), L. P. SUBCARBONATIS†, L. *Prep.* (Ph. L.) Carbonate of potassa, 20 oz. (10 oz.—Ph. D.); water, 1 pint; dissolve and filter (or decant). Sp. gr.—Ph. L., 1·473; Ph. D., 1·310. *Dose.* 10 drops to 1 dr., as an antacid, &c.

Solution of Carbonate of So'da. *Syn.* SUBCARBONATE OF SODA WATER†; SODÆ CARBONATIS LIQUOR (Ph. D.), L. *Prep.* (Ph. D.) Carbonate of soda (in crystals) 1½ oz.; distilled water, 1 pint. Sp. gr. 1·026.—*Dose.* ½ to 1½ fl. oz., as an antacid; in heartburn, dyspepsia, &c.

Solution of Chloride of Antimony. *Syn.* ANTIMONII CHLORIDI LIQUOR (B. P.). *Prep.* Dissolve black sulphide of antimony in boiling hydrochloric acid. Used as an escharotic, and in the preparation of oxide of antimony.

Solution of Chlo''ride of Ar'senic. *Syn.* LIQUOR ARSENICI HYDROCHLORICUS (B. P.), LIQUOR ARSENICI CHLORIDI (Ph. L.), L. *Prep.* 1. (Ph. L.) Arsenious acid (in coarse powder), ½ dr.; hydrochloric acid, 1½ fl. dr.; distilled water, 1 fl. oz.; boil until the solution of the arsenious acid is complete, and, when cold, add enough distilled water to make the whole exactly measure a pint.—*Dose.* 4 to 5 drops.

2. (B. P.) Arsenious acid, 80 grs.; hydrochloric acid, 2 drs.; distilled water, 20 oz.; boil the two acids with 4 oz. of the water until a solution is effected, then add sufficient distilled water to make up 20 oz.—*Dose.* 2 to 8 minims.

Solution of Chloride of Ba''rium. *Syn.* SOLUTION OF MURIATE OF BARYTA†; LIQUOR BARII CHLORIDI (Ph. L. & D.), SOLUTIO BARYTÆ MURIATIS (Ph. E.), L. *Prep.* (Ph. L. & E.) Dissolve chloride of barium, 1 dr. (1 oz.—Ph. D.), in water, 1 fl. oz. (8 oz. (Ph. D.). and filter the solution. Sp. gr. (Ph. D.) 1·088.—*Dose.* 5 drops, gradually increased to 10 or 12, twice or thrice daily; in scrofula, scirrhous affections, and worms; ex-

ternally, largely diluted, as a lotion in scrofulous ophthalmia.

Solution of Chloride of Cal'cium. *Syn.* SOLUTION OF MURIATE OF LIME†; CALCII CHLORIDI LIQUOR (Ph. D.), CALCIS MURIATIS SOLUTIO (Ph. E.). *Prep.* 1. (Ph. L. 1836.) Fused chloride of calcium, 4 oz. (crystals, 8 oz. —Ph. E.); water, 12 fl. oz.; dissolve, and filter.

2. (Ph. D.) Fused chloride of calcium, 3 oz.; water, 12 oz. Sp. gr. 1·225.—*Dose.* 10 drops to 1 dr., or more; in scrofulous and glandular diseases, &c.

Solution of Chloride of Zinc. *Syn.* LIQUOR ZINCI CHLORIDI (B. P.). *Prep.* Granulated zinc, 8; hydrochloric acid, 22; solution of chlorine, q. s.; carbonate of zinc, ¼; distilled water, 10. Mix the acid and water in a porcelain dish, add the zinc, and apply a gentle heat to promote the action until gas is no longer evolved; boil for half an hour, supplying the water lost by evaporation, and allow the product to cool. Filter it into a bottle, and add solution of chlorine by degrees, with frequent agitation, until a brown sediment appears. Filter the liquid into a porcelain basin, and evaporate until it is reduced to the bulk of 20.

Solution of Chlo''rinated Lime. *Syn.* BLEACHING LIQUID, SOLUTION OF CHLORIDE OF LIME‡, L. OF HYPOCHLORITE OF LIME; SOLUTIO CALCIS HYPOCHLORIS, S. CALCIS CHLORIDI, CALCIS CHLORINATÆ LIQUOR (Ph. D.), L. *Prep.* 1. (Ph. D.) Chlorinated lime ('chloride of lime'), ½ lb.; water, ½ gal.; triturate them together, then transfer the mixture to a stoppered bottle, and shake it repeatedly for the space of 3 hours; lastly, filter through calico, and preserve it in a well-stopped bottle.

2. Chloride of lime (dry and good, and rubbed to fine powder), 9½ lbs.; tepid water, 6 galls.; mix in a stoneware bottle capable of holding 8 galls., agitate frequently for a day or two, and, after 2 or 3 days' repose, decant the clear portion, and keep it in well-corked bottles, in a cool situation. If filtered, it should be done as rapidly as possible, and only through coarsely powdered glass in a covered vessel.

Obs. The last is the usual strength sold in trade, under various attractive names, to give it importance. It is used as a disinfectant, bleacher, and fumigation; and, diluted with water, as a lotion, injection, or collyrium, in several diseases. See HYPOCHLORITE OF CALCIUM.

Solution of Chlorinated Potas'sa. *Syn.* SOLUTION OF CHLORIDE OF POTASH‡, S. OF HYPOCHLORITE OF POTASSA, JAVELLE'S BLEACHING LIQUID; SOLUTIO POTASSÆ HYPOCHLORIS, LIQUOR POTASSÆ CHLORIDI, L. POTASSÆ CHLORINATÆ, L.; EAU DE JAVELLE, Fr. *Prep.* 1. Dissolve carbonate of potassa, 1 part, in water, 10 parts, and pass chlorine gas through the solution to saturation.

2. Chloride of lime (dry and good), 1 part; water, 15 parts; agitate them together for an hour; next dissolve of carbonate of potassa, 2 oz., in water, ¼ pint; mix the two solutions, and after a time either decant or filter. *Uses, &c.*, as the last.

Solution of Chlorinated Soda. *Syn.* SOLUTION OF CHLORIDE OF SODA‡, S. OF HYPOCHLORITE OF SODA, LABARRAQUE'S DISINFECTING LIQUID; SOLUTIO SODÆ HYPOCHLORIS, HYPOCHLORIS SODICUS AQUA SOLUTUS (P. Cod.), LIQUOR SODÆ CHLORINATÆ (Ph. L. & D.), L. *Prep.* 1. (Ph. L.), Carbonate of soda (in crystals), 1 lb.; water, 1 quart; dissolve, and pass through the solution the chlorine evolved from a mixture of common salt, 4 oz.; binoxide of manganese, 3 oz.; sulphuric acid, 2½ fl. oz. (4 oz.—Ph. L. 1836); diluted with water, 3 fl. oz.; placed in a retort, heat being applied to promote the action, and the gas being purified by passing through 5 fl. oz. of water before it enters the alkaline solution.

2. (Ph. D.) Chlorinated lime, ½ lb., and water, 3 pints, are triturated together in a marble mortar, after which the mixture is transferred to a stoppered bottle, agitated frequently during three hours, and then filtered through calico; in the mean time carbonate of soda (cryst.), 7 oz., is dissolved in water, 1 pint; the two solutions are next mixed, and, after agitation for about 10 minutes, the whole is filtered as before. The filtrate is to be preserved in a well-stopped bottle.

Obs. This solution is used as an antiseptic, disinfectant, and bleaching liquid.—*Dose.* 20 to 30 drops, in any bland fluid, in scarlet fever, sore throat, &c; it is also made into a lotion, gargle, injection, and eye-water. Meat in a nearly putrid state, unfit for food, is immediately restored by washing or immersion in this liquid.

Solution of Chlo''rine. *Syn.* CHLORINE WATER; SOLUTIO CHLORINII, LIQUOR CHLORINI (Ph. L. & D.), CHLORINEI AQUA (Ph. E.), L. *Prep.* 1. (Ph. L.) On binoxide of manganese (in powder), 2 drs., placed in a retort, pour hydrochloric acid, 1 fl. oz., and pass the chlorine into distilled water, ½ pint, until it ceases to be evolved.

2. (Ph. E.) Muriate of soda (common salt), 60 grs.; red oxide of lead, 350 grs.; triturate them together, and put them into 8 fl. oz. of distilled water, contained in a stoppered bottle; then add of sulphuric acid, 2 fl. drs.; and having replaced the stopper, agitate the whole, occasionally, until the oxide of lead turns white; lastly, after subsidence, pour off the clear liquid into another stoppered bottle.

3. (Ph. D.) Introduce into a gas bottle peroxide of manganese (in fine powder), ¼ oz.; add of hydrochloric acid, 3 fl. oz. (diluted with), water, 2 fl. oz.; apply a gentle heat, and cause the evolved gas to pass through water, 2 fl. oz.; and then into a 3-pint bottle containing distilled water, 20 fl. oz., and whose mouth is

loosely plugged with tow; when the air has been entirely displaced by the chlorine, cork the bottle loosely, and shake it until the chlorine is absorbed; it should now be transferred to a pint stoppered bottle, and preserved in a dark and cool place.

Prop., *&c.* Irritant and acrid, but, when largely diluted, stimulant and antiseptic.—*Dose.* ½ to 2 fl. dr., in ½ pint of water, sweetened with a little sugar, in divided doses, during the day; in scarlatina, malignant sore throat, &c. On the large scale, liquid chlorine may be procured by passing the gas obtained by any of the methods named under CHLORINE, into water, until it will absorb no more.

Solution of Cit′rate of Ammo″nia. *Syn.* LIQUOR AMMONIÆ CITRATIS (B. P., Ph. L.), L. *Prep.* (Ph. L.) Dissolve citric acid, 3 oz., in distilled water, 1 pint; and to the solution add of sesquicarbonate of ammonia (in powder), 2½ oz., or q. s. to exactly neutralise the liquor —*Dose.* 2 to 6 fl. drs.

Solution of Citrate of Magne′sia. *Syn.* SOLUTIO MAGNESIÆ CITRATIS, L. See *page* 729.

Solution of Citrate of Morphia. *Syn.* LIQUOR MORPHIÆ CITRATIS, SOLUTIO M. C., L. *Prep.* (Magendie.) Pure morphia, 13 grs.; citric acid, 8 or 10 grs.; water, 1 fl. oz.; tincture of cochineal, 2 fl. drs.—*Dose.* 3 to 12 drops.

Solution of Copai′ba. See SPECIFIC SOLUTION.

Solution of Corro′sive Sub′limate. *Syn.* SOLUTION OF CHLORIDE OF MERCURY; LIQUOR HYDRARGYRI BICHLORIDI† (Ph. L.). *Prep.* 1. (Ph. L.) Corrosive sublimate and sal ammoniac, of each, 10 grs.; water, 1 pint; dissolve.—*Dose.* As an alterative, 10 to 30 drops; as an antisyphilitic, ½ to 2 fl. drs., in simple or sweetened water. It must not be allowed to touch anything metallic. It also forms a most useful lotion in various skin diseases.

2. See MERCURIAL LOTIONS.

Solution of Diac′etate of Lead. See SOLUTION OF SUBACETATE OF LEAD.

Solution, Donovan's. See SOLUTION OF HYDRIODATE OF ARSENIC AND MERCURY (*below*).

Solution, Escharotic (Freyburg's). *Syn.* SOLUTIO ESCHAROTICA, L. *Prep.* From camphor, 30 grs.; corrosive sublimate, 60 to 100 grs.; rectified spirit, 1 fl. oz.; dissolve. In syphilitic vegetations, and specially condylomes. It is spread over the diseased surface, either at once or after the application of a ligature.

Solution of Flints. *Syn.* LIQUOR OF FLINTS; LIQUAMEN SILICUM, LIQUOR POTASSÆ SILICATIS, L. *Prep.* 1. Soluble glass dissolved in water.

2. (Bate.) Powdered quartz, 1 part; dry carbonate of potash, 2 parts (3 parts—Turner); triturate them together, fuse the mixture in a Hessian crucible, and allow the resulting glass to deliquesce by exposure in a damp situation.—*Dose.* 5 or 6 to 30 drops; in gouty concretions, stone, &c. "It resolves the stone, and opens obstructions." See SOLUBLE GLASS.

Solution, Gannal's. See *page* 1057.

Solution, Goadsby's. See *page* 1057.

Solution, Goulard's. See SOLUTION OF SUBACETATE OF LEAD.

Solution, Hahnemann's Prophylac′tic. *Syn.* LIQUOR BELLADONNÆ, SOLUTIO PROPHYLACTICA, L. *Prep.* From extract of belladonna (alcoholic), 3 grs.; distilled water, 6 fl. drs.; rectified spirit, 2 fl. drs.; dissolve. *Used* against scarlet fever.—*Dose.* 2 or 3 drops for a child under 12 months; and an additional drop for every year above that age to maturity.

Solution of Hydri′odate of Ar′senic and Mer′cury. *Syn.* DONOVAN'S SOLUTION; SOLUTIO ARSENICI ET HYDRARGYRI IODIDI, ARSENICI ET HYDRARGYRI HYDRIODATIS LIQUOR (Ph. D.), L. *Prep.* 1. (Donovan.) Triturate metallic arsenic, 6·08 grs., mercury, 15·38 grs., and iodine, 50 grs., with alcohol, 1 fl. dr., until dry; to this add, gradually, of distilled water, 8 fl. oz., and again well triturate; next put the whole into a flask, add of hydriodic acid, ½ fl. dr., and boil for a few minutes; lastly, when cold, add distilled water, q. s. to make the whole measure exactly 8 fl. oz.

2. (Ph. D.) Pure arsenic (in fine powder), 6 grs.; pure mercury, 16 grs.; pure iodine, 50½ grs.; alcohol, ½ fl. dr.; triturate as before, add, gradually, of water, 8 fl. oz.; heat the mixture until it begins to boil, and, afterwards, make up the cold and filtered solution to exactly 8 fl. oz. 6 fl. dr.

3. (Wholesale.) From metallic arsenic, 61 grs.; iodine, 500 grs.; mercury, 154 grs.; rectified spirit, 1½ fl. oz.; distilled water, 2 quarts; hydriodic acid, 5 fl. drs.; as No. 1; the product being made up with distilled water so as to measure exactly 4 pints, or 80 fl. oz., or to weigh 5 lbs. 1¼ oz. (av.), when cold.

Obs. Great care must be taken that the whole of the arsenic be dissolved, which can only be affected by the most careful trituration. Soubeiran recommends the employment of 1 part, each, of the respective iodides, with 98 parts of water, as furnishing a simpler and equally effective product, proportions which are almost exactly those employed by Mr. Donovan.—*Dose.* 10 to 30 drops, twice or thrice a day, preferable soon after a meal; in lepra, psoriasis, lupus, and several other scaly skin diseases. It is a most valuable medicine in these affections.

Solution of Hyrochlo″rate of Mor′phia. *Syn.* SOLUTION OF MURIATE OF MORPHIA; LIQUOR MORPHIÆ HYDROCHLORATIS (Ph. L.), SOLUTIO MORPHIÆ MURIATIS (Ph. E.), MORPHIÆ MURIATIS LIQUOR (Ph. D.), L. *Prep.* 1. (Ph. L.) Hydrochlorate of morphia, 4 drs.; proof spirit, ½ pint; distilled water, 1 pint; dissolve by the aid of a gentle heat. 60 drops (minims) of this solution contain 1 gr. of hydrochlorate of morphia.—*Dose.* 5 to 15 or 20 drops.

2. (Ph. E. & D.) Muriate of morphia, 90 grs.; rectified spirit, 5 fl. oz.; distilled water,

15 fl. oz. 107 drops (minims) contain 1 gr. of the hydrochlorate.—*Dose.* 10 to 30 or 40 drops, or nearly as laudanum.

3. (Apothecaries' Hall.) Muriate of morphia, 16 grs.; rectified spirit, 1 fl. dr.; water, 1 fl. oz.; 30 drops (minims) contain 1 gr.—*Dose.* 3 to 10 drops. See SOLUTION OF ACETATE OF MORPHIA, &c.

Solution of Hypochlo″rite of Lime. Solution of chlorinated lime.

Solution of I′odide of Ar′senic. *Syn.* LIQUOR ARSENICI PERIODIDI, L. *Prep.* (Wackenroder.) Each drachm contains ⅛ gr. of teriodide of arsenic; equivalent to 1/48 gr. of metallic arsenic, and 1/10 gr. (nearly) of iodine.

Solution of Iodide of Mer′cury and Potas′sium. *Syn.* LIQUOR IODOHYDRARGYRATIS POTASSII IODIDI, L. *Prep.* (Dr. Channing.) Iodide of potassium, 3½ grs.; biniodide of mercury, 4½ grs.; distilled water, 1 fl. oz.; dissolve.—*Dose.* 2 to 5 or 6 drops, three times a day, much diluted; in dyspepsia, indurations, enlargement of the spleen, dropsy, &c.

Solution of Iodide of Potas′sium (Compound). *Syn.* IODURETTED WATER, COMPOUND SOLUTION OF IODINE; LIQUOR POTASSII IODIDI COMPOSITUS (Ph. L. & D.), LIQUOR IODINEI COMPOSITUS (Ph. E.), L. *Prep.* 1. (Ph. L. & D.) Iodide of potassium, 10 grs.; iodine, 5 grs.; water, 1 pint; dissolve.—*Dose.* 1 to 6 drs.; in the usual cases where iodine is employed.

2. (Ph. E.) Iodide of potassium, 1 oz.; iodine, 2 drs.; water, 16 fl. oz. This is 30 times as strong as the preceding.—*Dose.* 5 to 20 drops.

Solution of I′odine. See *above.*

Solution of I′ron (Alkaline). *Syn.* LIQUOR FERRI ALKALINI, L. *Prep.* (Ph. L. 1824.) Iron filings, 2½ drs.; nitric acid, 2 fl. oz.; water, 6 fl. oz.; dissolve, decant, gradually add of solution of carbonate of potash, 6 fl. oz., and in 6 hours decant the clear portion. This was intended as an imitation of Stahl's Tinctura Martis Alkalina. It is tonic, emmenagogue, &c.—*Dose.* 20 to 60 drops.

Solution, Javelle's. See *page* 1059.

Solution, Labarraque's. See *page* 1059.

Solution of Lime. *Syn.* LIME WATER; SOLUTIO CALCIS HYDRATIS, LIQUOR CALCIS (Ph. L. & D.), AQUA CALCIS (Ph. E.), L. *Prep.* (Ph. L.) Upon the lime, ½ lb., first slaked (by sprinkling it) with a little of the water, pour the remainder of water, 12 pints, and shake them well together (for 5 minutes—Ph. D.); immediately cover the vessel, and set it aside for three hours; then keep the solution with the remaining lime (equally divided) in stoppered glass vessels, and, when it is to be used, decant the required portion from the clear solution (replacing it with more water, and agitating briskly, as before—Ph. E.).

Obs. Cold water dissolves more lime than hot water. 1 pint of water at 32° Fahr. dissolves 13¼ grs., at 60° it dissolves 11⅓ grs., but at 212° only 6½ grs. (Phillips.)

Uses, &c. Lime water is antacid, astringent, antilithic, tonic, and vermifuge.—*Dose.* A wine-glassful, or more, 2 or 3 times a day, in milk or broth; in dyspepsia, diarrhœa, calculous affections, &c.; and, externally, as a detersive and discutient lotion.

Solution of Lime (Saccharated). *Syn.* LIQUOR CALCIS SACCHARATUS. *Prep.* Slaked lime, 1; refined sugar (in powder), 2; distilled water, 20; digest for some hours and strain.—*Dose.* 15 to 60 minims in milk.

Solution, Mackenzie's. *Prep.* From nitrate of silver, 20 grs., dissolved in distilled water, 1 fl. oz. *Used* to wash the throat and fauces, and to sponge the trachea, in affections of those parts.

Solution of Magne′sia. *Syn.* AERATED MAGNESIA WATER, CARBONATED M. W., FLUID MAGNESIA, CONDENSED SOLUTION OF M., CONCENTRATED S. OF M.; LIQUOR MAGNESIÆ CARBONATIS, AQUA M. C., L.; EAU MAGNESIENNE, Fr. *Prep.* (Dinneford's.) Water and Howard's heavy carbonate of magnesia, in the proportion of 17½ grs. of the latter to every fl. oz. of the former, are introduced into a cylindrical tinned copper vessel, and carbonic acid, generated by the action of sulphuric acid on whiting, is forced into it by steam power, for 5½ hours, during the whole of which time the cylinder is kept in motion. Sir J. Murray's is similar. The Paris Codex orders recently precipitated carbonate of magnesia to be used while still moist. Antacid and laxative. See FLUID MAGNESIA.

Solution, Min′eral. See SOLUTION OF ARSENITE OF POTASSA.

Solution of Mor′phia. See SOLUTIONS OF ACETATE, HYDROCHLORATE, and SULPHATE.

Solution of Nitrate of Mercury (Acid). *Syn.* LIQUOR HYDRARGYRI NITRATIS ACIDUS (B. P.). *Prep.* Mercury, 4; nitric acid, 5; distilled water, 1½; mix the nitric acid with the water in a flask, and dissolve the mercury in the mixture without the application of heat. Boil gently for 15 minutes, cool, and preserve the solution in a stoppered bottle. *Used* alone, as a caustic; 1 to 2 minims to 1 oz. water, as a gargle; and 1 minim to 2 oz. water, as an injection in gonorrhœa.

Solution of Nitrate of Sil′ver. *Syn.* LIQUOR ARGENTI NITRATIS (Ph. L.), SOLUTIO A. N. (Ph. E.), L. *Prep.* (P. L.) Nitrate of silver (cryst.), 1 dr. (40 grs.—Ph. E.); distilled water, 1 fl. oz. (1600 grs.—Ph. E.); dissolve. *Used* as an escharotic, &c. It should be kept from the light. See LOTION, SILVER, &c.

Solution of O′pium (Sed′ative). See LIQUOR.

Solution of Oxysulphate of Iron‡. *Syn.* LIQUOR FERRI OXYSULPHATIS, L. *Prep.* From sulphate of iron (in powder) and nitric acid, of each, 3 drs.; triturated together for 15 minutes, and then dissolved in distilled water, 1½ fl. oz. —*Dose.* 5 or 6 to 12 drops.

Solution of Permanganate of Potassa. *Syn.* LIQUOR POTASSÆ PERMANGANATIS (B. P.). *Prep.* Permanganate of potassa, 4 grs.; distilled water, 1 oz.; dissolve. Diluted with

40 parts of water, it is used as a gargle or as a cleansing wash for diseased surface.—*Dose.* 2 to 4 drs.

Solution of Perchloride of Iron. *Syn.* LIQUOR FERRI PERCHLORIDI (B. P.). *Prep.* Stronger solution of perchloride of iron (see *below*), 1; distilled water, 3.—*Dose.* 10 to 30 minims.

Solution of Perchloride of Iron (Stronger). *Syn.* LIQUOR FERRI PERCHLORIDI FORTIOR (B. P.). *Prep.* Iron wire, 2 oz.; hydrochloric acid, 12 oz.; nitric acid, 9 drs.; distilled water, 8 grs. Mix 8 of the hydrochloric acid with the water, and pour the mixture on the iron wire, applying a gentle heat, so that the whole of the metal may be dissolved; filter the solution, and add to it the remainder of the hydrochloric and nitric acids; heat the mixture briskly, until, on the sudden evolution of red fumes, the liquid becomes of an orange-brown colour, then evaporate by the heat of a water bath until it is reduced to 10 fl. oz. *Used* as an application to diphtheritic patches, for injecting nævi, as a powerful styptic, and in the preparation of SOLUTION OF PERCHLORIDE OF IRON. (See *above*.)

Solution of Perni'trate of Iron. *Syn.* SOLUTION OF PERSESQUINITRATE OF IRON; FERRI PERNITRAS LIQUOR (Ph. D.), SOLUTIO PERSESQUINITRAS FERRI (Kerr), L. *Prep.* (Ph. D.). Take of pure nitric acid, 3 fl. oz.; water, 16 fl. oz.; mix, add fine iron wire, 1 oz.; dissolve, and to the clear solution add as much water as will make the whole measure 1¼ pint. Sp. gr. 1·107.—*Dose.* 5 or 6 to 30 drops, or more; in passive hæmorrhages, mucous discharges, chronic diarrhœa with prostration, &c.

Solution of Persulphate of Iron. *Syn.* LIQUOR FERRI PERSULPHATIS. *Prep.* Sulphate of iron, 8; sulphuric acid, ¾; nitric acid, ¾; distilled water, 12. Add the sulphuric acid to 10 of the water, and dissolve the sulphate of iron in the mixture with the aid of heat. Mix the nitric acid with the remaining 2 of the water, and add the dilute acid to the solution of sulphate of iron. Concentrate the whole by boiling until, by the sudden evolution of ruddy vapours, the liquid ceases to be black, and acquires a red colour. A drop of the solution is now to be tested with ferricyanide of potassium, and if a blue precipitate be formed, a few additional drops of nitric acid should be added and the boiling renewed, in order that the whole may be converted into persulphate of iron. When the solution is cold, make up the quantity to 11 by the addition, if necessary, of distilled water. *Used* in making several preparations of iron; it is also a good styptic.

Solution of Perchloride of Mercury. *Syn.* LIQUOR HYDRARGYRI PERCHLORIDI (B. P.). *Prep.* Corrosive sublimate, 10 grs.; chloride of ammonium, 10 grs.; distilled water, 20 oz.; dissolve.—*Dose.* 30 to 120 minims.

Solution for Plate. *Syn.* PLATE LIQUOR; SOLUTIO PRO ARGENTO, L. *Prep.* From alum, cream of tartar, and common salt, of each, 1 oz.; water, ½ gal.; dissolve. *Used* to increase the lustre and whiteness of silver plate, the articles being boiled in it.

Solution of Potas'sa. *Syn.* SOLUTION OF HYDRATE OF POTASSA, LIQUOR OF POTASSA, POTASH WATER, CAUSTIC P. W.; LIQUOR POTASSÆ (B. P., Ph. L.), AQUA POTASSÆ (Ph. E.), POTASSÆ CAUSTICÆ LIQUOR (Ph. D.), AQUA KALI PURI†, LIXIVIUM SAPONARIUM†, AQUA KALI CAUSTICUM†, LIXIVIUM CAUSTICUM†, L. *Prep.* 1. (Ph. L.) Lime (recently burnt), 8 oz.; boiling distilled water, 1 gal.; sprinkle a little of the water on the lime in an earthen vessel, and, when it is slaked and fallen to powder, add of carbonate of potassa, 15 oz., dissolved in the remainder of the water; bung down, and shake frequently, until the mixture is cold, then allow the whole to settle, and decant the clear supernatant portion into perfectly clean and well-stoppered green-glass bottles. Sp. gr. 1·063. It contains 6·7% of pure potassa.

2. (Ph. E.) Carbonate of potassa (dry), 4 oz.; quicklime, 2 oz.; water, 45 fl. oz.; boiling briskly for a few minutes after each addition of the milk of lime; to yield at least 35 fl. oz., by decantation, after 24 hours' repose in a deep, narrow, glass vessel. Sp. gr. 1·072.

3. (Ph. D.) Pure carbonate of potassa, 1 lb.; distilled water, 1 gal.; dissolve, heat the solution to the boiling-point in a clean iron vessel, gradually add to it of fresh quicklime, 10 oz., previous slaked with water, 7 fl. oz., and continue the ebullition for 10 minutes, with constant stirring; next allow it to cool out of contact with the air, and, when perfectly clear, decant it by means of a syphon, and bottle it as before. Sp. gr. 1·068.

4. (B. P.) Carbonate of potash, 2; slaked lime, 1½; distilled water, 20; dissolve the carbonate of potash in the water, and having heated the solution to the boiling-point in a clean iron vessel, gradually mix the slaked lime, and continue the ebullition for 10 minutes with constant stirring; decant the clear liquid.—*Dose.* 15 to 60 minims 3 times a day in beer, milk, or *Mistura Amygdalæ*.

5. (Wöhler.) Nitrate of potassa, 1 part, is mixed, in alternate layers, with clippings of sheet copper, 2 or 3 parts, and then heated to moderate redness for about ½ an hour in a copper or iron crucible; when cold, the potassa is washed out with distilled water, and the solution, after repose in a closed vessel, decanted as before. Not a trace of copper can be detected in the liquid. The clippings may be again used if mixed with a little fresh metallic copper.

6. (Wholesale.) From carbonate of potash (kali), 1 lb., and quicklime, ½ lb., to each gal. of water.

7. (BRANDISH'S ALKALINE SOLUTION; LIQUOR POTASSÆ BRANDISHII.) From American pearlashes, 6 lbs.; quicklime and wood-ashes (from the ash), of each, 2 lbs.; boiling water, 6 galls. (old meas.); to each gal. of the clear

product is added 12 or 15 drops of oil of juniper. This ‘solution’ is much asked for in trade. Ordinary liquor of potassa is generally sold for it.

Pur. “Nothing, or scarcely anything, is thrown down from this solution on the addition of lime water; and when it has been first saturated by nitric acid, no precipitate falls on the addition of carbonate of soda, chloride of barium, or nitrate of silver. What is thrown down by bichloride of platinum is yellowish.” (Ph. L.)

Uses, &c. Liquor of potassa is antacid, diuretic, resolvent, and lithontriptic.—*Dose,* 10 to 30 or 40 drops, in any bland diluent (not acidulous); in heartburn, gout, calculi, indurations, scrofula, lepra, psoriasis, &c.

Obs. Quicklime fails to abstract the carbonic acid from the alkaline carbonates in solutions much stronger than those above referred to. Weaker solutions may, however, be easily concentrated by evaporation in iron vessels. See HYDRATE OF POTASSA, and *below.*

Solution of Potas'sa (Effervescing). *Syn.* LIQUOR POTASSÆ EFFERVESCENS (B. P.); EFFERVESCING POTASH WATER, SUPERCARBONATE OF POTASSA W.; AQUA POTASSÆ EFFERVESCENS (Ph. E.), A. P. SUPERCARBONATIS, L. *Prep.* (Ph. L. & E.) Bicarbonate of potash, 1 dr.; distilled water, 1 pint; dissolve, force in carbonic acid gas, in excess, and keep it in a well-stoppered bottle. Resembles soda water, but sits better on the stomach. It is almost specific in the early stages of scurvy.

Obs. An excellent substitute for this preparation is to pour a bottle of soda water into a tumbler containing 20 grs. of powdered bicarbonate of potash, and to drink it immediately.

Solution of Potas'sio-tar'trate of An'timony. *Syn.* SOLUTIO ANTIMONII POTASSIO-TARTRATIS, ANTIMONII TARTARIZATI LIQUOR (Ph. D.), L. *Prep.* (Ph. D.) Tartarised antimony, 1 dr.; rectified spirit, 7 fl. oz.; distilled water, 1 pint; dissolve. Strength, doses, and uses, similar to those of antimonial wine (which *see*), than which it keeps better.

Solution, Prophylac'tic. See HAHNEMANN'S SOLUTION.

Solution of Sesquicar'bonate of Ammonia. See SOLUTION OF CARBONATE OF AMMONIA.

Solution of Sil'icate of Potas'sa. See SOLUTION OF FLINTS.

Solution of So'da. *Syn.* SOLUTION OF HYDRATE OF SODA, LIQUOR OF SODA, CAUSTIC SODA WATER; LIQUOR SODÆ (B. P., Ph. L.), SODÆ CAUSTICÆ LIQUOR (Ph. D.), L. *Prep.* 1. (Ph. L.) Carbonate of soda (cryst.), 32 oz.; lime, 9 oz.; boiling distilled water, 1 gal.; proceed as for solution of potassa. “In 100 grs. are contained 1 gr. of (pure) soda.” (Ph. L.) Sp. gr. 1·061.

2. (Ph. D.) Carbonate of soda (cryst.), 2 lbs.; fresh-burned lime, 10 oz.; water, 1 gal. 7 fl. oz.; as liquor of potassa. Sp. gr. 1·056.

3. (B. P.) Carbonate of soda, 7; slaked lime, 3; distilled water, 40; dissolve the carbonate in the water, boil in a clean iron vessel, gradually mixing the lime, and stirring constantly for ten minutes; decant into a green glass bottle, with air-tight stopper. Sp. gr. 1·047.—*Dose.* ½ to 1 dr.

Solution of Soda (Effervescing). *Syn.* SODA WATER; LIQUOR SODÆ EFFERVESCENS, AQUA S. E. (Ph. E.), A. S. SUPERCARBONATIS, SODÆ CARBONATIS AQUA ACIDULA, L. *Prep.* (Ph. E.) Bicarbonate of soda, 1 dr.; distilled water, 1 pint; dissolve, and force carbonic acid gas into the solution, under pressure. *Used* as an antacid and grateful stimulant, often proving gently laxative. The soda water of the shops cannot be substituted for this preparation, as, in opposition to its name, it is usually made without soda.

Solution of Sulphate of Atropia. *Syn.* LIQUOR ATROPIÆ SULPHATIS (B. P.). *Prep.* Sulphate of atropia, 4 grs.; distilled water, 1 oz.; dissolve.—*Dose.* 1 to 2 minims.

Solution, Sol'dering. *Prep.* Dissolve zinc in hydrochloric acid nearly to saturation, add 1-5th part of powdered sal ammoniac, and simmer for 5 minutes. *Used* to make solder flow easily and take well; applied with a feather. See SOLDERING.

Solution, Specif'ic (Frank's). *Syn.* SPECIFIC SOLUTION OF COPAIBA; LIQUOR COPAIBÆ ALKALINA, L. *Prep.* Take of balsam of copaiba, 2 parts; liquor of potassa (Ph. L.), 3 parts; water, 7 parts; boil the mixture for 2 or 3 minutes, put it into a separator, and allow it to stand for 5 or 6 days; then draw it off from the bottom, avoiding the upper stratum of oil, and to the clear liquid add of sweet spirit of nitre (perfectly free from acid), 1 part; should it turn foul or milky, a very little liquor of potassa will usually brighten it; if not, place it in a clean separator, and let it stand, closely covered, for a few days, and then draw it off from the bottom as before, when it will be perfectly transparent, without filtering. Some persons add the sweet spirit of nitre whilst the solution is still warm, mix it in as rapidly as possible, and immediately cork or fasten up the vessel. This is a good way when the article is wanted in a hurry, but is objectionable from the loss of spirit thereby occasioned, and the danger, without care, of bursting the separator.

Obs. A receipt for this article, upon the authority of Battley, has been going the round of the pharmaceutical works for many years. It is as follows:—Take 12 oz. of balsam of copaiba, and 6 oz. of calcined magnesia; rub together, add a pint of proof spirit, filter, and then add ½ oz. of sweet spirits of nitre.” (‘Gray's Supplement.’) The product of this formula, utterly unlike ‘Frank's Specific ‘ lution,’ is a colourless tincture, scarcel- voured with copaiba, and holding very of the active matter of the balsam in sol owing to the compound formed with the nesia being insoluble in spirit. Such is affinity of this earth for copaiba (copaibic acid), that it will even take it from caustic potassa. See COPAIBA, and its preparations.

Solution of Strychnia. *Syn.* LIQUOR STRYCHNIÆ (B. P.). *Prep.* Strychnia, in crystals, 4 grs.; dilute hydrochloric acid, 6 minims; rectified spirit, 2 drs.; distilled water, 6 drs.; mix the hydrochloric acid with 4 drs. of the water, and dissolve the strychnia in it by means of heat; then add the spirit and the remainder of the water.—*Dose.* 4 to 10 minims.

Solution of Subac'etate of Lead. *Syn.* LIQUOR OF SUBACETATE OF LEAD, L. OF DIACETATE OF L.†, GOULARD'S EXTRACT; LIQUOR PLUMBI, L. PLUMBI DIACETATIS (Ph. L.), PLUMBI DIACETATIS SOLUTIO (Ph. E.), PLUMBI SUBACETATIS LIQUOR (Ph. D.), L. *Prep.* 1. (Ph. L.) Acetate of lead, 27 oz.; litharge, in fine powder, 16 oz.; water, 3 quarts; boil for ½ an hour, constantly stirring, and then add enough distilled water to make the whole measure 3 quarts; lastly, filter, if required, and keep it in a closed vessel. The proportions ordered in the Ph. E. are similar. Sp. gr. 1·260.

2. (Ph. D.) Acetate of lead, 6 oz.; litharge, 4 oz.; distilled water, 1 quart; boil, &c., as before; to produce, 1 quart. Sp. gr. 1·066.

3. (Wholesale.) From finely powdered litharge, 32 lbs.; distilled vinegar, 32 galls.; boil in a perfectly bright copper pan for 2 hours, cool, add water to make up 32 galls., again simmer for 1 minute, cover up the vessel, and in an hour decant the clear portion. Common trade strength. (See *below*.)

Solution of Subacetate of Lead (Dilute). *Syn.* GOULARD, GOULARD'S LOTION, G.'S WATER; LIQUOR PLUMBI DIACETATIS DILUTUS (Ph. L.), PLUMBI SUBACETATIS LIQUOR COMPOSITUS (Ph. D.), L. *Prep.* 1. (Ph. L.) Liquor of diacetate of lead, 1½ fl. dr.; proof spirit, 2 fl. drs.; distilled water, 1 pint; mix.

2. (Ph. D.) Solution of subacetate of lead and proof spirit, of each, 2 fl. oz.; distilled water, ½ gal.; mix, filter, and preserve it in a well-stopped bottle.

Obs. Both the above preparations were formerly made with common vinegar, and hence were coloured, but those of the Pharm. are white. If wanted coloured, a little spirit colouring may be added. The stronger liquor is only used diluted; and the dilute solution is now seldom prepared by the wholesale druggist. The last (diluted solution) is employed as a sedative, refrigerant, and astringent wash, in various affections. Both are poisonous. For the antidotes, see LEAD.

Solution of Sul'phate of Mor'phia. *Syn.* LIQUOR MORPHIÆ SULPHATIS, L. *Prep.* From sulphate of morphia, as the solution of the acetate or hydrochlorate. The uses, doses, &c., are the same.

Solution of Sul'phate of Zinc (Compound). See COMPOUND SOLUTION OF ALUM.

Solution of Sul'phuret of Potassium. *Syn.* SOLUTION OF HYDROSULPHATE OF POTASSA; SOLUTIO POTASSII SULPHURETI, LIQUOR POTASSÆ HYDROSULPHATIS, AQUA POTASSÆ SULPHURETI (Ph. D.), L. *Prep.* Take of washed sublimed sulphur, 1 part; water of caustic potassa, 11 parts; mix, boil for 10 minutes, filter, and keep the solution in well-closed bottles. Sp. gr. 1·117. The product is a mixed solution of hydrosulphate and hyposulphite of potassa.—*Dose.* 10 to 60 drops, diluted in water; and, externally, made into a lotion; in itch, and several other eruptive diseases.

SOL'VENT. *Syn.* MENSTRUUM, L. The liquid in which any substance is dissolved. The substance dissolved is, occasionally, called the 'solvend.' (Kirwan.)

Solvent, Glazier's. *Syn.* GLAZIER'S PICKLE. From soft soap dissolved in thrice its weight of strong soaper's lye; or, from freshly slaked lime made into a thin paste or cream with twice its weight of pearlash dissolved in a little water. Very caustic. *Used* to soften old putty, and to remove old paint.

SOOT. *Syn.* FULIGO. Wood soot was formerly officinal, and reputed vermifuge and antiseptic. The soot from pit-coal contains, besides empyreumatic matter, sulphate of ammonia; hence, it is valuable as a manure, when not too freely applied. It is also employed by gardeners to kill insects.

SOPORIF'ICS. Hypnotics (which *see*).

SOU'JEE. *Syn.* SOOJEE. A species of semolina. Semoletta (*semola rarita*) is a still smaller variety of pearled wheat, separated from the others by means of a sieve. 'Baster's soojee' is said to be a mixture of ordinary wheat flour and sugar.

SOUR KROUT. See SAUER-KROUT.

SOUP. A strong decoction of flesh, properly seasoned with salts, spices, &c., for the table. The different tastes of people require more or less of the flavour of spices, salt, garlic, butter, &c., which can, therefore, never be ordered by general rules. If the cook has not a good taste, and attention to that of his or her employers, not all the ingredients which nature and art can furnish will give an exquisite flavour to the dishes. The proper articles should be always at hand, and must be proportioned until the true zest be obtained. A variety of flavours may be given to different dishes served at the same time, or even to the same soup, by varying the condiments and spices. At a Parisian restaurant one cauldron is made to produce almost every imaginable variety of soup.

Soup, Portable. *Syn.* GLAZE. From skin of beef, or other like part; the soup being gently simmered until reduced to the consistence of a thin syrup, and then poured into small upright jelly-pots, with covers, or, upon flat dishes, to lie about ¼ inch deep. The latter, when set, is divided into pieces, which are dried. *Used* to make extemporaneous soup and glazes. A similar article, prepared on the large scale, now generally forms part of every ship's stores.

SOUR'ING. See MALT LIQUORS and WINES.

SOY. Genuine soy is a species of thick black sauce, imported from China. *Prep.* Take of the seeds of *Soja hispida* (white haricots or kidney beans may be used for them), 1 gal.; boil them in water, q. s., until soft, add of bruised wheat, 1 gal., and keep the mixture in a warm place for 24 hours; then add of common salt, 1 gal.; water, 2 galls.; put the whole into a stone jar, and bung it up loosely for two or three months, shaking it very frequently during the whole time; lastly press out the liquor and bottle it; the residuum may be treated afresh with water and salt, for soy of an inferior quality.

Obs. The soy of the shops is, in nine cases out of ten, a spurious article made in this country, by simply saturating molasses or treacle with common salt. A better and a really wholesome imitation is made as follows:—Malt syrup, 1 gall. (or, 13½ lbs.); treacle, 5 lbs.; salt, 4½ lbs.; mushroom juice, 1 quart; mix, with a gentle heat, and stir until the union is complete; in a fortnight decant the clear portion.

SPAN'ISH FLIES. See CANTHARIDES.

SPAR'ADRAP. *Syn.* SPARADRAPUM, L. Originally, a cerecloth; now, applied to spread plasters; as, SPARADRAPUM COMMUNE, common strapping or adhesive plaster; S. VESICATORIUM, blistering plaster or tissue, &c.

SPARTE'INE. *Syn.* SPARTEINA, L. A volatile oily liquid, possessing basic properties, obtained from *Spartium scoparium*, or broom. It is highly poisonous, and resembles conine and nicotine in its general properties.

SPASMS. *Syn.* CRAMP; SPASMUS, L. An involuntary contraction of the muscles, generally of the extremities, accompanied with pain, more or less severe. Spasms are distinguished into clonic spasms or convulsions, in which the contractions and relaxations are alternate, as in epilepsy; and into tonic spasms, in which there is continued rigidity, as in locked-jaw. That form which commonly attacks the muscles of the legs and feet, especially after great exertion or exposure to cold, is commonly called cramp. The best treatment for this is immediately to stand upright, and to well rub the part with the hand. The application of strong stimulants, as spirits of ammonia, or of anodynes, as opiate liniments, has been recommended. When spasm or cramp occurs in the stomach, a teaspoonful of sal volatile in water, or a tablespoonful of good brandy, may be swallowed immediately. When cramp comes or during cold bathing, the limb should be thrown out as suddenly and violently as possible, which will generally remove it, care being also taken not to become flurried or frightened, as presence of mind is very essential to personal safety on such an occasion. A common cause of spasm is indigestion, and the use of acescent liquors; these should, therefore, be avoided, and bitters and absorbents had recourse to. See ANTISPASMODICS, and the names of the principal spasmodic diseases.

SPEAR'MINT. See MINT.

SPE'CIES. (In pharmacy.) Mixtures of dried plants, or parts of plants, in a divided state, which, for convenience, are kept mixed for use. The dry ingredients of pills, conserves, electuaries, mixtures, &c., that do not keep well when made up, or which are in little demand, may be economically and conveniently preserved in this state. The word, thus applied, is obsolete out of the pharmaceutical laboratory.

Species, Anthelmin'tic. *Syn.* SPECIES ANTHELMINTICÆ, L. The dried flowering tops of tansy and wormwood, and the flowers of chamomile, equal parts; mix, and keep them in a close vessel. (P. Cod.)

Species, Aper'itive. See DIURETIC SPECIES (*below*).

Species, Aromat'ic. *Syn.* AROMATIC POWDER; SPECIES AROMATICÆ, L. *Prep.* (Ph. Bor.) Leaves of balm and curled-leaf mint (*Mentha crispa*), of each, 4 oz.; lavender flowers, 2 oz.; cloves, 1 oz.; dry them by a gentle heat, and then powder them.

Species, Astrin'gent. *Syn.* SPECIES ASTRINGENTES, L. The roots of bistort and tormentil, and bark of pomegranate, equal parts. (P. Cod.)

Species, Bitter. *Syn.* THREE BITTER HERBS; SPECIES AMARÆ, HERBÆ AMARÆ, L. The leaves of germander, and dried tops of lesser centaury and wormwood, equal parts. (P. Cod.)

Species, Capil'lary. *Syn.* FIVE CAPILLARY HERBS; HERBÆ QUINQUE CAPILLARES, L. Hart's tongue, black maiden-hair, white do., golden do., and spleenwort, equal parts. (Ph. L. 1720.)

Species, Cor'dial. *Syn.* FOUR CORDIAL FLOWERS; SPECIES CORDIALES, L. The flowers of borage, bugloss, roses, and violets, equal parts. (Ph. L. 1720.)

Species, Diuret'ic. *Syn.* APERIENT ROOTS, APERITIVE SPECIES; SPECIES DIURETICÆ, L. 1. (FIVE GREATER APERITIVE ROOTS—P. Cod., & Ph. E. 1744.) The dried roots of asparagus, butcher's broom, parsley, smallage, and sweet fennel, equal parts.

2. (FIVE LESSER APERITIVE ROOTS.) Those of caper, dog-grass, eryngo, madder, and rest-harrow.

Species, Emol'lient. *Syn.* SPECIES EMOLLIENTES, L. 1. (THREE EMOLLIENT MEALS; FARINÆ EMOLLIENTES.) The meal of barley, linseed, and rye, equal parts. (P. Cod.)

2. (FIVE EMOLLIENT HERBS; HERBÆ QUINQUE EMOLLIENTES.)—*a.* The dried leaves of groundsel, common mallow, marsh-mallow, great mullein, and wall pellitory, equal parts, (P. Cod.)

b. The leaves of mallow, marsh-mallow, French mercury, pellitory of the wall, and violet. (Ph. E. 1744.)

Species for Ene'mas. *Syn.* HERBS FOR CLYSTERS; HERBÆ PRO ENEMATE, L. Mallow leaves, 2 parts; chamomile flowers, 1 part.

Species for Fomenta'tions. *Syn.* SPECIES PRO FOTU, HERBÆ PRO FOTU, L. Leaves of southernwood, tops of sea-wormwood, and flowers of chamomile, of each, 2 parts; bay leaves, 1 part.

Species, Hot. 1. (FOUR GREATER HOT SEEDS.) The seeds of anise, caraway, cumin, and fennel.

2. (FOUR LESSER HOT SEEDS.) The seeds of bishop's weed, smallage, stone parsley, and wild carrot.

Species, Lax'ative. *Syn.* ST. GERMAIN LAXATIVE POWDER; SPECIES LAXANTES ST. GERMAIN, L. *Prep.* (Ph. Bor.) Senna leaves (exhausted with spirit), 4 oz.; elder flowers, 2½ oz.; aniseed and fennel seed, of each, 1¼ oz.; reduce them to coarse powder, and, when dispensing, add of powdered cream of tartar, 1 dr., to each 1½ oz. of the mixture.

Species, Narcotic. *Syn.* FOUR NARCOTIC HERBS; SPECIES NARCOTICÆ, L. Dried leaves of belladonna, black nightshade, henbane, and thorn-apple, equal parts.

Species, Pec'toral. *Syn.* SPECIES BECHICÆ, SPECIES AD INFUSUM PECTORALES, L. 1. Mallow root, 4 oz.; coltsfoot leaves, 2 oz.; liquorice root, 1½ oz.; aniseed, great-mullein flowers and red-poppy flowers, of each, 1 oz.; orris root, ½ oz. (Ph. Bor.)

Species, Refri"gerant.—1. (FOUR COLD SEEDS.) The seeds of cucumber, gourd, melon, and water-melon.

2. (FOUR LESSER COLD SEEDS.) The seeds of endive, lettuce, purslane, and succory.

Species, Resol'vent. *Syn.* FARINÆ RESOLVENTES, L. The meal of the seeds of barley, bean, tare, and white lupin.

SPECIF'IC GRAVITY is the comparative weights of equal bulks of different substances, the assumed standard being 1 and sometimes 1000. This standard is pure distilled water for liquids and solids, and atmospheric air for gaseous bodies and vapours.[1] In England the sp. gr., unless when otherwise expressed, is always taken at 60° Fahr.; but in France it is taken at 32° Fahr. (0° C.), or the temperature of melting ice. In the 'British Pharmacopœia,' whenever specific gravity is mentioned, the substance spoken of is supposed to be of the temperature of 60° Fahr. In most cases, however, it is sufficient merely to note the temperature, and to apply a correction, depending on the known density of water, or air, at the different degrees of the thermometric scale.

To determine the specific gravity of a solid, we weigh it, first in the air, and then in water. In the latter case it loses, of its weight, a quantity precisely equal to the weight of its own bulk of water; and hence, by comparing this weight with its total weight, we find its specific gravity. The rule is—Divide the total weight by the loss of weight in water; the quotient is the specific gravity.

The specific gravity of a substance lighter than water may be determined by attaching it to some substance, as a piece of lead, the sp. gr., &c., of which are known. In this way, by deducting the loss in weight of the two substances, when weighed in water, from the loss sustained by the lead alone, when so weighed, we obtain a difference (*a*) which, added to the weight of the substance taken in air (*b*), gives the respective densities. From these the sp. gr. is found by the rule of three:—

$$(a+b):1::b:sp.gr.$$

The specific gravity of substances soluble in water are taken in pure oil of turpentine, rectified spirit, olive oil, or some other liquid, the density of which is exactly known. Sometimes, for rough purposes, the article is covered with a coating of mastic varnish. This last method answers for mercurial pill.

The specific gravity of a substance in fragments, or in powder, may be found by putting a portion (say 100 grs.) into a sp. gr. bottle, filling the latter with distilled water, and then weighing it. The weight of water which it is found to contain, deducted from 1000 (the weight of the bottle when filled with distilled water), gives a difference (*a*) which bears the same relation to the sp. gr. of water (1·000) as the weight of the powder (*b*) put into the bottle does to the required sp. gr. Or—

$$a:1\cdot000::b:sp.gr.$$

The specific gravity of alloys and mixtures, when no condensation has occurred, is equal to the sum of the weights divided by the sum of the volumes, compared to water reckoned as unity; and is not merely the arithmetical mean between the two numbers denoting the two sp. gr., as is frequently taught. See BEADS (Lovi's), HYDROMETER, MIXTURES (Arithmetic of), &c. For the mode of determining the specific gravity of gases, the reader is referred to the works on chemistry of Miller and Fownes.

The specific gravity of a liquid is found by weighing it in a sp. gr. bottle, glass flask, or other vessel of known capacity, and dividing that weight by the weight of the same bulk of water; the quotient is, as before, the specific gravity. A bottle of the capacity of 1000 water-grains (specific gravity bottle) gives the density of a liquid at once, by simply filling it to the given mark, and then accurately weighing it.

SPEC'TACLES. See EYE, VISION, &c.

SPEC'TROSCOPE. An instrument devised for examining the spectra of flames. (See *below*.)

SPECTRUM ANAL'YSIS. A method of

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[1] By many modern chemists *hydrogen*, the lightest substance in nature, is taken as the standard for the specific gravity of gases and vapours.

determining the chemical constituents of substances, devised by Kirchhoff and Bunsen. It consists in letting the rays of a flame, coloured by the substance under examination, pass first through a narrow slit, then through a prism, and observing them, when thus refracted, through a telescope. A distinct spectrum is obtained for every flame-colouring metal; thus, sodium, which gives a yellow colour to the flame, has a spectrum consisting of a double yellow line; potassium, which burns with a purple light, gives red and blue lines; lithium also gives red and blue lines, but they are of a different tint and in a different part of the spectrum; calcium gives red, yellow, green, and blue lines; barium a great number of green lines, and so on. To produce a suitable flame, of great heating power but small luminosity, a Bunsen's gas-lamp is usually employed; in this flame the substance to be examined is burned on a loop of fine platinum wire. The instrument employed for producing and viewing the spectra is called a spectroscope. This method of analysis is so delicate, that a quantity of sodium but little exceeding the millionth part of a grain may be detected by it. Since its introduction, four new metals have been discovered by it, namely, cæsium, rubidium, thallium, and indium.[1] See FLAME COLOURS, &c.

SPEC'ULUM MET'AL. *Prep.* 1. Take of copper, 64 parts; pure tin, 29 parts; melt them separately under a little black flux; next incorporate them thoroughly by stirring with a wooden spatula, and run the metal into the moulds, so that the face of the intended mirror may be downwards; lastly, allow the whole to cool very slowly.

2. Pure copper, 2 parts; pure tin, 1 part. *Used* to make the mirrors of reflecting telescopes. The addition of a little metallic arsenic renders it whiter.

SPEL'TER. See ZINC.

SPERMACE'TI. *Syn.* CETACEUM (B. P., Ph. L. E. & D.), L. A concretion prepared from the oily matter of the head of the *Physeter macrocephalus*, or spermaceti whale. It is demulcent and emollient; chiefly used in ointments and cerates.

SPHEROID'AL STATE. It is found that water, or any other volatile liquid, thrown on a metallic plate heated to dull redness, is not resolved into vapour, but, assuming a somewhat globular form, remains intact, until the temperature becomes sufficiently lowered to allow of contact between the liquid and the heated surface. It is then immediately volatilised. M. Boutigny, who fully investigated this subject, has also shown that the same thing happens when a solid body containing water is substituted for the liquid in the above and similar experiments. Thus, the finger or hand, under certain restrictions, may be thrust, with perfect impunity, into a stream of molten metal, and ice may be produced by throwing water into a red-hot crucible. This last experiment, as performed by MM. Boutigny and Prevostaye, is essentially as follows:—A thick platinum crucible, of the capacity of 1 fl. oz., is heated to redness over a powerful spirit lamp, and some liquid anhydrous sulphurous acid (a very volatile substance) poured into it by means of a pipette; the acid assumes a spheroidal form, and does not evaporate; a few drops of water are now introduced into the sulphurous acid in the same way; the diluted and slightly cooled acid instantly flashes off in vapour, and, robbing the water of its caloric, leaves the latter in a frozen state; and, if the operator seizes the right moment, a solid lump of ice may be thrown out of the red-hot crucible.

SPICE. A general name for vegetable substances possessing aromatic and pungent properties, and employed for seasoning or flavouring food.

Spice, Horse. *Syn.* COW SPICE; SPECIES EQUINUS, L. *Prep.* 1. Aniseed, allspice, cumin seed, ginger, liquorice, and turmeric, equal parts.

2. Turmeric and cumin seed, of each, 5 lbs.; ginger, 2½ lbs. Used by farriers.

Spice, Kit'chen. *Syn.* MIXED SPICE, KITCHEN PEPPER, &c. *Prep.* From black pepper, 2 lbs.; ginger, 1 lb.; cinnamon, allspice, and nutmegs, of each, 8 oz.; cloves, 1 oz.; dry salt, 6 lbs.; well ground together. Useful to flavour gravies, soups, &c.

Spice, Mixed. As the last, omitting half the salt.

Spice, Pease. See POWDER.

Spice, Ragout. *Prep.* From dry salt, 1 lb.; flour of mustard, black pepper, and grated lemon peel, of each, ½ lb.; cayenne pepper, 2 oz.; allspice and ginger, of each, 1 oz.; nutmeg, ½ oz.; all separately powdered.

Spice, Sausage (French). *Syn.* EPICE FINES, Fr. *Prep.* From black pepper, 5 lbs.; ginger 2½ lbs.; cloves and nutmegs, of each 1 lb.; aniseed and coriander seeds, of each, ½ lb.; powder and mix them.

Spice, Sa''voury. *Prep.* 1. (Kidder's.) From cloves, mace, nutmegs, pepper, and salt, equal parts. Used by cooks.

2. (Dr. Kitchener's.) See RAGOUT SPICE (*above*).

Spice, Soup. *Syn.* KITCHENER'S SOUP-HERB POWDER, KITCHENER'S VEGETABLE RELISH, &c. *Prep.* From parsley, lemon thyme, sweet marjoram, and winter savoury, of each, dried, 2 oz.; sweet bazil and yellow peel of lemon, of each, dried, 1 oz.; mix, and powder.

Spice, Sweet (Kidder's). *Prep.* From cinnamon, cloves, mace, nutmegs, and sugar, equal parts. Used in pastry.

SPIGE'LIA. *Syn.* CAROLINA PINK ROOT; SPIGELIA (Ph. E.), L. The root of *Spigelia Marilandica*, or worm grass. It is purgative, narcotic, and vermifuge.—*Dose.* 10 to 40 grs., in powder or infusion, night and morning.

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[1] See the last edition of Fownes's "*Manual of Chemistry*, and Watts's "*Dic. of Chemistry*."

until the worms are expelled. Rhubarb or calomel is commonly added to it.

SPIRIT. *Syn.* SPIRITUS, L. Under this term are included all the inflammable and intoxicating liquors obtained by distillation, and used as beverages, as BRANDY, GIN, RUM, &c., each of which is noticed in its alphabetical order. Spirit may also be obtained by fermentation and distillation from all vegetable juices or solutions that contain sugar.

The spirit used in pharmacy and chemistry is distinguished by names which have reference to its richness in alcohol. (See TABLES.)

I. TABLE *of the Pharmacopœial Spirits.*

	Sp. gr.	
Alcohol, Ph. B. (absolute) . . .	0·795	nearly pure Alcohol.
„ Ph. E.	0·796	
„ Ph. D. 1826	0·810 or 70% o. p.	
„ Ph. L. 1836	0·815 „ 68% „	
Stronger Spirit (Spiritus Fortior), Ph. D.	0·818 „ 66% „	
**Rectified Spirit* (Spirit of Wine; Spiritus Rectificatus), B. P.	0·838 „ 56% „	
Rectified Spirit, Ph. D. . . .	0·840 or 54½% o. p.	
Proof Spirit (Spiritus Tenuior), Ph. B.	0·920 „ —	
Alcohol (absolu), P. Cod. . .	0·797 „ —	
„ (at 40°) „	0·810 „ 70% „	
„ (du commerce), P. Cod. .	0·863 „ 41% „	
„ (faible) „ . .	0·923 „ 2½% u. p.	

* "This spirit can be reduced to the standard of the weaker (or proof) spirit, by adding, to every 5 pints of it, 3 pints of distilled water, at 62° Fahr." (Ph. L.)

II. TABLE *of the principal Spirituous Liquors sold in England, with their usual Strengths, &c.*

Denomination.	Revenue Mark.	Import Strength.	Legal Limits of Strength.	Usual Selling Strength.			Specific Gravity at 60° Fahr.
				By *Permit.*	Contains Alcohol of 0·825.	Contains Absolute Alcohol.	
*Gin (*strongest*) . .	X (17 u. p.)	......	Not stronger than 25 o. p.	17 u. p.	......	40%	0·9395
*Do. (*best ordinary*) .	X (22 u. p.)	......	do.	22 u. p.	......	37·4%	0·9445
†Do. (*cordial*) . .	X (22 u. p.)	......	do.	22 u. p.	......	do.	‖0·
†Do.	X (24 u. p.)	......	do.	24 u. p.	......	36·5%	‖0·
‡Peppermint . .	X mint.	......	do.	60 u. p.	......	21%	‖0·
‡Do.	do.	......	do.	64 u. p.	......	18%	‖0·
‡Cloves . .	X (64 u. p.)	......	do.	64 u. p.	......	do.	‖1·065 to 1·080
‡Bitters . .							
‡Raspberry .							
‡Noyau . .							
‡Cinnamon .							
‡Tent . .							
‡Aniseed . .							
‡Caraway . .							
‡Lovcage . .							
‡Usquebaugh .							
‡Orange Cordial .							
‡Citron . .							
Rum	R.	About 10 o. p. to 43 o. p.	No limit.	11 u. p.	......	43%	0·9329 to 0·8597
‡Rum Shrub . .	R. Sh.	......	do.	64 u. p.	......	18%	‖0·
‡Do.	do.	......	do.	60 u. p.	......	21%	‖0·
French Brandy . .	F.	About 5 o. p. to 8 or 10 u. p.	do.	10 u. p.	......	44%	0·9318
§Spirit of Wine . .	S. W.	......	Not less than 43 o. p.	54 to 64 o. p.	......	......	0·8415 to 0·8221
Malt, grain, or molasses spirit (*sent out by British distillers*) . . .	P. S.	......	Not stronger than 25 o. p.	......	......	......	0·8669 to 0·9318
Hollands . . .	Geneva.	......	No limit.	......	51·60%	40·5%	0·9358
Whiskey (*Irish*) . .	P. S.	......	Not stronger than 25 o. p.	......	54%	50%	
Do. (*Scotch*) .	P. S.	......		......	54·3%	50·2%	

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* Frequently retailed at 25 to 35 u. p.

† Though 'permitted' at 22 to 24, are generally from 25 to 35 u. p., or even weaker.

‡ These, though 'permitted' at 60 or 64 u. p., are generally 75 or 80 u. p.

§ Usual strength 54 to 60 o. p.

‖ The specific gravity is no guide when sugar is present, as in compounds.

Spirituous liquors, like all other fluids at common temperatures, expand when they are heated, and diminish in volume when they are cooled. It is found that 1000 galls. of proof spirit, measured at the temperature of 50° Fahr., will, if re-measured at 59°, be found to have increased in bulk to fully 1004¼ galls.; whilst 1000 galls. of the same spirit, measured at 77° Fahr., will be only equal to 991⅓ galls. at 59°. These changes are still more marked at higher strengths, and at extreme temperatures, and, from not being recognisable by the hydrometer, often lead to serious losses in trade, and to serious fluctuations in 'stock,' which, to those unaware of the action of temperature, are perfectly unaccountable. A gallon of proof spirit only weighs 9⅕ lbs. at 60° Fahr. At a higher temperature it will weigh less—at a lower one, more; but as this weight constitutes the standard gallon at the temperature the proof is calculated for, it is manifest that any variations from it must result in loss either to the buyer or seller. Hence the equity of buying and selling liquors by weight, instead of by measure. The stock-keeper in every wholesale house should be aware of this fact, and on 'taking stock' should as regularly enter the temperature of his liquors in his stock-book as he does the 'dip' or 'wet inches.' See Alcohol, Alcoholometry, Specific Gravity, Spirits (Medicinal), Spirits (Perfumed), &c.

Spirit, Amyl′ic. See Fusel Oil.

Spirit, Dyer's. See Tin Mordants.

Spirit, Meth′ylated. Spirit of wine to which one tenth of its volume of wood naphtha (strength not less than 60° o. p.) has been added, the object of such addition being that of rendering the mixture unpotable through its offensive odour and taste. The purification of this mixed spirit, or the separation of the two alcohols, though often attempted, has always proved a failure. It might be supposed that, owing to the low boiling-point of methylic alcohol, simple distillation would effect this; but experience has shown that both spirits distil over simultaneously. This is, no doubt, due to the difference of their vapour densities. Methylated spirit, being sold duty free, can be employed by the chemical manufacturer as a solvent in many processes for which, from its greater cost duty-paid spirit would be commercially inapplicable. But in the preparation of medicines, containing spirit, as the vehicle or menstruum by which more active substances are administered, the employment of methylated spirit is highly improper. The Council of the Pharmaceutical Society obtained from the Pharmacopœia Committee of the Medical Council, the decided opinion that "the substitution of 'methylated' for 'rectified' spirit in any of the processes of the Pharmacopœia should be strictly prohibited."

The use of methylated spirit in the preparation of tinctures, sweet spirit of nitre, common ether, or any medicine to be used internally, is now prohibited by law.

Spirit, Proof. See *above.*

Spirit, Pyroace′tic. *Syn.* Acetone; Spiritus pyroaceticus, L.; Acétone, Esprit pyroacétique, Fr. An inflammable volatile liquid obtained with carbonic acid and other products when the metallic acetates in an anhydrous state are subjected to destructive distillation. The acetate of lead is the most eligible salt for this purpose.

Prep. 1. Dried acetate of lead is carefully distilled in a large earthen or coated-glass retort, by a heat gradually raised to redness, the volatile products being passed through a condenser well supplied with cold water. The distillation is continued until nothing but finely divided lead (lead pyrophorus) remains in the retort. The receiver contains crude acetone, which is to be saturated with carbonate of potassa, and afterwards rectified in a water bath from chloride of calcium.

2. By passing the vapour of strong acetic acid through an iron tube heated to dull redness, and condensing the acetone thus formed.

Obs. In both of the above processes carbonic acid and other permanent gases are produced, consequently the receiver must not fit too closely to the tube of the condenser.

Prop. Colourless, limpid, of peculiar odour, and very inflammable, giving a brilliant flame, without smoke; boiling-point 132° Fahr.; sp. gr. ·792. It dissolves resins and essential oils. See Mesitilol, Mesityl, Metacetone, &c.

Spirit, Pyroxyl′ic. *Syn.* Pyroligneous spirit, Wood s., Medicinal naphtha, Wood n., Hydrated oxide of methyl; Spiritus pyroxylicus (Ph. D.), L. A light volatile liquid, discovered by P. Taylor, in 1812, among the limpid products of the distillation of dry wood. It has been shown by Dumas and Peligot to be "really a second alcohol, forming an ether, and a series of compounds (mythyl-series) exactly corresponding with those of vinous spirit, and, in some points, even more complete than the latter."

Prep. Crude pyroligneous acid (which contains about 1% of the spirit) is subjected to distillation, and the first or more volatile portion which passes over is neutralised with hydrate of lime. After repose, the clear liquid is separated from the oil which floats on the surface, and from the sediment at the bottom of the vessel; this, when redistilled, forms the wood spirit of commerce. It may be strengthened in the same manner as ordinary alcohol, by rectification, and ultimately rendered pure by careful distillation from quicklime by the heat of a water bath. Berzelius recommends the crude spirit to be agitated with a fatty oil, to remove empyreumatic matter, and then to rectify it, first, from recently burnt charcoal, and next with chloride of calcium.

Prop., &c. Pure pyroxylic spirit is a transparent colourless liquid, having a penetrating ethereal smell, and a hot disagreeable taste; it is very inflammable, burning with a pale blue flame. It is neutral to test paper; mixes with water, alcohol, and ether, in all proportion; and boils at 152° Fahr.; sp. gr. ·798 at 68° Fahr. (Regnault and Liebig.) Dr. Ure states the sp. gr. to be ·824 at 60°; the Dublin College makes it ·846. That of the latter must therefore have contained a little water. It does not dissolve India rubber and gutta percha, like mineral or true naphtha.

Pyroxylic spirit is distinguished from acetone or pyroacetic spirit by the character of its flame, and by freely dissolving chloride of calcium, which is quite insoluble in the latter. In a mixture of these two liquids two distinct strata are formed when this substance, either in powder or concentrated solution, is added.

Pyroxylic spirit is distinguished from vinous spirit by Nessler's test (which *see*), by its forming a solid crystalline salt (methylic oxalate) when distilled with an oxalate and sulphuric acid, and by its lower boiling-point. The presence of alcohol, in a mixture of the two, is readily detected by distilling the suspected sample with sulphuric acid. The formation of common ether indicates ethylic alcohol, and from the amount formed the proportion of alcohol may be determined.

Uses, &c. Chiefly to dissolve resins and volatile oils, especially shell-lac, and as a substitute for alcohol in spirit lamps. As a medicine, it is anodyne and sedative; and has been beneficially employed by Drs. Christison, Hastings, and Neligan, to allay the harassing cough, troublesome vomiting, and excessive expectoration, in phthisis and some other affections.—*Dose.* 5 to 30 drops, thrice a day, in water.

Spirit, Rai'sin. *Prep.* From raisins fermented along with water, and the wash distilled by a quick fire. *Used* to give a brandy flavour to malt spirit. 1 gal. added to 150 galls. of plain spirit, along with some colouring, and a little catechu, either with or without a little acetic ether, makes a very decent 'British Brandy.'

Spirit, Rec'tified. See ALCOHOL, and TABLE I, under SPIRIT.

Spirit of Salt†. Hydrochloric acid.

Spirit of Soup-herbs. As essence of soup-herbs, but substituting 1 quart of brandy or proof spirit for the rectified spirit.

Spirit of Wine. See ALCOHOL, and TABLE I, under SPIRIT.

SPIRITS (Medic'inal). *Syn.* SPIRITUS MEDICINALES, L. The spirits of pharmacy are either prepared by macerating the bruised seeds, flowers, herbs, &c., in the spirit, for 2 or 3 days before distillation, and then drawing it off by a gentle heat; or extemporaneously, by adding a proper proportion of essential oil to pure spirit of the prescribed strength. This latter plan is very generally adopted in the Ph. D. In the first method, when a naked fire is employed, a little water is put into the still along with the spirit, to prevent empyreuma. These spirits are principally employed as aromatics and stimulants, or as adjuvants in draughts and mixtures.

The following are the principal medicinal spirits:—

Spirit of Ammo″nia. *Syn.* SPIRITUS AMMONIÆ (Ph. E.). *Prep.* 1. (Ph. E.) Take of quicklime, 12 oz.; slake it with water, 6½ fl. oz.; add of finely powdered chloride of ammonium, 3 oz.; and distil in a glass retort furnished with a tube reaching nearly to the bottom of a bottle containing rectified spirit, 2 pints, and kept well cooled. A sand heat is to be employed, and the distillation continued as long as anything passes over. The product has a sp. gr. about ·845, and should not effervesce with acids. The alkali is here in the caustic state, and in this respect it resembles the spirit of ammonia, Ph. U. S., and Dzond's caustic spirit of ammonia, Ph. Bor.

2. (Ph. L. 1836.) Chloride of ammonium, 10 oz.; carbonate of potassa, 16 oz.; rectified spirit and water, of each, 3 pints; mix, and let 3 pints distil.

3. (Ph. D. 1826.) Dissolve 3½ oz. of carbonate of ammonia, in rectified spirit, 3 wine pints.

Obs. The ammonia in the last two preparations exists in the carbonated state. They are chiefly employed to make other preparations.

4. (ANISATED SPIRIT OF AMMONIA; LIQUOR AMMONIÆ ANISATUS, SPIRITUS A. A.—Ph. Bor.) Rectified spirit, 12 oz.; oil of aniseed, 3 drs.; dissolve, and add of caustic solution of ammonia (·960), 3 oz.

5. (AROMATIC SPIRIT OF AMMONIA, SPIRIT OF SAL VOLATILE; SPIRITUS AMMONIÆ AROMATICUS—B. P., Ph. L. E. & D.)—*a.* (Ph. L.) Take of hydrochlorate of ammonia, 6 oz.; carbonate of potassa, 10 oz.; cinnamon and cloves, of each, bruised, 2½ drs.; fresh lemon peel, 5 oz.; rectified spirit and water, of each, 2 quarts; mix, and distil 3 quarts. Sp. gr. ·918.

b. (Ph. E.) Spirit of ammonia, 8 fl. oz.; oil of rosemary, 1½ fl. dr.; oil of lemon peel, 1 fl. dr.; mix.

c. (Ph. D.) Rectified spirit, 3 pints; oil of lemon, ½ fl. oz.; oil of nutmeg, 2 fl. drs.; oil of cinnamon, ½ fl. dr.; dissolve, and add of stronger solution of ammonia, 6 fl. oz. Sp. gr. ·852.

d. (B. P.) Carbonate of ammonia, 8 oz.; strong solution of ammonia, 4 oz.; volatile oil of nutmeg, 4 drs.; oil of lemon, 6 drs.; rectified spirit, 6 pints; water, 3 pints; distil 7 pints.—*Dose.* 20 to 60 minims in camphor water.

Obs. The ammonia exists in the state of neutral carbonate in the product of the *a* formula, but in the caustic state in those of the others.—*Dose.* ½ to 1 fl. dr., in water, or any bland liquid; as a diffusible stimulant and antacid, in debility, low spirits, dyspepsia, heartburn, flatulent colic, hysteria, &c. The spirit of sal volatile of the shops is generally a spurious compound of little more than half the above strength.

6. (FETID SPIRIT OF AMMONIA; SPIRITUS AMMONIÆ FŒTIDUS—B. P., Ph. L. E. & D.), L.—*a.* (Ph. E.) Hydrochlorate of ammonia, 10 oz.; carbonate of potassa, 16 oz.; assafœtida, 5 oz.; rectified spirit and water, of each, 3 pints; mix well, then slowly distil 3 pints. Sp. gr. ·861.

b. (Ph. E.) Spirit of ammonia, 10½ fl. oz.; assafœtida (broken small), ½ oz.; digest for 12 hours, then distil 10½ fl. oz., by the heat of a vapour (water) bath.

c. (Ph. D.) Assafœtida, 1½ oz.; rectified spirit, 1½ pint; digest for 24 hours, then distil off the whole of the spirit, and mix the product with stronger solution of ammonia, 3 fl. oz. Sp. gr. ·849.

d. (B. P.) Strong solution of ammonia, 2; assafœtida, in small pieces, 1½; rectified spirit, sufficient; macerate the assafœtida in 15 of the spirit for 24 hours, distil, add the distillate to the ammonia, and make up with spirit to 20. —*Dose.* ½ to 1 dr.

Obs. The dose, &c., are the same as those of the last, but it is preferred for hysterical and spasmodic affections.

Spirit, Amyl'ic. *Syn.* ALCOHOL AMYLICUM (Ph. D.), L. See FUSEL OIL.

Spirit of An'iseed. *Syn.* SPIRITUS ANISI (Ph. L.), L. *Prep.* 1. (Ph. L.) Oil of aniseed, 3 fl. drs.; proof spirit, 1 gal.; dissolve. Carminative.—*Dose.* ½ fl. dr. to 4 fl. drs.

2. (ESSENTIA ANISI—Ph. D.) Oil of aniseed, 1 fl. oz.; rectified spirit, 9 fl. oz.; mix with agitation. Chiefly used to make aniseed water.

3. (COMPOUND SPIRIT OF ANISEED; SPIRITUS ANISI COMPOSITUS—Ph. D. 1826.) Aniseed and angelica seed, of each, ½ lb.; proof spirit, 1 gal.; water, q. s.; distil 1 gallon. When coloured with saffron, or sap green, it closely resembles the Irish usquebaugh. (Montgomery.)—*Dose.* 1 to 4 fl. drs.

Spirit, Arquebusade'. See VULNERARY SPIRIT (*below*).

Spirit of Balm (Compound). *Syn.* BALM WATER, CARMELITE W.; AQUA MELISSÆ COMPOSITA, SPIRITUS M. COMPOSITUS, L.; EAU DES CARMES, EAU DE MELISSE DES CARMES, Fr. *Prep.* 1. (P. Cod.) Fresh flowering tops of balm, 24 oz.; fresh lemon peel, 4 oz.; cinnamon, cloves, and nutmegs, of each, 2 oz.; coriander seed and dried angelica root, of each, 1 oz.; rectified spirit, 8 lbs.; macerate for 8 days and distil in a water bath to dryness. The spirit is much esteemed in France as a stomachic, a cosmetic, and a stimulant.

Spirit, Bath'ing. Soap liniment.

Spirit of Cam'phor. *Syn.* CAMPHORATED SPIRIT; SPIRITUS CAMPHORÆ (B. P., Ph. L.), TINCTURA CAMPHORÆ, SPIRITUS CAMPHORATUS, L. *Prep.* 1. (Ph. L.) Camphor, 5 oz.; rectified spirit, 1 quart; dissolve.

2. (B. P.) Camphor, 1; rectified spirit, 9; dissolve.—*Dose.* 10 to 30 minims, in milk or on sugar. *Used* as an application to chilblains, and in chronic rheumatism, cholera, &c. See DROPS, ESSENCE, and TINCTURE.

Spirit of Car'away. *Syn.* SPIRITUS CARUI (Ph. L. & E.), L. *Prep.* 1. (Ph. L.) Oil of caraway, 2 fl. drs.; proof spirit, 1 gal.; dissolve.

2. (Ph. E.) Caraway seeds (bruised), ½ lb.; proof spirit, 7 pints; macerate for 2 days in a covered vessel, then add of water, 1½ pint, and distil 7 pints. Aromatic and carminative.—*Dose.* 1 to 4 fl. drs. A similar spirit, "sweetened with sugar, is drunk in Germany as a dram (KÜMELLIQUEUR; KÜMELBRANDTWEIN).

3. (ESSENTIA CARUI—Ph. D.) Oil of caraway, 1 fl. oz.; rectified spirit, 9 fl. oz. *Used* to make caraway water.

Spirit of Cas'sia. *Syn.* SPIRITUS CASSIÆ (Ph. E.), L. *Prep.* From coarsely powdered cassia, 1 lb.; proof spirit, 7 pints; water, 1½ pint, or q. s.; draw off 7 pints.—*Dose*, &c., as the last. It is almost universally substituted for spirit of cinnamon.

Spirit of Cin'namon. *Syn.* SPIRITUS CINNAMOMI (Ph. L. & E.), L. *Prep.* 1. (Ph. L.) Oil of cinnamon, 2 fl. drs.; proof spirit, 1 gal.; dissolve.

2. (Ph. E.) From cinnamon, as spirit of cassia.—*Dose.* 1 to 4 fl. drs.

3. (ESSENTIA CINNAMOMI—Ph. D.) Oil of cinnamon, 1 fl. oz.; rectified spirit, 9 fl. oz. *Used* to make cinnamon water, &c.

Spirit of E'ther. *Syn.* SPIRIT OF SULPHURIC ETHER, SWEET SPIRIT OF VITRIOL†; SPIRITUS ÆTHERIS (B. P.), SPIRITUS ÆTHERIS SULPHURICI (Ph. E.), L. *Prep.* 1.—*a.* (Ph. E.) Sulphuric ether, 1 part; rectified spirit, 2 parts. Sp. gr. ·809. *Obs.* This preparation should be neutral to test paper, mix (clear) with water, and, when shaken with twice its volume of concentrated solution of chloride of calcium, 28% of ether should separate.—*Dose.* ½ to 2 or 3 fl. drs.; as a stimulant and anodyne.

b. (B. P.) Ether, 1; rectified spirit, 2; mix. —*Dose.* 30 to 60 minims.

2. (COMPOUND SPIRIT OF ETHER, HOFFMANN'S ANODYNE LIQUOR; SPIRITUS ÆTHERIS COMPOSITUS (Ph. L.), S. ÆTHERIS OLEOSUS (Ph. D.), L.—*a.* (Ph. L.) Ether, 8 fl. oz.; rectified spirit, 16 fl. oz.; ethereal oil, 3 fl. drs.; mix.

b. (Ph. D.) Mix in a glass matrass, oil of vitriol, 1½ pint, with rectified spirit, 1 pint; connect this with a Liebig's condenser, apply heat, and distil until a black froth begins to rise; then separate the upper stratum of the distilled liquid, and, having exposed it to the air for 24 hours, let the oil be transferred to a moist paper filter, and washed with a little cold water; lastly, dissolve it in a mixture of rectified spirit, ½ pint; sulphuric ether, 5

Obs. This compound is anodyne and antispasmodic, and was once held in very great repute.—*Dose.* ½ to 2 fl. drs.

3. (AROMATIC SPIRIT OF ETHER, A. S. OF SULPHURIC E., SWEET ELIXIR OF VITRIOL†; SPIRITUS ÆTHERIS AROMATICUS, L. *Prep.* (Ph. L. 1824.) Bruised cinnamon, 3 drs.; cardamoms, 1½ dr.; long pepper and ginger, of each, 1 dr.; rectified spirit, 10 fl. oz.; sulphuric ether, 5 fl. oz.; mix, and digest 14 days. The last two preparations are also frequently called 'sweet elixir of vitriol.'

Spirit of Harts'horn. *Syn.* LIQUOR OR SPIRITUS VOLATILIS CORNU CERVI, L. Originally distilled from hartshorn. Dilute liquor of ammonia is now generally sold for spirit of hartshorn.

Spirit of Horserad'ish (Compound). *Syn.* SPIRITUS ARMORACIÆ COMPOSITUS (B. P., Ph. L.), L. *Prep.* 1. (Ph. L.) Sliced horseradish and dried orange peel, of each, 20 oz.; bruised nutmegs, 5 drs.; proof spirit, 1 gal.; water, 1 quart, or q. s.; distil 1 gal. Stimulant and diuretic.—*Dose.* 1 to 4 fl. drs.; in dropsies, when there is much debility. It is usually combined with infusion of juniper berries or foxglove.

2. (B. P.) Fresh root, sliced, 20; dried orange peel, 20; nutmeg, bruised, ½; proof spirit, 160; water, 40; mix, and distil over 160.—*Dose.* 1 to 3 drs.

Spirit of Hydrochlo''ric Ether. *Syn.* SPIRIT OF MURIATIC ETHER, CLUTTON'S FEBRIFUGE SPIRIT; ÆTHER HYDROCHLORICUS ALCOHOLICUS, SPIRITUS ÆTHERIS MURIATICI, L. *Prep.* 1. From hydrochloric ether and rectified spirit, equal parts; mixed together.

2. (Ph. E. 1744.) Hydrochloric acid, 1 part; rectified spirit, 3 parts; digest some days, and distil in a sand bath.—*Dose.* ½ to 3 fl. drs.; in dyspepsia, liver complaints, hectic fever, &c.

Spirit of Juni''per. *Syn.* SPIRITUS JUNIPERI (B. P.). *Prep.* English oil of juniper, 1; rectified spirit, 49; dissolve.—*Dose.* 30 to 60 minims.

Spirit of Juniper (Compound). *Syn.* SPIRITUS JUNIPERI COMPOSITUS (Ph. L. E. & D.), L. *Prep.* 1. (Ph. L.) Oil of juniper, 1½ fl. dr.; oils of caraway and fennel, of each, 12 drops; proof spirit, 1 gal.; dissolve.

2. (Ph. L. 1836.) Juniper berries, bruised, 15 oz.; caraway and fennel seed, of each, bruised, 2 oz.; proof spirit, 1 gal.; water, 1 quart, or q. s.; distil 1 gallon.

Obs. This spirit is stimulant and diuretic.—*Dose.* 2 to 4 fl. drs. Mixed with twice or thrice its weight of proof spirit, and sweetened with a little sugar, it makes no bad substitute for Hollands gin.

Spirit of Lav'ender. *Syn.* SPIRITUS LAVANDULÆ (B. P., Ph. E.), L. *Prep.* From fresh lavender, 2½ lbs.; rectified spirit, 1 gal.; water, 1 quart, or q. s.; distil 1 gallon (7 pints—Ph. E.).

2. (Wholesale.) From Mitcham oil of lavender, 3 oz.; rectified spirit, 1 gal.; dissolve. Cordial and fragrant.

3. (B. P.) English oil of lavender, 1; rectified spirit, 49; dissolve.—*Dose.* 30 to 60 minims. See SPIRITS (Perfumed), TINCTURE, &c.

Spirit of Ni'tric Ether. *Syn.* SPIRIT OF NITROUS ETHER, SWEET SPIRIT OF NITRE, NITROUS ETHEREAL SPIRIT, NITRE DROPS; SPIRITUS ÆTHERIS NITRICI (B. P., Ph. L. & E.), SPIRITUS ÆTHEREUS NITROSUS (Ph. D.), L. *Prep.* 1. (Ph. L.) Take of rectified spirit, 1 quart; nitric acid, 3½ fl. oz.; add the acid, by degrees, to the spirit; then mix them, and let 28 fl. oz. distil over. An earthenware still and condensing worm should be employed. Sp. gr. ·834.

2. (Ph. E.) Pure hyponitrous ether (Ph. E.), 1 part; rectified spirit, 4 parts; (both by volume;) mix. Sp. gr. ·847.

3. (Ph. D.) Nitrous or hyponitrous ether (which has been washed with half of its volume of liquor of ammonia), 4 fl. oz.; rectified spirit, "in 42 fl. oz.; mix, and preserve the compound in small, strong, and accurately stopped bottles."

4. (B. P.) Nitric acid (sp. gr. 1·42), 3; sulphuric acid, 2; copper, in fine powder (No. 25), 2; rectified spirit, a sufficiency; to 20 of the spirit add gradually the sulphuric acid, stirring them together; then add to this, also gradually, 2½ of the nitric acid. Put the mixture into a retort or other suitable apparatus, into which the copper has been introduced, and to which a thermometer is fitted. Attach now an efficient condenser, and, applying a gentle heat, let the spirit distil at a temperature commencing at 170° and rising to 175°, but not exceeding 180°, until 12 have passed over and been collected in a bottle kept cool, if necessary, with ice-cold water; then withdraw the heat, and, having allowed the contents of the retort to cool, introduce the remaining ½ of nitric acid, and resume the distillation as before, until the increased product has been increased to 15. Mix this with 40 of the rectified spirit, or as much as will make the product correspond to the tests of specific gravity and per-centage of ether separated by chloride of calcium. Preserve it in well-closed vessels.

Char. and Tests. Transparent, and nearly colourless, with a very slight tinge of yellow, mobile, inflammable, of a peculiar penetrating apple-like odour, and sweetish, cooling, sharp taste. It effervesces feebly, or not at all, when shaken with a little bicarbonate of soda. When agitated with solution of sulphate of iron and a few drops of sulphuric acid, it becomes deep olive-brown or black. If it be agitated with twice its volume of a saturated solution of chloride of calcium in a closed tube, 2⅖ of its original volume will separate in the form of nitrous ether, and rise to the surface of the mixture. Sp. gr. ·845.—*Dose.* 1 to 2 fl. drs.

Pur., &c. Pure spirit of nitric ether boils at about 160° Fahr., scarcely reddens litmus paper, and "gives off no bubbles of carbonic acid gas on the addition of carbonate of soda." (Ph. L.) "When agitated with twice its volume of concentrated solution of chloride of calcium, 12⅖ of ether slowly separates." (Ph. E.)—*Dose.* ½ to 3 fl. drs., as a febrifuge, a diaphoretic, diuretic, antispasmodic, &c.; in various affections.

Obs. The mass of the sweet spirits of nitre of the shops is of very inferior quality, and is scarcely, if ever, made directly from spirit that has paid the duty. One, and a very large portion, is obtained from Scotland; another, from the manufacturers of fulminating mercury; and a third, and, in fact, the principal part, from certain persons in the neighbourhood of the metropolis who employ contraband spirit for its preparation, as this article is not under the excise. Recently methylated spirit has been employed for the purpose.

Sweet spirits of nitre, sp. gr. ·850, is now commonly and publicly sold, in quantity, at a price which is only about 2-3rds that of the spirit in it, if the latter had paid duty. The spirit obtained from the manufacturers of fulminating mercury frequently contains no inconsiderable quantity of hydrocyanic acid.

The mere admixture of nitric or hyponitrous ether with alcohol does not afford an officinal SPIR. ÆTHER. NITR., as this always contains aldehyde, which, according to Prof. Liebig, is an essential constituent of the officinal compound.

Spirit of Nitrous Ether. *Syn.* SPIRITUS ÆTHERIS NITROSI (B. P.). See SPIRIT OF NITRIC ETHER.

Spirit of Nut'meg. *Syn.* SPIRITUS MYRISTICÆ (B. P., Ph. L. & E.), S. NUCIS MOSCHATÆ, L. *Prep.* 1. (Ph. L. & E.) Bruised nutmegs, 2½ oz.; proof spirit, 1 gal.; water, 1 pint, or q. s.; distil a gallon. Cordial and carminative.—*Dose.* 1 to 4 fl. drs.; chiefly used to flavour mixtures and draughts.

2. (ESSENTIA MYRISTICÆ MOSCHATÆ—Ph. D.) Oil of nutmegs, 1 fl. oz.; rectified spirit, 9 fl. oz. *Used* in dispensing.

3. (B. P.) Volatile oil of nutmeg, 1; rectified spirit, 49; dissolve.—*Dose.* 30 to 60 minims.

Spirit of Pennyroy'al. *Syn.* SPIRITUS PULEGII (Ph. L.), S. MENTHÆ PULEGII, L. *Prep.* 1. (Ph. L.) Oil of pennyroyal, 3 fl. drs.; proof spirit, 1 gall.; dissolve. Stimulant, antispasmodic, and carminative.—*Dose.* ½ to 2 fl. drs.

2. (ESSENTIA MENTHÆ PULEGII—Ph. D.) Oil of pennyroyal, 1 fl. oz.; rectified spirit, 9 fl. oz. *Used* chiefly in dispensing.

Spirit of Pep'permint. *Syn.* SPIRITUS MENTHÆ PIPERITÆ (B. P., Ph. L.), S. MENTHÆ (Ph. E.), L. *Prep.* 1. (Ph. L.) Oil of peppermint, 3 fl. drs.; proof spirit, 1 gal.; dissolve.

2. (Ph. E.) Green peppermint, 1½ lb.; proof spirit, 7 pints; macerate 2 days; add of water, q. s., and distil 7 pints.—*Dose.* ½ to 2 drs.

3. (ESSENTIA MENTHÆ PIPERITÆ—Ph. D.) Oil of peppermint, 1 fl. oz.; rectified spirit, 9 fl. oz. See ESSENCE OF PEPPERMINT.

4. (B. P.) English oil of peppermint, 1; rectified spirit, 49; dissolve.—*Dose.* 30 to 60 minims, or, for children under five years, 1 to 3 minims.

Spirit of Pimen'to. *Syn.* SPIRIT OF ALLSPICE; SPIRITUS PIMENTÆ—Ph. L. & E.), L. *Prep.* 1. (Ph. L.) Oil of pimento, 2 fl. drs.; proof spirit, 1 gal.; dissolve.

2. (Ph. E.) From pimento, bruised, ½ lb., and proof spirit, 7 pints; as spirit of caraway. Carmative and stomachic.—*Dose.* 1 to 4 fl. drs.; in flatulent colic, dyspepsia, &c.

3. (ESSENTIÆ PIMENTÆ—Ph. D.) Oil of pimento, 1 fl. oz.; rectified spirit, 9 fl. oz. *Used* to make pimento water, and in dispensing.

Spirit of Pine-tops. *Syn.* SPIRITUS TURIONUM PINI, L. See RIGA BALSAM.

Spirit of Rose'mary. *Syn.* SPIRITUS ROSMARINI (B. P., Ph. L. & E.), L. *Prep.* 1. (Ph. L.) As SPIRIT OF PIMENTO.

2. (Ph. E.) Rosemary tops, 2½ lbs.; rectified spirit, 1 gall.; as SPIRIT OF LAVENDER. Fragrant and stimulant.

3. (ESSENTIA ROSMARINI—Ph. D.) As ESSENCE OF PIMENTO.

4. (B. P.) Oil of rosemary, 1; rectified spirit, 49; dissolve.—*Dose.* 10 to 30 minims.

Spirit of Spear'mint. *Syn.* SPIRITUS MENTHÆ VIRIDIS (Ph. L.), S. MENTHÆ SATIVÆ, L. *Prep.* 1. (Ph. L.) As SPIRIT OF PEPPERMINT—Ph. L.

2. (ESSENTIA MENTHÆ VIRIDIS—Ph. D.) As ESSENCE OF PEPPERMINT—Ph. D. The uses and doses are also the same.

Spirit of Sulphu'ric E'ther. See *page* 1072.

Spirit of Vitriol (Sweet). See AROMATIC SPIRIT OF ETHER (*above*).

Vul'nerary Spirit. *Syn.* VULNERARY WATER, ARQUEBUSADE; SPIRITUS VULNERARIUS, L.; EAU D'ARQUEBUSADE, Fr. *Prep.* 1. Dried tops of sage, wormwood, fennel, hyssop, marjoram, savory, thyme, rosemary, calamint, balm, peppermint, and scordium, fresh leaves of angelica and basil, and lavender flowers, of each, 4 oz.; proof spirit, 2 galls.; digest for 14 days, and distil over 1½ gal.

2. Rosemary leaves, 1½ lb.; leaves of thyme and summits of millefoil, of each, ½ lb.; juniper berries, 3 oz.; proof spirit, 2 galls.; distil over 5 quarts.

Obs. This preparation is stimulant and vulnerary, and is in great repute on the Continent as a cosmetic and cordial.

SPIRITS (Perfumed). *Syn.* SPIRITUS ODORIFERI, ODORES SPIRITUOSI, L. The odoriferous spirits of the perfumer are, for the most part, prepared from various aromatic and odorous substances, by a similar process to that described under ESSENCES and SPIRITS (Medicinal); but in this case a perfectly pure, flavourless, and scentless spirit must be employed. The distillation should also be preferably conducted by steam, or the heat of a water bath, and the distilled spirit should be kept for some time in a cellar, or other cold situation, previously to being used. When simple solution of an essential oil in the spirit is adopted, care should be taken that the oil is pale and new; or, at least, has not been much exposed to the air; as in that case it would contain resin, which would make the perfumed spirit, or essence, liable to stain delicate articles of clothing to which it may be applied. Most of the 'eaux' and 'esprits' of the perfumers are prepared by one or other of the above methods. It is found, however, that the perfumed spirits of some of the more delicate flowers cannot be well obtained by either infusion or distillation, or by the simple solution of their essential oils in spirit; or, at least, they are not usually so prepared by the foreign perfumers. The spirits of orange flowers, jasmin, tuberose, jonquille, roses, and of some other flowers, and of cassia, vanilla, &c., are commonly prepared by digesting pure rectified spirit for 3 or 4 days on half its weight of the respective pommades or oils, obtained by infusion or contact. The operation is performed in a closed vessel placed in a water bath, and frequent agitation is employed for 3 or 4 days, when the perfumed spirit is decanted into a second digester, containing a like quantity of oil to the first. The whole process is repeated a second and a third time, after which the spirit is allowed to settle and is then decanted. It now forms the most fragrant and perfect odoriferous spirit (extrait) of the Continental perfumer. The product is called 'esprit' or 'extrait of the first infusion.' The three portions of oil are then treated again with fresh spirit in the same manner, and thus spirits or essences of inferior quality are obtained, which are distinguished by the perfumers as No. 2, 3, 4, &c., or 'esprits' or 'extraits of the first, second, third, &c.,' operation or infusion. In some, though only a very few cases, the spirits are afterwards distilled.

The strength of the spirit for the concentrated essences should not be less than 56 o. p. (sp. gr. ·8376); that for eaux, esprits, and extraits, not less than 35 o. p. (sp. gr. ·8723). The strength of the second quality of the last three must be fully proof (sp. gr. ·920). See Alcohol, Distillation, Essence, Oils, Pommade, &c. and *below*.

Eau d'Ambre Royale. [Fr.] From essences of ambergris and musk, of each, 1 fl. oz.; spirit of ambrette and orange-flower water, of each, 1 pint; rectified spirit, 1 quart; mix.

Eau d'Ange. [Fr.] From flowering tops of myrtle (bruised), 1¼ lb.; rectified spirit, 7 pints; water, 3 pints; digest a week, add of common salt, 2 lbs., and distil 1 gal.

Eau d'Arquebusade. [Fr.] See *page* 1071.

Eau de Bouquet. [Fr.] From spirits of rosemary and essence of violets, of each, 1 fl. oz.; essences of bergamot and jasmin, of each 1 fl. dr.; oils of verbena and lavender, of each, ½ fl. dr.; orange-flower water, 1 fl. oz.; eau de rose, ½ pint; rectified spirit, 1 quart; mix.

Eau de Bouquet de Flore. [Fr.] From spirits of rosemary and roses and essence of violets, of each, ½ fl. oz.; oil of cedra and essence of ambergris, of each, 1 fl. dr.; orange-flower water, 5 fl. oz.; rectified spirit, 1 pint.

Eau des Carmes. [Fr.] See Spirit of Balm.

Eau de Cologne. [Fr.] *Syn.* Cologne water; Aqua Coloniensis, A. c. spirituosa, Spiritus Coloniensis, L. For the production of good eau de Cologne it is absolutely essential that the spirit be of the purest description, both tasteless and scentless, and that the oils be not only genuine, but recently distilled, as old oils are less odorous, and contain a considerable quantity of resin and camphor, which prove injurious. When flowers and the flowering tops of plants are ordered, it is also necessary that they be either fresh gathered or well preserved, without drying them. To produce an article of the finest quality, distillation should be had recourse to. A very excellent eau de Cologne may, however, be produced by simple solution of the oils or essences in the spirit, provided they be new, pale coloured, and pure. The mass of the eau de Cologne prepared in England, some of which possess the most delicate fragrance, and is nearly equal to the best imported, is made without distillation. In the shops two kinds of this article are generally kept—French and German. That prepared by Farina of Cologne is esteemed the best, and is preferred in the fashionable world.

Prep. 1. From essences of bergamot and lemon, of each, 1 fl. dr.; oil of orange, ½ dr.; oil of neroli, 20 drops; oil of rosemary, 10 drops; essence of ambergris and musk, of each 1 drop; rectified spirit, ½ pint; mix.

2. Essence of bergamot, 3 fl. oz.; essence of lemon, 3 fl. drs.; essence of cedrat, 2 fl. drs.; oils of neroli and rosemary, of each, 1½ fl. dr.; oil of balm, ½ fl. dr.; rectified spirit, 1½ gal.; mix.

3. (Cadet Gassincourt.) Take of pure neroli, essences (oils) of cedrat, orange, lemon, bergamot, and rosemary, of each, 24 drops; lesser cardamom seeds, ¼ oz.; spirit at 32° Beaumé (sp. gr. ·869), 1 quart; digest a few days, and then distil 1½ pint.

4. (Farina.) Take of rectified spirit, 5 galls.; calamus aromaticus, sage, and thyme, of each, ½ dr.; balm-mint and spearmint, of each, 1 oz.; angelica root, 10 grs.; camphor, 15 grs.; petals of roses and violets, of each, 3 drs.; lavender flowers, 1½ dr.; orange flowers, 1 dr.; wormwood, nutmeg, cloves, cassia lignea, and mace, of each, 20 grs.; oranges and lemons, sliced, of each, 2 in no.; bruise or slice the solids, macerate, with agitation, for 48 hours, then distil off 2-3rds, and add to the product—essences of lemon, cedrat, balm-mint, and lavender, of each, 1 fl. dr.; pure neroli and essence of the seeds of anthos, of each, 20 drops; essences of jasmine and bergamot, of each, 1 fl. oz.; mix well and filter, if necessary.

5. (P. Cod.) Oils of bergamot, lemon, and cedrat, of each, 3 oz.; oils of rosemary, laven-

der, and neroli, of each, 1½ oz.; oil of cinnamon, ¾ oz.; spirit of rosemary, 1 quart; compound spirit of balm (eau de melisse des Carmes), 3 pints; rectified spirit, 3 galls.; digest for 8 days, then distil 3 galls.

6. (Dr. A. T. Thomson.) Oils of bergamot, orange, and rosemary, of each, 1 fl. dr.; cardamom seeds, 1 dr.; rectified spirit and orange-flower water, of each, 1 pint; mix, digest for a day, and then distil a pint.

7. (Trommsdorff.) Oils of neroli, citron, bergamot, orange, and rosemary, of each, 12 drops; Malabar cardamoms, bruised, 1 dr.; rectified spirit of wine, 1 quart; mix, and, after standing 2 or 3 days, distil a quart.

Obs. Eau de Cologne is principally *used* as a perfume, but a very large quantity is consumed by fashionable ladies, as a cordial and stimulant. For this purpose it is dulcified with sugar. A piece of linen dipped in Cologne water, and laid across the forehead, is a fashionable remedy for headache.

Eau d'Elegance. [Fr.] From spirit of jessamine, 1 pint; rectified spirit and spirits of hyacinth and storax, of each, ½ pint; tinctures of star-anise and tolu, of each, 2 fl. oz.; tincture of vanilla, 1 fl. oz.; essence of ambergris, ½ dr.; mix, and in a week decant the clear portion.

Eau de Framboises. [Fr.] From strawberries, bruised, 16 lbs.; rectified spirit, 1 gal.; digest, and distil to dryness in a salt-water or steam bath.

Eau d'Heliotrope. [Fr.] From essence of ambergris, ½ fl. dr.; vanilla, ½ oz.; orange-flower water, ½ pint; rectified spirit, 1 quart; digest a week, and filter.

Eau d'Hongrie. [Fr.] *Syn.* HUNGARY WATER; AQUA HUNGARICA, SPIRITUS ROSMARINI COMPOSITUS, L.; EAU DE LA REINE D'HONGRIE, Fr. A fragrant stimulant and cosmetic. Sweetened with sugar, it is also *used* as a liqueur.

Prep. 1. Rosemary tops, in blossom, 4 lbs.; fresh sage, ½ lb.; bruised ginger, 2 oz.; rectified spirit, 1½ gal.; water, ½ gal.; macerate for 10 days, add of common salt, 3 lbs., and then distil 11 pints.

2. From oil of rosemary (genuine), 1½ fl. dr.; oil of lavender, ½ dr.; orange-flower water, ½ pint; rectified spirit, 1½ pint; mix. SPIRIT OF ROSEMARY (see *above*) is now commonly sold for it.

Eau d'Ispahan. [Fr.] From oil of the bitter orange, 2 fl. oz.; oil of rosemary, 2 drs.; oils of cloves and neroli, of each, 1 fl. dr.; oil of spearmint, ½ fl. dr.; eau de rose, 1 pint; rectified spirit, 7 pints; mix. It is better for distillation. *Used* as Eau de Cologne.

Eau de Jasmin. [Fr.] See ESPRIT DE JASMIN (*below*).

Eau de Lavande. [Fr.] *Syn.* LAVENDER WATER, DOUBLE DISTILLED L. W.; AQUA LAVANDULÆ, A. L. ODORIFERA, SPIRITUS L., L. *Prep.* 1. From the flowering tops of lavender (freshly and carefully picked), 7 lbs.; rectified spirit, 2 galls.; macerate for a week, add of water, ½ gal.; (holding in solution) common salt, 3 lbs., and distil 2 gallons.

2. From Mitcham oil of lavender, 8 oz.; essence of musk, 4 oz.; essence of ambergris and oil of bergamot, of each, 1½ oz.; rectified spirit, 2 gallons; mix well. Very fine.

3. (Brande.) Oil of lavender, 20 oz.; oil of bergamot, 5 oz.; essence of ambergris (finest), ½ oz.; rectified spirit, 5 galls.; mix.

Obs. The products of the last two formulæ are better for distillation; but in that case the essences of ambergris and musk should be added to the distilled spirit. The oils should be of the best quality, and newly distilled, and the spirit should be perfectly scentless.

It may be useful to observe here, that the common lavender water, double distilled lavender water, or spirit of lavender of the shops, is made with spirit at proof, or even weaker; hence its inferior quality to that of the more celebrated perfumers. 1 oz. of true English oil of lavender is all that will properly combine with 1 gal. of proof spirit, without rendering it muddy or cloudy.

Eau de lavande is a most agreeable and fashionable perfume. The article produced by the second formula, has received the commendation of her Majesty and many of the nobility.

Eau de Lavange (Ammoniacal). 1. To lavender water, 1 pint, add of liquor of ammonia, ½ fl. oz.

2. (P. Cod.) English oil of lavender, 1 oz.; spirit of ammonia, 2 lbs.; dissolve. *Used* as a stimulating scent in fainting. See PERFUMES (Ammoniated).

Eau de Lavande de Millefleurs. To each quart of the ordinary eau de lavender (Nos. 2 or 3), add of oil of cloves, 1½ fl. dr.; essence of ambergris, ½ fl. dr.

Eau de Luce. [Fr.] See TINCTURE OF AMMONIA.

Eau de Maréchale. [Fr.] *Syn.* EXTRAIT DE MARÉCHALE, Fr. 1. From ambergris and grain musk, of each, 20 grs.; oils of bergamot, lavender, and cloves, of each, 1 oz.; oils of sassafras and origanum, of each, ½ fl. dr.; rectified spirit, 2 quarts; macerate with agitation for a week.

2. Rectified spirit, 1 pint; essence of violets, 1 oz.; essences of bergamot and œillets, of each, ¼ oz.; orange-flower water, ½ pint; mix.

Eau de Melisse. [Fr.] See SPIRIT OF BALM.

Eau de Miel. [Fr.] *Syn.* HONEY WATER, SWEET-SCENTED H. W.; AQUA MELLIS, A. M. ODORIFERA, L. *Prep.* 1. Take of spirit of roses (No. 3—see *above*), 2 quarts; spirit of jasmin and rectified spirit, of each, 1 quart; essence of Portugal, 1 fl. oz.; essences of vanilla and musk, of each (No. 3), 4 fl. oz.; flowers of benzoin, 1½ dr.; mix, agitate, and add of eau de fleurs d'oranges, 1 quart. Delightfully fragrant.

2. Honey (finest), ¼ lb.; essence of bergamot,

½ oz.; essence of lemon, ¼ oz.; oil of cloves, 12 drops; musk, 12 grs.; ambergris, 6 grs.; orange-flower and rose water, of each, 1 quart; rectified spirit, 1 gal.; macerate for 14 days, with frequent agitation, and filter.

Obs. The last is often coloured with 20 or 30 grs. of saffron, and made into a ratafia with sugar. HONEY WATER FOR THE HAIR is a different article to the above. It is obtained by the dry distillation of honey, mixed with an equal weight of clean sand, a gentle heat only being employed. The product is yellowish, and acidulous, from the presence of acetic acid. This last is used to promote the growth of the hair.

Eau de Millefleurs. [Fr.] *Syn.* EXTRAIT DE MILLEFLEURS, Fr. *Prep.* 1. From grain musk, 12 grs.; ambergris, 20 grs.; essence of lemon, 1½ oz.; oils of cloves and lavender (English), of each, 1 oz.; neroli and oil of verbena, of each, ½ dr.; rectified spirits, 2 quarts; macerate in a closed vessel, and a warm situation, for a fortnight.

2. Balsam of Peru (genuine) and essence of cloves, of each, 1 oz.; essences of bergamot and musk, of each, 2 oz.; essences of neroli and thyme, of each, ¼ oz.; eau de fleurs d'oranges, 1 quart; rectified spirit, 9 pints; mix well. Very fine.

3. Essence of bergamot, ¼ oz.; eau de lavande and essence of jasmin, of each, 1 oz.; orange-flower water, 8 fl. oz.; rectified spirit, 1 pint; mix.

Eau de Mousselline. [Fr.] From eau de fleurs d'oranges and spirit of clove-gillyflower, of each, 1 quart; spirit of roses (No. 3—see *above*), spirit of jasmin (No. 4), and spirit of orange flowers (No. 4), of each, 2 quarts; essences of vanilla and musk, of each (No. 3), 2 fl. oz.; sanders wood, ½ oz. Very fine.

Eau de Naphe. [Fr.] See WATERS (Perfumed).

Eau Romain. [Fr.] From essence of ambergris, 1 fl. oz.; tincture of benzoin, 4 fl. oz.; spirit of tuberose, ½ pint; spirit of acacia flowers and tincture of vanilla, of each, 1 pint; spirit of jasmin, 3 pints; mix.

Eau de Rosieres. [Fr.] From spirit of roses, 1 pint; spirits of cucumber, angelica root, and celery seeds, of each, ½ pint; spirits of jasmin and orange flowers, of each, ¼ pint; tincture of benzoin, 2 fl. oz.; mix.

Eau sans Pareille. [Fr.] 1. From essence of bergamot, 5 drs.; essence of lemon, 8 drs.; essence of citron, 4 drs.; Hungary water, 1 pint; rectified spirit, 6 quarts; mix, and distil.

2. Grain musk, 20 grs.; ambergris, 25 grs.; oils of lavender and cloves, of each, 1 oz.; essence of bergamot, ½ oz.; oils of sassafras and origanum, of each, 20 drops; rectified spirit, 1 gal.; macerate for 14 days.

Eau de Violette. [Fr.] See ESPRIT DE VIOLETTES (*below*).

Esprit d'Ambrette. [Fr.] See ESSENCE (*page* 456).

Esprit de Bergamotte. [Fr.] From essence (oil) of bergamot (best), 5 oz.; essence of ambergris (pale), 2 fl. oz.; essence of musk, ½ fl. oz.; oil of verbena, 2 fl. drs.; rectified spirit, 1 gal.; mix.

Esprit de Bouquet [Fr.] From Mitcham oil of lavender, 1 oz.; oils of cloves and bergamot, of each, 3 fl. drs.; essence of musk, 1 fl. dr.; otto of roses, 10 drops; rectified spirit, 1 quart.

Esprit de Fleurs. [Fr.] See SPIRIT OF THE FLOWERS OF ITALY (*below*).

Esprit de Jasmin. [Fr.] *Syn.* EAU DE JASMIN, Fr. See *page* 1073.

Esprit de Jasmin Odorante. [Fr.] From spirit of jasmin and rectified spirit, of each, 1 pint; essence of ambergris, 1 fl. dr.

Esprit de Jonquille. [Fr.]

Esprit de la Reine. [Fr.] From oil of bergamot, 1 fl. oz.; essence of ambergris, 2 fl. drs.; otto of roses, 1 fl. dr.; rectified spirit, 1 quart.

Esprit de Rondeletia. [Fr.] *Syn.* EXTRAIT DE RONDELETIA, Fr. From Mitcham oil of lavender, 3 oz.; oil of cloves, 1½ oz.; oil of bergamot, 1 oz.; essences of musk and ambergris, of each, 2 fl. drs.; rectified spirit, 3 pints.

Esprit de Rose. [Fr.] 1. From spirit of roses (see general directions, *page* 1073), 1 pint; essence of ambergris and oil of rose-geranium, of each, ½ fl. dr.

2. From otto of roses, 2 drs.; neroli, ½ dr.; rectified spirit, 1 gal.; dissolve, add of chloride of calcium (well dried and in powder), 1½ lb.; agitate well, and distil 7 pints. Very fine.

Esprit de Suave. [Fr.] From the essences of cloves and bergamot, of each, 1½ fl. dr.; neroli, ½ fl. dr.; essence of musk, 1 fl. oz.; spirit of tuberose and rectified spirit, of each, 1 pint; spirits of jasmin and cassia, of each, 1 quart; dissolve, then add of eau de rose, 1 pint, and mix well.

Esprit de Tain. [Fr.] *Syn.* SPIRIT OF LEMON THYME; SPIRITUS THYMI, L. From tops of lemon thyme, 2 lbs.; proof spirit, 1 gal.; distil 7 pints.

Esprit de Violettes. [Fr.] *Syn.* SPIRIT OF VIOLETS, ESSENCE OF V., E. OF ORRIS. From Florentine orris root, reduced to coarse powder, ¼ lb.; rectified spirit, 1 pint; by simple maceration for a fortnight. A stronger and finer article (ESSENCE OF VIOLETS) is prepared from orris root, 5 lbs., to rectified spirit, 1 gal.; by percolation,

Extrait de Bouquet. [Fr.] Extract of nosegay.

Extrait de Maréchale. [Fr.] See *page* 1075.

Extrait de Millefleurs. [Fr.] See *above*.

Extrait de Rondeletia. [Fr.] See *above*.

Odeur Délectable. [Fr.] From oils of lavender, bergamot, rose-geranium, and cloves, of each 1 fl. dr.; eaux de rose and fleurs d'orange, of each, ¼ pint; rectified spirit, 1½ pint.

Odeur Suave. [Fr.] See ESPRIT (*above*).

Spirit of Cytherea. From the spirits of violets, tuberose, clove-gillyflower, jasmin (No. 2—see *above*), roses (No. 2), and Portugal, of each, 1 pint; orange-flower water, 1 quart; mix.

Spirit of the Flowers of Italy. *Syn.* ESPRIT DE FLEURS, Fr. From the spirits of roses (No. 1—see *above*), jasmin (No. 2), oranges (No. 3), and cassia (No. 2), of each, 4 pints; orange-flower water, 3 pints; mix.

Victoria Perfume. See ESPRIT DE LA REINE (*above*).

SPIT'TING OF BLOOD. See HÆMOPTYSIS.

SPONGE. *Syn.* SPONGIA, S. OFFICINALIS, L. Sponge is a cellular fibrous structure, produced by marine animals of the humblest type, belonging to the sub-kingdom Protozoa. The finest quality is imported from Smyrna, and is known as TURKEY SPONGE; another, called WEST INDIAN or BAHAMA SPONGE, is much less esteemed, being coarse, dark coloured, and very rotten.

Sponge, as collected, and also as generally imported, contains many impurities, more especially sand, most of which may be removed by beating it, and by washing it in water. Amusing disputes often arise between the smaller importers and the wholesale purchasers, on this subject—the privilege of beating it before weighing it, the number of minutes so employed, and even the size of the stick, being often made important matters in the 'haggling.'

BLEACHED SPONGE (WHITE SPONGE; SPONGIA DEALBATA) is prepared by soaking ordinary sponge in very dilute hydrochloric acid, to remove calcareous matter, then in cold water, changing it frequently, and squeezing the sponge out each time, and next, in water holding a little sulphuric or sulphurous acid, or, still better, a very little chlorine, in solution; the sponge is, lastly, repeatedly washed and soaked in clean water, scented with rose or orange-flower water, and dried.

BURNT SPONGE (SPONGIA USTA—Ph. D.) is prepared by heating the cuttings and unsaleable pieces in a closed iron crucible until they become black and friable, avoiding too much heat, and allowing the whole to cool before exposing it to the air. It was formerly in great repute in bronchocele and scrofulous complaints.—*Dose.* 1 to 3 drs., in water, or made into an electuary or lozenges.—When good, burnt sponge evolves violet fumes of iodine on being heated in a flask along with sulphuric acid.

COMPRESSED or WAXED SPONGE (SPONGIA CERATA, S. COMPRESSA) is sponge which has been dipped into melted wax, and then compressed between two iron plates until cold. When cut into pieces it forms 'SPONGE TENTS,' which are used by surgeons to dilate wounds.

SPOTS and STAINS.—1. OIL and GREASE SPOTS on boards, marble, &c., when recent, may be removed by covering them with a paste made of fuller's earth and hot water, and the next day, when the mixture has become perfectly dry, scouring it off with hot soap-and-water. For old spots, a mixture of fuller's earth and soft soap, or a paste made of fresh-slaked lime and pearlash, will be better; observing not to touch the last with the fingers.

2. RECENT SPOTS of OIL, GREASE, or WAX, on woollen cloth or silk, may be removed with a little clean oil of turpentine or benzol; or with a little fuller's earth or scraped French chalk, made into a paste with water, and allowed to dry on them. They may also be generally removed by means of a rather hot flat-iron and blotting-paper or spongy brown paper, more especially if the cloth, or one of the pieces of paper, be first slightly damped. OLD OIL and GREASE SPOTS require to be treated with ox-gall or yolk of egg, made into a paste with fuller's earth or soap. PAINT SPOTS, when recent, generally yield to the last treatment. Old ones, however, are more obstinate, and require some fuller's earth and soft soap made into a paste with either ox-gall or spirit of turpentine.

FRUIT and WINE STAINS, on linen, commonly yield easily to hot soap-and-water. If not, they must be treated as those below.

INK SPOTS and RECENT IRON MOULDS on washable fabrics may be removed by dropping on the part a little melted tallow from a common candle, before washing the articles; or, by the application of a little lemon juice, or of a little powdered cream of tartar made into a paste with hot water. Old ink spots and iron moulds will be found to yield almost immediately to a very little powdered oxalic acid, which must be well rubbed upon the spot previously moistened with boiling water, and kept hot over a basin filled with the same.

STAINS arising from ALKALIES and ALKALINE LIQUORS, when the colours are not destroyed, give way before the application of a little lemon juice; whilst those arising from the weaker acids and acidulous liquids yield to the fumes of ammonia, or the application of a little spirit of hartshorn or sal volatile.

STAINS OF MARKING INK may be removed by soaking the part in a solution of chloride of lime, and afterwards rinsing it in a little solution of ammonia or of hyposulphate of soda; or they may be rubbed with the tincture of iodine, and then rinsed as before. See BALLS, CLOTHES, HANDS, SCOURING, STAINS, &c.

SPRAIN. *Syn.* SUBLUXATIO, L. An injury of a joint, in which it has been strained or twisted in an unnatural manner, without actual dislocation. Pain, swelling, and inflammation, are the common consequences, which must be combated by purgatives, repose, and a low diet, with refrigerant lotions, or warm fomentations, according to circumstances. In extreme cases, blood should be taken. Where there is simple stiffness and weakness, exercise is often serviceable.

SPRAT. The *Clupea Sprattus* (Linn.), a small fish of the herring family, abounding on our coasts. Gutted, coloured, and pickled, it is sold for anchovies, or as British anchovies, and much used to make the sauce of that name.

SPRUCE. See Beer, Essence, and Powders.

SPUNK. See Amadou.

SQUILL. *Syn.* Scilla (B. P., Ph. L. E. & D.), L. The bulb of "*Urginea Scilla,*" sliced and dried. In small doses, squill acts as a stimulating expectorant and diuretic; in larger ones, as an emetic and purgative. With the first intention it is generally given in substance (powder), in doses of 1 to 3 or 4 grs.; with the latter, either made into vinegar or oxymel (which *see*). It is an excellent remedy in coughs, &c., after the inflammatory symptoms have subsided.

STAINED GLASS. The art of painting or staining glass resembles enamel painting, in the effect being produced by fluxing certain metallic substances, as oxides or chlorides, on its surface, by means of heat applied in a suitable furnace. The operations it embraces are difficult, and require great promptitude and experience to prove successful. The colours or compounds employed are, for the most part, similar to those noticed under Enamel and Paste.

STAINS. Discolourations from foreign matters. Liquid dyes are also frequently termed 'stains.' See Spots, &c., and *below*.

Stains, Blood. Spots of dried blood on wood, linen, &c., however old, are easily recognised by the microscope; but simple stains or marks of blood of a slight character, especially those occurring on iron or steel, are recognised with greater difficulty. To obviate this, H. Zollikofer adopts the following plan:—The spot is removed, by scraping, from the surface of the metal, and the resulting powder is digested in tepid water, when a liquid is obtained which exhibits the following reactions:—

1. The liquid is neutralised with acid, and heated to ebullition, when opalisation occurs, or a dirty red coagulum forms.

2. The coagulum is dissolved in hot liquor of potassa; the solution, if blood (hæmatin) be present, is diachromatic, or appears green by transmitted light and red by reflected light.

3. By the addition of concentrated chlorine water, in excess, to either solution, white flocks of albumen and chlorhæmatin separate, which are free from iron, as tested by sulphocyanide of potassium.

Obs. The last two reactions are said to be characteristic. Very old spots must be boiled in water containing a little liquor of potassa. See Dr. Taylor's 'Medical Jurisprudence.'

Stains, Bookbinder's. See Leather, Marbling, &c.

Stains, Confectioner's. These are similar to those noticed under Liqueur. Mineral colours, especially mineral blues, greens, and yellows, must on no account be used, as they are nearly all dangerous poisons; nor is there any inducement to use them, since the vegetable substances referred to afford, by proper management, every shade that can be possibly required. These stains are also used for cakes and pastry.

Stains, Liqueur. See Liqueur.

Stains, Map. See Maps, Velvet Colours, &c.

STAM′MERING. *Syn.* Blæsitas, L. Occasionally, this depends on some organic affection, or slight malformation of the parts of the mouth or throat immediately connected with the utterance of vocal sounds; but, much more frequently, it is a habit resulting from carelessness, or acquired from example or imitation. When the latter is the case, it may be generally removed by perseveringly adopting the plan of never speaking without having the chest moderately filled with air, and then only slowly and deliberately. Hasty and rapid speaking must not be attempted until the habit of stammering is completely subdued. Nervous excitement and confusion must be avoided as much as possible, and the general health attended to, as circumstances may direct. This variety of stammering is commonly distinguished by the person being able to sing without hesitation. Stammering depending on elongation of the uvula, and other like causes, may be generally removed by a simple surgical operation.

STAN′NIC ACID. Peroxide of tin.

STARCH. $C_6H_{10}O_5$. *Syn.* Amylaceous fecula; Amylum, L. One of the most important and widely diffused of the proximate principles of vegetables, being found, in greater or less quantity, in every plant. The mealy and farinaceous seeds, fruits, roots, and the stem-pith of certain trees, consist chiefly of starch in a nearly pure state. Wheat contains about 75% and potatoes about 15% of this substance. From these sources the fecula is obtained by rasping or grinding to pulp the vegetable structure, and washing the mass upon a sieve, by which the torn cellular tissue is retained, whilst the starch passes through with the liquid, and eventually settles down from the latter as a soft, white, insoluble powder, which, after being thoroughly washed with cold water, is dried in the air, or with a very gentle heat.

Wheat starch (Amylum, B. P., Ph. L. E. & D.) is commonly prepared by steeping the flour in water for a week, or a fortnight, during which time the saccharine portion ferments and the starch-granules become freed, for the most part, from the glutinous matter which envelopes them, by the disintegrating and solvent action of the lactic acid generated by the fermentation. The sour liquor is then drawn off, and the feculous residue washed on a sieve; what passes through is allowed to settle, when the liquid is again drawn off, and the starch thoroughly washed from the slimy matter; it is then drained in perforated boxes, cut up into square lumps, placed on porous bricks to absorb the moisture, and, lastly, air or stove dried.

In the preparation of starch from potatoes (potato starch) and other like vegetable substances, the roots or tubers, after being washed and peeled, either by hand-labour or by machinery, are rasped by a revolving grater, and the pulp washed on hair sieves until freed from feculous matter. Successive portions of the pulp are thus treated until the vessel over which the sieves are placed, or into which the washings run, is sufficiently full. The starch held in suspension in the water having subsided to the bottom, the water is drawn off, and the starch stirred up with fresh water, and again allowed to subside. This operation is repeated several times, with fresh water, until the starch is rendered sufficiently pure for commercial purposes, when it is washed and dried as before. The waste fibres and the washing waters are used as manure. (See ARROW-ROOT.)

In the manufacture of starch from rice and Indian corn (rice starch, maize starch), a very dilute solution of caustic soda, containing about 200 grs. of alkali to each gallon of liquid, is employed to facilitate the disintegration and separation of the gluten and other nitrogenised matters. A weak solution of ammonia, or sesquicarbonate of ammonia, is also similarly employed with advantage. The gluten may be recovered by saturating the alkali with dilute sulphuric acid. Such starch does not require boiling, and is less apt than wheat starch to attract moisture from the atmosphere. Most of the so-called 'wheaten starch' of commerce used by laundresses is now prepared from rice.

To whiten the starches made from damaged roots and grains, and the coarser portions of those from sound ones, a little solution of chloride of lime is occasionally added to the water, followed by another water containing a very little dilute sulphuric acid; every trace of the last being afterwards removed by the copious use of pure soft or spring water.

The bluish-white starch used by laundresses is coloured with a mixture of smalts and alum in water, and is regarded as unfit for medicinal purposes.

Prop., *&c.* Starch is insoluble in cold water, and in alcohol and most other liquids, but it readily forms a gelatinous compound (amidin) with water at about 175° Fahr.; alcohol and most of the astringent salts precipitate it from its solutions; infusion of galls throws down a copious yellowish precipitate, containing tannic acid, which is redissolved by heating the liquid; heat and dilute acids convert it into dextrin and grape sugar; strong alkaline lyes dissolve it, and ultimately decompose it. Sp. gr. 1·53.

To the naked eye it presents the appearance of a soft, white, and often glistening powder; under the microscope it is seen to be altogether destitute of crystalline structure, but to possess, on the contrary, a kind of organisation, being made of multitudes of little rounded transparent bodies, upon each of which a series of depressed parallel rings, surrounding a central spot or hilum, may be traced. The starch-granules from different plants vary both in magnitude and form. Those of potato-starch and canna starch (tous les mois) are the largest, and those of rice and millet starch the smallest, the dimensions raging from $\frac{1}{360}$ to the $\frac{1}{10000}$ of an inch. The granules of arrow-root and tous les mois are ovoid, those of potato starch both oblong and circular, those of tapioca muller-shaped, and those of wheat starch circular.

Identif. One of the commonest frauds practised upon the profession and the public is the admixture of the cheaper kinds of starch, chiefly potato farina, with arrow-root, and vending manufactured for genuine tapioca, sago, and other articles of diet, used for invalids and children. These sophistications are most easily detected with a good microscope.[1]

Starch, I'odide of. *Syn.* AMYLI IODIDUM, AMYLI IODATUM, L. *Prep.* (Ph. Castr. Ruthena.) Iodine, 24 grs.; rectified spirit, a few drops; rub them to a powder; then add of starch, 1 oz., and again triturate, until the mass assumes a uniform colour. Recommended by Dr. A. Buchanan, of Glasgow, as producing the alterative effects of iodine, without the usual irritant action of that medicine.—*Dose.* A teaspoonful, or more, in water-gruel, or any bland liquid, twice or thrice a day.

STARCHING (Clear). Muslins, &c., are 'clear-starched' or 'got-up' by laundresses in the following manner:—Rinse the articles in three waters, dry them, and dip them into thick made-starch, which has been previously strained through a piece of muslin; squeeze them, shake them gently, and again hang them up to dry; when they are dry, dip them twice or thrice into clear water, squeeze them, spread them on a linen cloth, roll them up in it, and let them lie an hour before ironing them. Some persons put a morsel of sugar into the starch, to prevent its sticking whilst ironing, and others stir the starch with a candle to effect the same end; both these practices are as injurious as unnecessary. The best plan to prevent sticking is simply to use the best starch, and to make it well, and to have the irons quite clean and highly polished. Mr. W. B. Tegetmeier recommends the addition of a small piece of paraffin (a piece of paraffin candle-end) to the starch, to increase the glossiness of the ironed fabric.

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[1] The measurements and microscopical appearances of all the commercial starches will be found accurately described and figured in Royle's "*Manual of Materia Medica*."

STAVES'ACRE. *Syn.* Stavesacre seeds; Staphisagriæ semina, Staphisagria (Ph. L. & D.), L. "The seed of *Delphinium Staphisagria*, Linn." (Ph. L.) This article is powerfully emetic and cathartic, but is now scarcely ever used internally. Mixed with hair powder, it is used to kill lice. An infusion, or ointment, made with it is said to be infallible in itch, but its use requires some caution.

STARS. (In pyrotechny.) *Prop.* 1. (Brilliant—Marsh.) Nitrate, 52½ parts; sulphur and black antimony, of each, 13 parts; reduce them to powder, make them into a stiff paste with isinglass, 1½ part, dissolved in a mixture of vinegar, 6½ parts, and spirits of wine, 13 parts; lastly, form this into small pieces, and, whilst moist, roll them in meal gunpowder.

2. (White—Ruggieri.) Nitre, 16 parts; sulphur, 7 parts; gunpowder, 4 parts; as the last.

3. (Golden rain.)—*a.* (Ruggieri.) Nitre and gunpowder, of each, 16 parts; sulphur, 10 parts; charcoal, 4 parts; lampblack, 2 parts; mix, and pack it into small paper tubes.

b. (Ruggieri.) Nitre, 16 parts; sulphur and gunpowder, of each, 8 parts; charcoal and lampblack, of each, 2 parts; as the last.

c. (Marsh.) Mealed gunpowder, 66⅔ parts; sulphur, 11 parts; charcoal, 22¼ parts; as before. *Used* for the 'garniture' of rockets, &c.

STAYS. *Syn.* Corset. Stays, "before womanhood, are instruments of barbarity and torture, and then they are needed only to give beauty to the chest. It is the duty of every mother, and every guardian of children, to inquire the purpose for which stays were introduced into female attire. Was it for warmth? If so, they certainly fulfil the intention very badly, and are much inferior to an elastic woollen habit, or one of silk quilted with wool. Was it to force the ribs, while yet soft and pliable, into the place of the liver and stomach, and the two latter into the space allotted for other parts, to engender disease and deformity to the sufferer and her children for generations? Truly, if this were the object, the device is most successful, and the intention most ingeniously fulfilled." (Eras. Wilson.)

"Only observe," exclaimed Dr. John Hunter, "only observe, if the statue of the Medicean Venus were to be dressed in stays, and her beautiful feet compressed into a pair of execrably tight shoes, it would extort a smile from an Heraclitus, and a horse-laugh from a Cynic."

"The Turkish ladies express horror at seeing Englishwomen so tightly laced." (Lady M. W. Montague.)

The practice of tight-lacing has happily gone out of fashion since the remarks above quoted were made.

STEAM. The application of steam of the laboratory, as a source of heat, is commonly effected by means of double pans, to the space between which steam, at a moderate pressure, is introduced, the arrangements being such as to permit of the condensed steam, or distilled water, being removed, by means of a cock, nearly as soon as formed, or as may be desirable. Another plan is to place coils of metal pipe along the bottom of cisterns, vats, &c., formed either of wood or metal, and to keep them supplied with high-pressure steam.

"It is quite susceptible of positive proof that by no arrangement yet discovered, can more than two thirds of the heat generated by a given quantity of coal, during combustion, be fairly absorbed and utilised in any of our manufactories; and, moreover, there are undeniable facts, which demonstrate that seldom, in the burning of coal, are more than three fourths of the total heat, which might be eliminated, actually obtained; thus justifying the supposition that one half of all the coal now consumed is virtually wasted, and lost to society." To lessen, as much as possible, this loss, various improvements have been made, which, "for the most part, have consisted in lengthening the flues, and exposing a larger surface of the boiler to the action of the heated air passing from the furnace to the chimney." "Remembering that air is an extremely bad conductor of heat, and that water about to be converted into steam is also a bad conductor, it is evident that time must form an important element in the perfect transmission of heat from one of these to the other; and hence, with a great velocity of current existing in the flues, very little heat would pass from air, however high its temperature, to water contained in a boiler, and so circumstanced with respect to its all but gaseous condition." The results of the experiments on fuel made at the Museum of Practical Geology by Sir H. de la Beche and Dr. Lyon Playfair, go clearly to show that, "to open the damper of a steam-boiler furnace is pretty generally to diminish the effective power of the fuel." "Great waste of coal now arises from this simple circumstance; and much of the heat of the fire, which ought to go to the boiler, is lost by its (too) hasty transmission up the chimney. If, however, there be thus far room for improvement in the direction just indicated, still wider is the vacant space, caused by imperfect combustion, or, in technical phrase, 'bad stoking,' merely because the stoker, to economise his labour, and to avoid trouble, throws on to the bars of his furnace a thick layer of fuel, by which loss is caused in two or three directions." These are, principally, imperfect combustion, and the volatilisation of fuel, as smoke, &c., from an insufficient supply of air, and from a mass of mere red-hot coke or cinder, two or three inches thick, lying between the boiler and the hottest part of the furnace; which last, according, to Dr. Kennedy, is about one inch above the fire-bars. Besides which, "in passing over this red-hot coke, the carbonic acid would be converted into carbonic oxide, and thus not only remove a quantity of carbon equal to its own, without yielding any additional heat, but actually with the production of cold, or, in other words, the absorption of heat." ('Dict. Arts, Manuf., and Mines.') This points to the evident policy of using a smoke-consuming furnace, as noticed elsewhere.

Another matter worthy of remark, is the constant waste of heat, and, consequently, of fuel, in laboratories and manufactories in which steam is employed, owing to the exposed condition of the pipes, boilers, and pans. All of these should be well 'clothed' or covered by some non-conducting medium, to prevent loss of heat by radiation, and by contact with the atmosphere. Not only does economy dictate such a course, but the health and comfort of the workpeople demand that the atmosphere in which they labour should be as little heated and poisoned as possible.

TABLE *of corresponding Pressure and Temperatures of Steam.* By **ARAGO** and **DULONG.**

Pressure in Atmospheres.[1]	Temperature, Fahr.	Pressure in Atmospheres.[1]	Temperature, Fahr.
	Degrees.		Degrees.
1	212·	13	380·66
1½	234·	14	386·94
2	250·5	15	392·86
2½	263·8	16	398·48
3	275·2	17	403·83
3½	285·	18	408·92
4	293·7	19	413·78
4½	300·3	20	418·46
5	307·5	21	422·96
5½	314·24	22	427·28
6	320·36	23	431·42
6½	326·26	24	435·56
7	331·7	25	439·34
7½	336·86	30	457·16
8	341·78	35	472·73
9	350·78	40	486·59
10	358·88	45	499·14
11	366·85	50	510·6
12	374·		

A cubic inch of water, during its conversion into steam, under the ordinary pressure of the atmosphere, expands into 1696 cubic inches, or nearly a cubic foot.

One part, by weight, of steam, at 212° Fahr., when condensed into cold water, is found to be capable of raising 5·6 parts of the latter from the freezing- to the boiling-point. See FUEL, PIT-COAL, SMOKE, &c.

STEAR'IC ACID. $HC_{18}H_{35}O_2$. *Syn.* STEARIN (Commercial). This is obtained from stearin (see *below*), by saponification.

Prep. 1. Repeatedly dissolve and crystallise commercial stearic acid in hot alcohol, until its melting-point becomes constant at not less than 158° Fahr. Pure.

2. (Chevreul.) Saponify mutton suet with caustic potassa, and dissolve the newly formed soap in 6 times its weight of hot water; to the solution add 40 or 50 parts of cold water, and set the mixture aside in a temperature of about 52° Fahr.; after a time separate the pearly matter (stearate and margarate of potassa) which falls, drain and wash it on a filter, and dissolve it in 24 parts of hot alcohol of sp. gr. ·820; collect the stearate of potassa which falls as the liquid cools, recrystallise it in alcohol, and decompose it, in boiling water, with hydrochloric acid; lastly, wash the disengaged stearic acid in hot water, and dry it.

3. (Commercial.) Ordinary tallow is boiled in large wooden vessels, by means of high-pressure steam, with about 16% of hydrate of lime (equiv. to 11% of pure lime), for 3 or 4 hours, or until the combination is complete, and an earthy soap is formed, when the whole is allowed to cool; the product (stearate of lime) is then transferred to another wooden vessel, and decomposed by adding to it 4 parts of oil of vitriol (diluted with water) for every 3 parts of slaked lime previously employed, the action being promoted by steam heat and brisk agitation; after repose, the liberated fat is decanted from the sediment (sulphate of lime) and water, and is then well washed with water, and by blowing steam into it; it is next allowed to cool, when it is reduced to shavings by means of a number of knives worked by machinery, and in this divided state is placed in canvas bags and submitted to the action of a powerful hydraulic press, by which a large portion of the oleic acid which it contains is expelled; the pressed cakes are then a second time exposed to the action of steam and water, again cooled, and coarsely powdered, and again submitted to the joint action of steam and pressure; they are, lastly, melted, and cast into blocks for sale.

Obs. This product is a more or less impure mixture of stearic acid and other fatty bodies, particularly the so-called margaric acid, now generally regarded as a mixture of palmitic and stearic acids. The hard fatty acids of vegetable origin (palmitic, cocinic, myristic, &c.), now so extensively used as candle materials, are obtained from the natural oils and butters by the process known as 'sulphuric acid saponification,' which consists in treating the fatty bodies with 5 or 6% of concentrated sulphuric acid at a high temperature (about 350° Fahr., produced by superheated steam), and distilling the resulting mass by the aid of steam heated to about 560° Fahr. Frequently the operations of hot and cold pressing are resorted to in order to free the product from the softer fats.

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[1] Estimating 14·6 lbs. = 1 atmosphere.

By a patent process employed at Price's candle works the natural vegetable fats are decomposed into their constituents (fatty acids and glycerin) by the action of superheated steam alone, without previous 'saponification,' with lime or sulphuric acid.

Prop., &c. Pure stearic acid crystallises in milk-white needles, which are soluble in ether and in cold alcohol, and form salts with the bases, called stearates. The commercial acid is made into candles. See CANDLES, FAT, OILS (Fixed), and TALLOW.

STE'ARIN. $C_{57}H_{110}O_6$. The solid portion of fats which is insoluble in cold alcohol.

Prep. Pure strained mutton suet is melted in a glass flask along with 7 or 8 times its weight of ether, and the solution allowed to cool; the soft, pasty, semi-crystalline mass is then transferred to a cloth, and is strongly pressed as rapidly as possible, in order to avoid unnecessary evaporation; the solid portion is then redissolved in ether, and the solution allowed to crystallise, as before. The product is nearly pure.

Prop., &c. White; semi-crystalline; insoluble in water and cold alcohol; soluble in 225 parts of cold ether, and freely so in boiling ether. It melts at 130° Fahr. The stearin of commerce is stearic acid.

STEAROP'TEN. The name given by Herberger to the concrete portion or camphor of volatile oils. Bizio calls it stereusin.

STEEL. This important material may be defined as iron chemically combined with sufficient carbon to give it extreme toughness and hardness without brittleness. According to one of our greatest authorities on metallurgy, steel should contain from ·833% to 1·67% of carbon, these numbers referring respectively to the softest and the hardest varieties. Within the last few years great attention has been paid to the investigation of the chemistry of steel. The researches of Despretz and Fremy tend to the conclusion that nitrogen exercises a very important influence over the phenomena of 'steeling,' and that carbon plays a less necessary part; while those of Caron and Deville still refer the formation of steel to the chemical combination of iron with carbon. The processes for converting iron into steel, and for 'tempering' steel articles, cannot be described in a work like the present.

There is no test of the value of steel beyond its elasticity and temper, and the fineness, equality, and smoothness of its grain.[1]

STE'REOTYPE METAL. See TYPE METAL.

STER'LING. The truth of the old proverb, that "all is not gold which glitters," is often painfully experienced by the purchaser of modern jewelry. The following table will, therefore, prove highly useful to the reader in determining the value of articles in gold, provided he ascertain the 'fineness' of the metal, either by examination or written warranty:—

Sterling value of Gold of different degrees of 'Fineness.'

Carats. Fine.		Value per oz. Troy.		
		£	s.	d.
24	*carats*	4	4	11½
23	"	4	1	5
22	" (*British standard*)	3	17	10½
21	"	3	14	4
20	"	3	10	9½
19	"	3	7	3
18	" (*lowest Hall-mark*)	3	3	8½
17	"	3	0	2
16	"	2	16	7½
15	"	2	13	1
14	"	2	9	6½
13	"	2	6	0
12	"	2	2	5½
11	"	1	18	11
10	"	1	15	4½
9	"	1	11	10
8	"	1	8	3½
7	"	1	4	9
6	"	1	1	2½
5	"	0	17	8
4	"	0	14	2
3	"	0	10	7½
2	"	0	7	1
1	"	0	3	6½

STER'RO-METAL. A remarkable alloy recently invented by Baron de Rosthorn, of Vienna, and used in place of ordinary gunmetal. It consists of copper and spelter, with small proportions of iron and tin, and to these latter its peculiar hardness, tensile strength, and elasticity, are attributed.

STETH'OSCOPE. An instrument employed in auscultation. It consists of a tube (usually made of wood, sometimes of gutta percha) widening considerably at one end, and but slightly at the other. The wide end is applied to the chest or other part of the patient, the physician putting his ear at the other end; and from the sounds emitted by the heart, lungs, &c., the state of these parts is ascertained.

STEW'ING. A method of cooking food intermediate to frying and boiling, performed by simmering it in a saucepan or stewpan, with merely sufficient water to prevent burning, and to effect the object in view; the whole being served up to form the 'dish.' It is undoubtedly the most simple and economical, and, when skilfully conducted, one of those best calculated to develop the flavour and nutritious qualities of animal food. The following is one of the most popular stews:—

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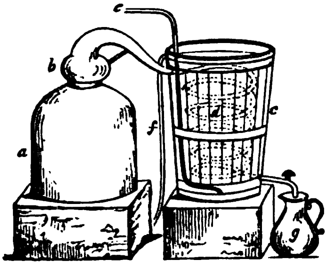
[1] For full information respecting the manufacture of steel, refer to Dr. Percy's elaborate treatise on "*Metallurgy—Iron and Steel.*"

Stew, Irish. *Prep.* (Soyer.) Take about 2 lbs. of scrag or neck of mutton; divide it into ten or twelve pieces, and lay them in the pan; add 8 large potatoes and 4 onions cut into slices, season with 1½ teaspoonful of pepper, and 3 do. of salt; cover all with water, put it into a slow oven, or on a stove, for two hours, then stir it all up well, and serve it up in deep dishes. If a little more water is added at the commencement, you can take out, when half done, a nice cup of broth.

STILL. A vessel or apparatus employed for the distillation of liquids on the large scale. The forms of stills, and the materials of which they are made, vary according to the purposes for which they are intended, some being exceedingly simple, whilst others are equally elaborate and complicated. The *engr.* represents the most common and useful apparatus of this kind, and the one almost exclusively employed in the laboratory. It is used as follows:—After the fluid and other matters (if any) are put into the still, the head is placed on and connected with the worm-tub or refrigerator, and the joints are all securely luted. For ordinary liquids, a stiff paste made with linseed meal and water, to which a little chalk may be added, answers well for this purpose. For corrosive liquids, nothing is better than elastic bands or rings interposed between the joints, which are then 'brought home,' as it is called, with screws or clamps. Heat is next applied, and the worm tub is supplied with cold water in sufficient quantity to preserve its contents at a proper temperature; the application of the heat being so regulated that the liquid may drop from the end of the refrigerator quite cold and unaccompanied with vapour. For highly volatile liquids a closed receiver should be provided.



a. Body of still, which may be either placed in a steam jacket or in a brick furnace.
b. Still head or capital.
c. Worm tub.
d. Pewter worm, or refrigerator.
e. Cold water pipe.
f Waste pipe.
g. Receiver.

STIM'ULANTS. *Syn.* STIMULANTIA, L. Medicines or agents which possess the power of exciting vital action. They are divided into general stimulants, or those which affect the whole system, as mercury or bark; and local or topical stimulants, or those which affect a particular organ or part only, as mustard applied as a poultice. Diffusible stimulants are general stimulants the effects of which are rapid but fugacious, as ether or alcohol. "Much discrimination and caution are required in the administration of articles of this class, because, if given when inflammation is present, they are liable to create more mischief than benefit; but they are called for when, on the decline of that condition of an organ or organs, a state of relaxation or torpidity exists. In this state of things, a gentle stimulation materially assists the functions, and is productive of much benefit."

STIR-ABOUT. Thick gruel formed of oatmeal and water boiled together. When eaten with cold milk, it forms the porridge of the Scotch; and when mixed with the liquor in which meat or vegetables have been boiled, it is called beef brose, kale brose, &c.

STOCK. Among cooks, is condensed soup or jelly, *used* to make extemporaneous soup, broth, &c.

STOM'ACH AFFEC'TIONS. Those of a character to admit of being usefully noticed in a popular work are referred to under the heads APPETITE, DYSPEPSIA, SICKNESS, &c.

Dr. Budd recommends small doses of ipecacuanha as a remedy for those cases of indigestion in which digestion is slow, and the food lies heavily on the stomach, and there is an inability for mental or bodily exertion for some time after meals. He says it should be given in the morning, fasting, and in quantity barely sufficient to occasion a slight feeling of vermiculating motion in the stomach, but without causing any sensation of pain or nausea. The dose to produce this effect varies from ¼ to 2 grs. He thinks there is no other medicine which appears so effectual in removing the affections in question. Small doses of rhubarb, ginger, and cayenne pepper, have a similar kind of action, and may be given singly or together for the same purpose. "I generally prescribe from ½ to 1 gr. of ipecacuanha, in a pill, with 3 or 4 grs. of rhubarb. With many, a favourite remedy for the discomfort resulting from slow digestion is a grain of cayenne paper, with 3 or 4 grs. of rhubarb. The best time for giving these medicines is shortly" (say ½ an hour) "before any meal after which a sense of oppression is usually felt."

STOP'PERS, when obstinately immovable in bottles, are the most safely treated by patiently hitting them upwards alternately on opposite sides with a piece of wood. When this fails, the part may be dipped into hot water.

STORM-GLASS. A philosophical toy, consisting of a thin glass tube about 12 inches long and ¾ inch in diameter, about three fourths filled with the following liquid, and covered with a brass car having an almost capillary hole through it, or else tied over with bladder.

The solution. Take of camphor, 2 drs.; nitre, 1½ dr.; sal ammoniac, 1 dr.; proof spirit, 2½ fl. oz.; dissolve, and place it in the tube above referred to. *Used* to foretell changes of the weather.

STRABIS'MUS. *Syn.* SQUINTING. This need not be described. When one eye only is affected, an excellent plan is to blindfold the sound eye during several hours each day, until the affection be removed. When both eyes are affected, a projecting piece of pasteboard, in the line of the nose, may be worn as much as possible with the same object. In bad cases of squinting inwards, as it is called, the division of the internal rectus muscle of the eyeball, by a skilful surgeon, is said to often relieve the deformity.

STRAP'PING. Spread adhesive plaster. *Used* to dress wounds, &c.

STRASS. See ENAMEL.

STRAW'BERRY. *Syn.* FRAGARIA, L. The fruit of *Fragaria vesca* (Linn.), or strawberry plant. Strawberries are, perhaps, the mildest of all the cultivated fruits; they are cooling, and slightly laxative and diuretic; rubbed on the teeth, they dissolve the tartar, and whiten them. They were formerly in repute in gout, stone, and consumption. The root of the plant is aperient.

STRAW PLAIT, and the articles made of it, are bleached by exposing them to the fumes of burning sulphur in a close chest or box; or, by immersing them in a weak solution of chloride of lime, and afterwards well washing them in water. Water acidulated with oil of vitriol or oxalic acid is also used for the same purpose. Straw plait may be dyed with any of the simple liquid dyes.

STRON'TIUM. Sr. The metallic base of the earth strontia. It was discovered by Sir H. Davy, in 1808. It closely resembles barium, but is less lustrous. With chlorine it combines to form chloride of strontium, a somewhat deliquescent salt, soluble in 2 parts of cold and in less of boiling water, and freely soluble in alcohol. With oxygen it forms an oxide.

Test. Strontium salts are precipitated by sulphuric acid and alkaline carbonates and sulphate. They are distinguished from barium by not giving such a decided precipitate with sulphates, and by not being precipitated by bichromate of potassium. From calcium, by sulphates of calcium solution giving a precipitate, and by concentrated solutions giving a precipitate with chromate of potassium. It is distinguished from magnesium by the insolubility of its sulphate.

Strontium, Oxide of. SrO. *Syn.* PROTOXIDE OF STRONTIUM, STRONTIA. *Prep.* Quite pure crystalline nitrate of strontium. *Prop.* Grayish-white powder, uniting with water to form a white, somewhat soluble substance, the hydrate of strontium, $Sr(HO)_2$.

With acids it forms various salts, of which the carbonate is a white insoluble powder, and the nitrate a white crystalline salt, soluble in 5 parts, of cold water, and in alcohol, communicating a brilliant red colour to flame.

STROPH'ULUS. A papular eruption peculiar to infants. There are several varieties:—In strophulus intertinctus, red gum, or red gown, the pimples rise sensibly above the level of the cuticle, possess a vivid red colour, and are usually distinct from each other; they commonly attack the cheeks, forearm, and back of the hand, and, occasionally, other parts of the body.—In strophulus albidus, or white gum, there are a number of minute whitish specks, which are, sometimes, surrounded by a slight redness. The two preceding varieties commonly occur during the first two or three months of lactation.—In strophulus confertus, rank red gum, or tooth rash, which usually appears about the fourth or fifth month, the pimples usually occur on the cheeks and sides of the nose, sometimes on the forehead and arms, and still less frequently on the loins. They are smaller, set closer together, and less vivid, but more permanent than in the common red gum.—In strophulus volaticus small circular patches or clusters of pimples, each containing from 6 to 12, appear successively on different parts of the body, accompanied with redness; and as one patch declines another springs up near it, by which the efflorescence often spreads gradually over the whole face and body.—In strophulus candidus the pimples are larger than in the preceding, and are pale, smooth, and shining; it principally attacks the upper parts of the arms, the shoulders, and the loins. The last two varieties commonly appear between the third and ninth month.

The *treatment* of the above affections consists chiefly in removing acidity and indigestion, and duly regulating the bowels by an occasional dose of magnesia or rhubarb, or both combined. Diarrhœa may be met by the warm bath and the daily use of arrow-root (genuine), to which a teaspoonful or two of pure port wine has been added; and itching and irritation may be alleviated by the use of a lotion consisting of water, to which a little milk, lemon juice, borax, or glycerin, has been added.

STRYCH'NINE. $C_{21}H_{22}N_2O_2$. *Syn.* STRYCHNINA, STRYCHNIA (B. P., Ph. L. E. & D.), L. *Prep.* 1. Dissolve hydrochlorate or sulphate of strychnine in distilled water, and throw down the alkaloid with ammonia, carefully avoiding excess; redissolve the precipitate in hot rectified spirit, and collect the crystals which form as the liquid cools.

2. (Ph. D.) Nux vomica (in powder), 1 lb., is digested for 24 hours in ½ gal. of water acidulated with 2 fl. drs. of sulphuric acid, after which it is boiled for half an hour, and the decoction decanted; the residuum is boiled a second and a third time with a fresh ½ gal. of water acidulated with 1 fl. dr. of the acid, and the undissolved matter is finally submitted to strong expression; the decoctions are next filtered and concentrated to the consistence of a syrup, which is boiled with rectified spirit, 3 pints, for about 20 minutes, hydrate of calcium,

1 oz., or q.s., being added in successive portions during the ebullition, until the solution becomes distinctly alkaline; the liquid is then filtered, the spirit distilled off, and the residuum dissolved in diluted sulphuric acid, q.s.; ammonia, in slight excess, is added to the filtered solution, and the precipitate which falls is collected upon a paper filter, and dried; it is next redissolved in a minimum of boiling rectified spirit, and digested with ¼ oz. of animal charcoal for 20 minutes; the filtered liquid, as it cools, deposits strychnine, in crystals.

Prop. A white, inodorous, infusible powder; or small, but exceedingly brilliant, transparent, colourless, octahedral crystals; soluble in about 7000 parts of water at 60°, and in 2500 parts at 212° Fahr.; freely soluble in hot rectified spirit; insoluble in absolute alcohol, ether, and solutions of the caustic alkalies; imparts a distinctly bitter taste to 600,000 times its weight of water (1 part in 1,000,000 parts of water is still perceptible—Fownes); exhibits an alkaline reaction; and forms salts with the acids, which are easily prepared, are crystallisable, and well defined.

Tests.—1. Potassium hydrate and the carbonate produce, in solutions of the salts of strychnia, white precipitates, which are insoluble in excess of the precipitant, and which, when viewed through a lens magnifying 100 times, appear as aggregates of small crystalline needles. In weak solutions the precipitate only separates after some time, in the form of crystalline needles, which are, however, in this case, perfectly visible to the naked eye.—2. Ammonia gives a similar precipitate, which is soluble in excess of the precipitant.—3. Bicarbonate of sodium produces, in neutral solutions, a like white precipitate, which is insoluble in excess, but which redissolves on the addition of a single drop of acid; in acid solutions no precipitate occurs for some time, in the cold, but immediately on boiling the liquid.—4. Nitric acid dissolves pure strychnia and its salts to colourless fluids, which become yellow when heated. Commercial strychnine,| from containing a little brucine, is reddened by this test.—5. A minute quantity of strychnine being mixed with a small drop of concentrated sulphuric acid, placed on a white capsule or slip of glass, forms a colourless solution, but yields, on the addition of a very small crystal of bichromate of potassium, or a very minute portion of chromic acid, a rich violet colour, which gradually changes to red and yellow, and disappears after some time. The $\frac{1}{1000}$th of a grain yields very distinct indications.—6. Pure oxide or peroxide of lead produces a similar reaction to the last, provided the sulphuric acid contain about 1% of nitric acid.

Pois. The characteristic symptom is the special influence exerted upon the nervous system, which is manifested by a general contraction of all the muscles of the body, with rigidity of the spinal column. A profound calm soon succeeds, which is followed by a new tetanic seizure, longer than the first, during which the respiration is suspended. These symptoms then cease, the breathing becomes easy, and there is stupor, followed by another general contraction. In fatal cases these attacks are renewed, at intervals, with increasing violence, until death ensues. One phenomenon which is only found in poisonings by substances containing strychnine is, that touching any part of the body, or even threatening to do so, instantly produces the tetanic spasm.

Treat. The stomach should be immediately cleared by means of an emetic, tickling the fauces, &c. To counteract the asphyxia from tetanus, &c., artificial respiration should be practised with diligence and care. "If the poison has been applied externally, we ought immediately to cauterise the part, and apply a ligature tightly above the wound. If the poison has been swallowed for some time, we should give a purgative clyster, and administer draughts containing sulphuric ether or oil of turpentine, which in most cases produce a salutary effect. Lastly, injections of chlorine and decoction of tannin are of value."

According to Ch. Gunther, the greatest reliance may be placed on full doses of opium, assisted by venesection, in cases of poisoning by strychnia or nux vomica. His plan is to administer this drug in the form of solution or mixture, in combination with a saline aperient.

Uses, &c. It is a most frightful poison, producing tetanus and death in very small doses. Even $\frac{1}{24}$ gr. will sometimes occasion tetanic twitchings in persons of delicate temperament. ¼ gr. blown into the throat of a small dog produced death in 6 minutes. In very minute doses it acts as a useful tonic in various nervous diseases, chronic diarrhœa, leucorrhœa, &c.; in slightly larger ones, it has been advantageously employed in certain forms of paralysis, in tic douloureux, impotence, &c.—*Dose* $\frac{1}{24}$ to $\frac{1}{16}$ gr. (dissolved in water by means of a drop of acetic or hydrochloric acid), gradually and cautiously increased until it slightly affects the muscular system. Eternally, ⅛ to ¼ gr. at a time.

The Edinburgh College ordered the nux vomica to be exposed for two hours to steam, to soften it, then to chop or slice it, next to dry it by the heat of a vapour bath or hot air, and, lastly, to grind it in a coffee-mill. In the process of the Ph. L. 1836 magnesia was employed to effect the precipitation. In the last Ph. L. strychnine appears in the Materia Medica. Most of that of commerce is now obtained from St. Ignatius's bean, which, according to Geiseler, yields 1¼% of it; whereas 3 lbs. of nux vomica produce little more than 1 dr. Commercial strychnine may be freed from brucine by digesting the powder in dilute alcohol.

The salts of strichnine, which are occasionally asked for in trade, are the acetate (strychniæ acetas), hydrochlorate or muriate (s. murias—Ph. D.), hydriodate (s. hydriodas), nitrate (s. nitras), phosphate (s. phosphas), and sulphate (s. sulphas). All of these may be easily formed by simply neutralising the acid previously diluted with 2 or 3 parts of water, with the alkaloid, assisting the solution with heat; crystals are deposited as the liquid cools, and more may be obtained by evaporating the mother-liquor.

STUC'CO. The name of several calcareous cements or mortars. Fine stucco is the third or last coat of three-coat plaster, and consists of a mixture of fine lime and quartzose sand, which, in application, is "twice hand-floated and well trowelled."

STUFFING. Seasoning, placed in meat, poultry, game, &c., before dressing them, to give them an increased relish. The same materials, formed into balls, are added to soups, gravies, &c., under the name of Force-meat.

Prep. 1. (For fowls, &c.) Shred a little ham or gammon, some cold veal or fowl, some beef suet, a small quantity of onion, some parsley, a very little lemon peel, salt, nutmeg, or pounded mace, and either white pepper or cayenne, and bread crumbs; pound them in a mortar, and bind it with 1 or 2 eggs.

2. (For hare, or anything in imitation of it—Mrs. Rundell.) The scalded liver, an anchovy, some fat bacon, a little suet, some parsley, thyme, knotted marjoram, a little shalot, and either onion or chives, all chopped fine; with some crumbs of bread, pepper, and nutmeg, beaten in a mortar with an egg.

3. (For goose.) From sage, onion, suet, and crumb of bread. Geese are now, however, more commonly stuffed with veal stuffing.

4. (For veal—Soyer.) Chop ½ lb. of suet, put it into a basin with ¾ lb. of bread crumbs, a teaspoonful of salt, a ¼ do. of pepper, a little thyme or lemon peel chopped, and 3 whole eggs; mix well.

Obs. 1 lb. of bread crumbs and one more egg may be used; they will make it cut firmer. This, as well as No. 1, is now commonly employed for poultry and meat. Ude, a great authority in these matters, observes that "it would not be amiss to add a piece of butter, and to pound the whole in a mortar." "Grated ham or tongue may be added to this stuffing." (Rundell.) This is also used for turkeys, and for 'forcemeat patties.'

STUFFING (Birds, &c.). The skins are commonly dusted over with a mixture of camphor, alum, and sulphur, in about equal quantities; or, they are smeared with *Bécœur's arsenical soap*, noticed at *page* 1049. According to Crace Calvert, carbolic acid, which is worth only about 2s. per. gal., is superior to all other substances for preserving the skins of birds and animals, as well as corpses.

STUR'GEON. Several species of *Acipenser* pass under this name. The common sturgeon is the *Acipenser sturio* (Linn.). The roe is made into 'caviare,' the swimming-bladder into 'isinglass.'

STY. *Syn.* Stye, Stian; Hordeolum, L. A small inflamed tumour, or boil, at the edge of the eyelid, somewhat resembling a barley-corn. It is usually recommended to promote its maturation by warm applications, since "the stye, like other furunculous inflammations, forms an exception to the general rule, that the best mode in which inflammatory swellings can end in resolution."

STYP'TICS. *Syn.* Styptica, L. Substances which arrest local bleeding. Creasote, tannic acid, alcohol, alum, and most of the astringent salts, belong to this class.

Styptic, Brocchieri's. A nostrum consisting of the water distilled from pine tops.

Styptic, Eaton's. A solution of sulphate disguised by the addition of some unimportant substances. "Helvetius's styptic was for a long time employed under this title." (Paris.)

Styptic, Helvetius's. *Syn.* Stypticum Helvetii, L. Iron filings (fine), and cream of tartar, mixed to a proper consistence with French brandy. See Helvetius's Styptic Powder (*page* 979).

STY'RAX. *Syn.* Storax, Storax balsam; Styrax (Ph. L. & E.), L. "The liquid balsam of an uncertain plant." (Ph. L.) The "balsamic exudation of *Styrax officinale*, Linn." (Ph. E.), or cane storax tree. Two or three varieties are known in commerce:—Liquid storax (*styrax liquida*), lump or red storax (*s. in massis*), which is generally very impure; storax in tears (s. in lachrymis), and storax in reeds (s. calamita). The last are now seldom met with in trade.

Prepared storax (*styrax colata; s. præparata* (B. P., Ph. L.) is obtained by dissolving storax, 1 lb., in rectified spirit, 4 pints, by a gentle heat, straining the solution through linen, distilling off greater part of the spirit, and evaporating what is left to a proper consistence by the heat of a water bath. It is less fragrant than the raw drug.

Storax is stimulant, expectorant, and nervine. It was formerly much used in menstrual obstructions, phthisis, coughs, asthmas, and other breath diseases. It is now chiefly used as a perfume.—*Dose.* 6 to 20 or 30 grs. (10 to 20 grs. twice a day, B. P.).

A factitious strained Storax is made as follows:—1. Balsam of Peru, 1 lb.; balsam of tolu, 4 lbs.; mix.

2. Gum benzoin, 8 lbs.; liquid storax, 6 lbs.; balsam of tolu and Socotrine aloes, of each, 3 lbs.; balsam of Peru, 2 lbs.; N. S. W. yellow gum, 7 lbs.; rectified spirit, 7 galls.; digest, with frequent agitation, for a fortnight, strain and distil off the spirit (about 5½ galls.) until the residuum has a proper consistence. *Prod.* 28 lbs.

3. Liquid storax, 1 oz.; Socotrine aloes, ½ lb.; balsam of tolu, 2 lbs.; rectified spirit, q. s.

SUB-. See Nomenclature and Salts.

SU'BERIC ACID. Obtained by boiling rasped cork for some time in nitric acid.

SUBLIMA'TION. The process by which volatile substances are reduced to the state of vapour by heat, and again condensed in the solid form. It differs from ordinary distillation in being confined to dry solid substances, and in the heat employed being, in general, much greater.

SUB'STANTIVE COLOURS. In the art of dyeing, are such as impart their tints to cloth and yarns without the intervention of a mordant; in contradistinction to adjective colours, which require to be fixed by certain 'intermedes,' or substances which have a joint affinity for the colouring matter and the material to be dyed.

SUCCIN'IC ACID. $C_4H_4O_4H_2$. *Syn.* ACIDUM SUCCINICUM. *Prep.* From amber, in coarse powder, mixed with an equal weight of sand, and distilled by a gradually increased heat; or from the impure acid obtained during the distillation of oil of amber; the product in both cases being purified by wrapping it in bibulous paper, and submitting it to strong pressure, to remove the oil, and then resubliming it.

From malic acid, by fermentation, or by digestion with hydriodic acid in sealed tubes.

Prop., &c. Colourless; inodorous (when pure); crystallises in oblique rhombic prisms; soluble in 5 parts of cold and in 2¼ parts of boiling water; fusible and volatile, without decomposition. Its salts are called 'succinates,' most of which are soluble. Succinate of ammonium is used as a test for iron. Succinic acid is distinguished from benzoic acid by its greater solubility, and by giving a brownish or pale red bulky precipitate with ferric chloride in neutral solutions; whereas that with benzoic acid is paler and yellower.

Uses, &c. Succinic acid is antispasmodic, stimulant, and diuretic, but is now seldom used.—*Dose.* 5 to 15 grs.

SUC'CORY. Chicory, or wild endive. (See CHICORY.)

SUDORIF'ICS. See DIAPHORETICS.

SU'ET. *Syn.* SEVUM, SEBUM, L. This is prepared from the fat of the loins of the sheep or bullock by melting it by a gentle heat, and straining the liquid fat. In this state it forms the ADEPS OVILLUS (Ph. D.), SEVUM (Ph. L. & E.), SEVUM OVILLUM, or SEVUM PRÆPARATUM, employed in medicine and perfumery, as the basis of ointments, cerates, plasters, pommades, &c.

Suet, Mel'ilot. *Syn.* SEVUM MELILOTI, L. *Prep.* From suet, 8 lbs.; melilot leaves, 2 lbs.; boil until the leaves are crisp, strain, and allow it to cool very slowly, so that it may 'grain well.' Used by farriers, and to make melilot plaster.

SUFFOCA'TION. The treatment varies with the cause. See ASPHYXIA, CHARCOAL, DROWNING, HANGING, SULPHURETTED HYDROGEN, &c.

SUG'AR. $C_{12}H_{22}O_{11}$. *Syn.* CANE SUGAR; SACCHARUM, L.; SUCRE, Fr. This well-known and most useful substance is found in the juice of many of the canes or grasses, in the sap of several forest trees, and in the roots of various plants. In tropical climates it is extracted from the sugar-cane (*Saccharum officinarum*), in China from the sweet sorgho (*Sorghum saccharatum*), in North America from the sugar-maple (*Acer saccharinum*), and in France from white beet-root (*Beta vulgaris*, var. *alba*). The ordinary sugar used in England is extracted from the sugar-cane which is raised so abundantly in our numerous colonies.

The manufacture of sugar is exclusively conducted on the large scale. The recent canes are crushed between rollers, and the expressed juice is suffered to flow into a suitable vessel, where it is slowly heated to nearly the boiling-point, to coagulate albuminous matter. A small quantity of milk of lime is then added, to remove mechanical impurities, and the skimmed and clarified juice, after being sufficiently concentrated by rapid evaporation in open pans, is transferred to coolers, and thence into upright casks perforated at the bottom, and so placed that the syrup, or uncrystallisable portion, may drain off into a tank or cistern from the newly formed sugar. During the period of crystallisation it is frequently agitated, in order to hasten the change, and to prevent the formation of large crystals. The solid portion of the product forms moist, raw, or muscovado sugar; the uncrystallisable syrup, molasses or treacle.[1]

Raw sugar is refined by redissolving it in water, adding to the solution albumen, under the form of serum of blood or white of egg, and, sometimes, a little lime-water, and heating the whole to the boiling-point; the impurities are then removed by careful skimming, and the syrup is decoloured by filtration through recently burnt animal charcoal; the clear decolorised syrup is next evaporated to the crystallising-point in vacuo, and at once transferred into conical earthern moulds, where it solidifies, after some time, to a confusedly crystallised mass; this, when drained, washed with a little clean syrup, and dried in a stove, constitutes ordinary loaf, lump, or refined sugar. When the crystallisation is allowed to take place quietly and slowly, the product is sugar candy. The evaporation at a low temperature in vacuum-pans has the effect ot diminishing the yield of treacle.

Prop. Sugar requres for its solution only 1-3rd of its weight of cold and still less of boiling water; it is slowly dissolved by cold rectified spirit; it dissolves in 4 parts of boiling rectified spirit and in 80 parts of boiling absolute alcohol; it melts by heat, and cools to a glassy amorphous mass (barley sugar); at about 400° Fahr. it suffers rapid decomposition, and fuses to a brown, uncrystallisable mass (caramel); long boiling with water increases its colour, and lessens its tendency to crystallise; its aqueous solution dissolves alkalies, earths, and many metallic oxides, with facility; weak syrups take up about half as much hydrate of calcium as they contain sugar; when slowly crystallised, it assumes the form of oblique 4-sided prisms, terminated by 2-sided summits. Sp. gr. 1·60 (1·577—Ure).

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[1] The term 'molasses' is usually restricted to the drainings from raw sugar, and 'treacle' to the thicker syrup which has drained from refined sugar in the moulds.

Pur. 1. Moist or muscovado sugar and crushed lump sugar are occasionally adulterated with chalk, plaster, sand, potato-flour, and other fecula; but frequently, and in certain neighbourhoods constantly, with starch sugar or potato-sugar. These frauds may be detected as follows:—

Tests.—1. Pure cane sugar dissolves freely and entirely in both water and proof spirit, forming transparent colourless solutions, which are unaffected by either sulphuretted hydrogen or dilute sulphuric acid.—2. Its solution bends the luminous rays in circumpolarisation to the right, whereas grape and fecula sugars bend it to the left.—3. (Chevallier.) Boiled for a short time in water containing 2 or 3⅝ of caustic potassa, the liquid remains colourless; but it turns brown, which is more or less intense, according to the quantity, if starch sugar is present. Even 2 or 3⅝ of starch sugar may be thus detected.—4. (E. Krantz.) A filtered solution of 33 grs. of cane or beet sugar in 1 fl. oz. of water, mixed with 3 grs. of pure hydrate of potassium, and then agitated with 1¼ gr. of sulphate of copper in an air-tight bottle, remains clear, even after the lapse of several days; but if starch sugar be present, a red precipitate is formed after some time; and if it is present in considerable quantity, the copper will be wholly converted into oxide within 24 hours, the solution turning first blue or green, and then entirely losing its colour.—5. (Trommer's test.) A solution of cane sugar is mixed with a solution of sulphate of copper, and hydrate of potassium added in excess; a blue liquid is obtained, which, on being heated, is at first but little altered; a small quantity of red powder falls after a time, but the liquid long retains its blue tint. When grape sugar or fecula sugar is thus treated, the first application of heat throws down a copious greenish precipitate, which rapidly changes to scarlet, and eventually to dark red, leaving a nearly colourless solution. This is an excellent test for distinguishing the two varieties of sugar, or discovering an admixture of grape sugar with cane sugar. The $\frac{1}{1000}$th part of grape sugar may be thus detected. The proportion of oxide of copper produced affords a good criterion, not only of the purity of the sugar, but also of the extent of the adulteration.—6. (Ure.) Dissolve a little sulphate of copper (say 20 grs.) in a measured quantity of water, and add to it, in the cold, a solution of hydrate of potassium, until, by testing with turmeric paper, the liquid appears faintly alkaline, shown by the paper becoming slightly brown. If a small quantity of this test-liquor (previously well shaken) be added to an aqueous solution of the sugar, and the whole boiled, the solution becomes at first green, and then olive-green, if dextrin is present; but if it contain grape sugar, the salt of copper is immediately reduced into the state of orange and oxide; whilst a solution of pure sugar undergoes no change, or is scarcely altered. —7. The presence of the inspissated sweet waste liquor (crude glycerin) of the stearin manufactories, now a common adulterant, may be detected by the inferior sweetness and by the moist and 'sickly' appearance of the sugar.—8. The specific gravities and crystalline forms offer other means of distinguishing the varieties of sugar.

Concluding remarks.—Refined sugar (SACCHARUM—Ph. L., S. PURUM—Ph. E., S. PURIFICATUM—Ph. D.), raw sugar (S. COMMUNE —Ph. E.), and molasses or treacle (SACCHARI FÆX—Ph. L. & E.), were officinal.

The relative sweetening power of cane sugar is estimated at 100; that of pure grape sugar, at 60; that of fecula or starch sugar, at 30 to 40.

According to Messrs. Oxland's method (patented 1849) of defecating and bleaching the juice of beet-root, cane, &c., acetate of aluminium, formed by dissolving 4 lbs. of that earth in acetic acid, is boiled with each ton of sugar, and as soon as the acetic acid is nearly all driven off, a solution of tannin, formed from 1 lb. of bruised valonia and 2 galls. of hot water, is added to the boiling sprup; the excess of aluminium is afterwards separated by lime, and the usual method of further procedure adopted. By their second patent (1851), superphosphate of aluminium or of calcium is substituted for acetate of aluminium, in the proportion of about 6 lbs. of aluminium, dissolved in phosphoric acid, for each ton of sugar.

Sugar may be obtained from nearly all sweet vegetable substances, by a process essentially similar to that described above.

Sugar, Al'um. *Syn.* SACCHARUM ALUMINATUM, ALUMEN SACCHARINUM, L. From alum and white sugar, in fine powder, equal parts, formed into minute sugar-loaf shaped lumps with mucilage of gum arabic made with rose water. Used to make astringent lotions and eye-waters.

Sugar, Bar'ley. *Syn.* SACCHARUM HORDEATUM, PENIDIUM, SACCHARUM PENIDIUM, L. *Prep.* Take of saffron, 12 grs.; hot water, q. s.; sugar, 1 lb.; boil to a full 'candy height,' or that state called 'crack,' or 'crackled sugar,' when 2 or 3 drops of clear lemon juice or white vinegar must be added, and the pan removed from the fire and set for a single minute in cold water, to prevent its burning; the sugar must be then at once poured out on an oiled marble slab, and either cut into pieces or rolled into cylinders, and twisted in the usual manner. 1 drop of oil of citron, orange, or lemon, will flavour a considerable quantity. White barley sugar is made with a strained decoction of barley instead of water, or starch is added to whiten it.

Sugar, Beet-root. *Syn.* SACCHARUM BETÆ, L. Sugar obtained from the white beet. (See *above.*) It is identical with cane sugar.

Diabet′ic Sugar. Grape sugar found in the urine of persons labouring under diabetes. In *diabetes insipidus* a substance having the general properties of a sugar, but destitute of a sweet taste, appears to be produced. (Thénard.)

Sugar, Gel′atin. See GLYCOCINE.

Sugar, Grape, $C_6H_{12}O_6 . H_2O$. *Syn.* GLUCOSE, FRUIT SUGAR; SACCHARUM UVÆ, S. FRUCTUS, L. This substance is found in the juice of grapes and other fruit, in the urine of diabetic patients, and in the liquid formed by acting on starch and woody fibre with dilute sulphuric acid.

Prep. 1. From the juice of ripe grapes or an infusion of the ripe fruit (raisins), by saturating the acid with chalk, decanting the clear liquid, evaporating to a syrup, clarifying with white of egg or bullock's blood, and then carefully evaporating to dryness; it may be purified for chemical purposes by solution and crystallisation in either water or boiling alcohol. Like other sugar, it may be decoloured by animal charcoal.

2. From honey, by washing with cold alcohol, which dissolves the fluid syrup and leaves the solid crystallisable portion.

Prop. It is less sweet and less soluble than cane sugar, requiring 1¼ part of cold water for its solution; instead of bold crystals, it forms granular warty masses, without distinct crystalline faces; it does not easily combine with either oxide of calcium or oxide of lead; with heat, caustic alkaline solutions turn it brown or black, but it dissolves in oil of vitriol without blackening, the reverse being the case with cane sugar; with chloride of sodium it forms a soluble salt, which yields large, regular, and beautiful crystals. Sp. gr. 1·400.

Obs. Cane sugar is converted into grape sugar during the process of fermentation, and by the action of acids. See SUGAR (*page* 1087) and STARCH SUGAR (*below*).

Sugar, Maple. *Syn.* SACCHARUM ACERINUM, L. From the juice of the sugar maple. The average product from each tree is about 6 lbs. per season. It is identical with cane sugar. (See *page* 1087.)

Sugar, Milk. $C_{12}H_{22}O_{11} . H_2O$. *Syn.* SUGAR OF MILK, LACTIN; SACCHARUM LACTIS (Ph. D.), L. *Prep.* Gently evaporate clarified whey until it crystallises on cooling, and purify the crystals by digestion with animal charcoal and repeated crystallisations.

Prop, &c. White, translucent, very hard, cylindrical masses or four-sided prisms; soluble in about 6 parts of cold and in 2 parts of boiling water; it is unsusceptible of the vinous fermentation, except under the action of dilute acids, which convert it into grape sugar; in solution, it is converted into lactic or butyric acid by the action of caseine and albuminous matter. Milk contains about 5% of it. (Boussingault.)

Obs. Sugar of milk is chiefly imported from Switzerland. In this country it is chiefly used as a vehicle for more active medicines, especially among the homœopathists.

Sugar, Starch. *Syn.* POTATO SUGAR, FÆCULA S. This is grape sugar obtained by the action of diastase on starch, in the manner noticed under GUM (British), or by the action of dilute sulphuric acid on starch, or of the strong acid on lignin, or on substances containing it.

Prep. 1. Potato starch, 100 parts; water, 400 parts; sulphuric acid, 6 parts; mix, boil for 35 or 40 hours, adding water, to make up for evaporation; then saturate the acid with lime or chalk, decant or filter, and evaporate the clear liquor. Under pressure, the conversion is more rapid. *Prod.* 105%.

2. Shreds of linen or paper, 12 parts; strong sulphuric acid, 17 parts (Braconnot; 5 of acid, and 1 of water—Vogel); mix in the cold; in 24 hours dilute with water, and boil it for 10 hours; then neutralise with chalk, filter, evaporate to a syrup, and set the vessel aside to crystallise. *Prod.* 114%. Sawdust, glue, &c., also yield grape sugar by like treatment. See LIGNIN.

SUGAR-BOILING. The art or business of the confectioner or sugar-baker; the candying of sugar. The stages are as follow:—Well clarified and perfectly transparent syrup is boiled until a 'skimmer' dipped into it, and a portion 'touched' between the forefinger and thumb, on opening them, is drawn into a small thread, which crystallises and breaks. This is called a 'weak candy height.' If boiled again, it will draw into a larger string, and if bladders may be blown through the 'drippings' from the ladle, with the mouth, it has acquired the second degree, and is now called 'bloom sugar.' After still further boiling, it arrives at the state called 'feathered sugar.' To determine this re-dip the skimmer, and shake it over the pan, then give it a sudden flirt behind, and the sugar will fly off like feathers. The next degree is that of 'crackled sugar,' in which state the sugar that hangs to a stick dipped into it, and put directly into a pan of cold water, is not dissolved off, but turns hard and snaps. The last stage of refining this article reduces it to what is called 'carmel sugar,' proved by dipping a stick first into the sugar, and then into cold water, when, on the moment it touches the latter, it will, if matured, snap like glass. It has now arrived at a 'full candy height.' Care must be taken throughout that the fire is not too fierce, as, by flaming up against the sides of the pan, it will burn and discolour the sugar; hence the boiling is best conducted by steam heat.

Any flavour or colour may be given to the candy by adding the colouring matter to the syrup before boiling it, or the flavouring essences when the process is nearly complete. See STAINS, &c.

SUGAR CAN′DY. *Syn.* SACCHARUM CANDIDUM, S. CRYSTALLINUM, S. CRYSTALLIZATUM, L. Sugar crystallised by leaving the saturated syrup in a warm place (90 to 100° Fahr.), the shooting being promoted by placing sticks, or threads, at small distances from each other in the liquor; it is also deposited from compound syrups, and does not seem to retain much of the foreign substances with which they are loaded. Brown sugar candy is prepared in this way from raw sugar; white do., from refined sugar; and red do., from a syrup of refined sugar which has been coloured red by means of cochineal.

Sugar candy is chiefly used as a sweetmeat; and, being longer in dissolving than sugar, in coughs, to keep the throat moist; reduced to powder, it is also blown into the eye, as a mild escharotic in films or dimness of that organ.

SUGAR OF LEAD. Acetate of lead.

SUGAR PLUMS. *Syn.* BON-BONS, DRAGÉES, Fr. These are made by various methods, among which are those noticed under DROPS (Confectionery), LOZENGES, and PASTILS, to which may be added the following:—Take a quantity of sugar syrup, in the proportion to their size, in that state called a 'blow' (which may be known by dipping the skimmer into the sugar, shaking it, and blowing through the holes, when parts of light may be seen), and add a drop or two of any esteemed flavouring essence. If the 'bon-bons' are preferred white, when the sugar has cooled a little, stir it round the pan till it grains and shines on the surface. When all is ready, pour it through a funnel into little clean, bright, leaden moulds, which must be of various shapes, and be previously slightly moistened with oil of sweet almonds; it will then take a proper form and harden. As soon as the plums are cold, take them from the moulds; dry them for two or three days in the air, and put them upon paper. If the bon-bons are required to be coloured, add the colour just as the sugar is ready to be taken off the fire.

CRYSTALLISED BON-BONS are prepared by dusting them with powdered double-refined lump sugar before drying them.

LIQUEUR BON-BONS, now so beautifully got up by the Parisian confectioners, are obtained by pressing pieces of polished bone or metal into finely powdered sugar, filling the hollow spaces so formed with saturated solutions of sugar in the respective liqueurs, and then spreading over the whole an ample layer of powdered sugar. In the course of three or four days the bon-bons may be removed, and tinted by the artist at will. Instead of white powdered sugar ordered above, coloured sugar may be used. These bon-bons are found to be hollow spheres, containing a small quantity of the spirit or liqueur employed, and will bear keeping for many months. See SWEETMEATS, &c.

SUGARS (Medicated). *Syn.* SACCHARIDES; SACCHARA MEDICATA, L.; SACCHAROLÉS, SACCHARURES, Fr. Some of these are prepared by moistening white sugar with the medicinal substance, then gently drying it, and rubbing it to powder; in other cases they are obtained in the manner noticed under PULVERULENT EXTRACTS, or OLEOSACCHARUM. The most valuable preparation of this class in British pharmacy is the saccharated carbonate of iron (FERRI CARBONAS CUM SACCHARO—Ph. L.).

SUL′PHATE. *Syn.* SULPHAS, L. A salt of sulphuric acid.

SUL′PHIDE. A salt consisting of sulphur and a metal or other basic radical.

SULPHINDYL′IC ACID. *Syn.* SULPHINDIGOTIC ACID. An intensely blue pasty mass, formed by dissolving 1 part of indigo in about 15 parts of concentrated sulphuric acid. See SULPHATE OF INDIGO.

SUL′PHITE. A salt of sulphurous acid.

SULPHOCARBOLIC ACID. (SULPHOCARBOLATES.) Carbolic acid, when acted upon by bases, yields a class of salts termed carbolates. These compounds are very unstable; they readily absorb water from the air, which sets free carbolic acid; they usually have the powerful odour of the latter. When, however, equivalent weights of carbolic and sulphuric acids are mixed, union takes place, a definite double acid (sulphocarbolic) results, and the salts formed by this double acid with the various bases are entirely different from the simple salts of carbolic acid. They are very stable, very soluble, possess neither odour nor taste of carbolic acid, and are singularly beautiful in crystalline form.

Sulphocarbolic Acid $[HC_6H_3SO_4]$ is obtained by the crystallisation in long colourless needles; unlike carbolic acid, it is soluble in water, alcohol, and ether, in any proportions.

Sulphocarbolate of Sodium $[Na(C_6H_5)SO_4.Aq]$ is in brilliant, clear, rhombic prisms. The salt is very soluble in water. This salt can be administered as a medicine in doses of 20 to 60 grs.; it is slowly decomposed in the textures, carbolic acid being evolved. It thus becomes a very simple means of obtaining the beneficial effects of the administration of this antiseptic without the difficulties and dangers which attend it in its uncombined irritant and caustic form. It has proved of great service in the treatment of infectious diseases. Administered in the severest cases of diphtheria, malignant scarlet fever, typhoid, erysipelas, &c., the remedy has proved of extreme value.

The Sulphocarbolates of Potassium $[KC_6H_5SO_4]$ **and Ammonium** $[NH_4C_6H_5SO_4]$ are also brilliant crystals; they are freely soluble, administered with the greatest ease, and have been used with success as remedial agents.

Sulphocarbolate of Calcium [$Ca(C_6H_5SO_4)_2 + Aq.$] is obtained in very long, fine, densely interlacing crystals, which form in bulk, by their interlacement, a porous mass. Unlike the usual lime-salts, this is exceedingly soluble. This fact overcomes the great difficulty of treatment when in disease there is a deficiency of lime in the body, especially in rickets, in which disease the want of lime in the bones gives rise to distortions. The sulphocarbolate of magnesium crystallises in large, clear, rhombic prisms, easily soluble in water.

Sulphocarbolate of Iron [$Fe(C_6H_5SO_4)_2$] is in colourless or pale green rhombic plates. It is readily administered, and seems in some instances to be preferred to other salts of iron. It seems to have been of especial use in the skin diseases of children, wherein there is much formation of matter.

Sulphocarbolate of Zinc [$Zn(C_6H_5SO_4)_2$] is chiefly employed in solution as a lotion. By high surgical authorities it is considered to answer all the purposes of the antiseptic dressing of carbolic acid. It is inodorous, and has very slight irritating action.

Sulphocarbolate of Copper [$Cu(C_6H_5SO_4)_2$] forms fine prismatic crystals of a blue colour. It is used as the zinc sulphocarbolate, chiefly as a lotion and dressing, in the proportion of 3 to 10 grains to the ounce of distilled water.

SULPHOCYAN'OGEN. A well-defined salt-radical, containing sulphur united to the elements of cyanogen. Its compounds are the sulphocyanides, most of which may be formed by directly saturating hydrosulphocyanic acid with the oxide or hydrate of the base; or, from the sulphocyanide of potassium and a soluble salt of the base, by double decomposition.

SULPHOPHE'NIC ACID. A synonym of sulphocarbolic acid. See SULPHOCARBOLATES.

SULPHOVIN'IC ACID. $C_2H_5HSO_4$. *Syn.* SULPHETHYLIC ACID; ACIDUM SULPHOVINICUM, L. This substance is formed by the action of heat on a mixture of alcohol and sulphuric acid; it is the intermediate product which is developed in the preparation of ether. The salts are called sulphovinates or sulphothylates.

SUL'PHUR. [Eng., L.] *Syn.* BRIMSTONE; SOUFRE, Fr. An elementary substance. That of commerce is chiefly imported from Sicily and Italy, and is a volcanic production.

Var. The principal of these are—

AMORPHOUS SULPHUR, BROWN S.; SULPHUR AMORPHUM, S. FUSCUM, S. INFORME, S. RUBRUM, L. Prepared from sublimed sulphur, by melting it, increasing the heat to from 320° to 350° Fahr., and continuing it at that temperature for about half an hour, or until it becomes brown and viscid, and then pouring it into water. In this state it is ductile, like wax, may be easily moulded in any form, is much heavier than usual, and when it has cooled does not again become fluid until heated to above 600° Fahr. The same effect is produced more rapidly by at once raising the temperature of the melted mass to from 430° to 480° Fahr.

PRECIPITATED SULPHUR, HYDRATE OF SULPHUR, MILK OF S.; SULPHURIS HYDRAS, LAC SULPHURIS, SULPHUR PRÆCIPITATUM (B. P., Ph.L.), L. *Prep.* From sublimed sulphur, 1 part; dry and recently slaked lime, 2 parts; water, 25 parts, or q. s.; boil for 2 or 3 hours, dilute with 25 parts more of water, filter, and precipitate with dilute hydrochloric acid; drain, and well wash the precipitate, and dry it by a gentle heat. Resembles sublimed sulphur in its general properties, but is much paler, and in a finer state of division. "A grayish-yellow powder, free from grittiness, and with no smell of sulphuretted hydrogen." (B. P.)

ROLL SULPHUR, CANE S., STICK S.; SULPHUR IN BACCULIS, S. IN ROTULIS, S. ROTUNDUM, L. This is crude sulphur, purified by melting and skimming it, and then pouring it into moulds. That obtained during the roasting of copper pyrites, and which forms the common roll sulphur of England, frequently contains from 3 to 7% of yellow arsenic.

SUBLIMED SULPHUR, FLOWERS OF SULPHUR; FLORES SULPHURIS, SULPHUR (Ph. L.), SULPHUR SUBLIMATUM (B. P., Ph. E. & D.), L. Prepared by subliming sulphur in iron vessels. For medical purposes, it is ordered to be well washed with water, and dried by a gentle heat. "A slightly gritty powder, of a fine greenish-yellow colour, without taste and without odour till heated." (B. P.)

SULPHUR VIVUM, BLACK SULPHUR, CRUDE S., HORSE BRIMSTONE; SULPHUR NIGRUM, S. CABALLINUM, S. GRISEUM, L. This is crude native sulphur. It is a gray or mouse-coloured powder. The residuum in the subliming pots from the preparation of flowers of sulphur is now commonly substituted for it. It generally contains much arsenic, and is consequently very poisonous.

Pur. The sublimed sulphur of the shops is now, in general, of respectable quality, but the precipitated sulphur frequently contains about ⅔ of its weight of sulphate of lime (plaster of Paris), owing to the substitution of sulphuric acid for hydrochloric acid in its manufacture. This sophistication is readily detected by strongly heating a little of the suspected sample in an iron spoon or shovel, when the sulphur is burnt or volatilised, and leaves behind the sulphate of lime as a white ash; this, when mixed with water, and gently dried, gives the amount of the adulteration. A still simpler plan is to dissolve out the sulphur in the sample with a little hot oil of turpentine or liquor of potassa; the undissolved portion is foreign matter.

Prop. Sulphur melts to a clear thin fluid, and volatilises at about 232° Fahr., and in open vessels rapidly takes fire, burning with a bluish flame. It is insoluble in both water and alcohol; it is soluble in oil of turpentine and the fatty oils, and freely so in bisulphide of carbon and hot liquor of potassa. With oxygen it unites to form sulphurous anhydride, and with the metals to form sulphides. Sp. gr. 1·982 to 2·015.

Estim. The determination of the quantity of sulphur, phosphorus, and chlorine, in a state of combination, especially in organic mixtures, is often rather troublesome. The proportion of sulphur is best determined by oxidising a known weight of the substances by strong nitric acid, or by fusing it in a silver vessel with 10 or 12 times its weight of pure hydrate of potassa and about half as much nitre. The sulphur is thus converted into sulphuric acid, the quantity of which can be determined by dissolving the fused mass in water, acidulating the solution with nitric acid, adding a salt of baryta, and weighing the resulting sulphate. Phosphorus is, in like manner, oxidised to phosphoric acid, the quantity of which is determined by precipitation in combination with sesquioxide of iron, or otherwise. The chlorine is correctly determined by placing a small weighed portion in a combustion-tube, which is afterwards filled with fragments of pure quicklime. The lime is then brought to a red heat, and the vapour of the liquid driven over it, when chloride of calcium is formed. The contents of the tube, when cold, are dissolved in dilute nitric acid, filtered, the chlorine precipitated by nitrate of silver, and the chlorine weighed under the form of chloride of silver. See ORGANIC SUBSTANCES.

Uses, &c. Sulphur is extensively used in the manufacture of gunpowder, in bleaching, &c. &c. When swallowed, it acts as a mild laxative and stimulating diaphoretic; and has hence been long taken in various chronic skin diseases, in pulmonary, rheumatic, and gouty affections, and as a mild purgative in piles, prolapsus ani, &c. Externally, it is extensively used in skin diseases, especially the itch, for which it appears to be a specific.—*Dose.* 20 to 63 grs., in sugar, honey, treacle, or milk.

Sulphur, Chlo''rides of. Several of these compounds exist, but the following are the most important. 1. (DICHLORIDE, S_2Cl_2.) Prepared by passing dry chlorine gas over the surface of sulphur melted in a bulbed-tube or small retort connected with a well-cooled receiver. The product is a deep orange-yellow and very mobile liquid, which possesses a disagreeable odour, and boils at 280° Fahr. It is soluble in bisulphide of carbon, and in benzol, without decomposing. It dissolves sulphur in large quantities, especially when heated. A solution of the dichloride with excess of sulphur in crude benzol is used for vulcanising caoutchouc.

2. (CHLORIDE, HYPOCHLORIDE, or HYPOCHLORITE of the shops; SULPHURIS CHLORIDUM, S. HYPOCHLORIDUM, S. HYPOCHLORITIS, L.) This is prepared by spreading washed sulphur thinly on the bottom of a wooden box, or other chamber, and passing chlorine gas slowly over until it ceases to be absorbed.

Obs. This last compound is of variable and undetermined constitution. It has been recommended for internal use, by Derksengi, in old gouty affections, combined with pains in the stomach, and in severe nervous fever.—*Dose.* ½ to 2 grs., dissolved in ether, and taken with old Hungary wine. It is also used externally in *psoriasis inveterata*, and other skin diseases.

I'odide of Sulphur. S_2I_2. *Syn.* BINIODIDE OF SULPHUR; SULPHURIS IODIDUM (Ph. L.), SULPHUR IODATUM (Ph. D.), L. *Prep.* Into a glass flask put 1 part of sublimed sulphur, and over it place 4 parts of iodine; insert the cork loosely, and place the flask in a water bath; as soon as its contents melt, stir them with a glass rod, replace the cork, remove the bath from the fire, and let the whole cool together. When cold, break the iodide into pieces, and place it in a wide-mouthed stoppered bottle. In this way a beautiful semi-crystalline, dark gray mass, resembling antimony, is obtained. The formulæ of the B. P., Ph. L. E. & D., Ph. U. S. & P. Cod., are essentially similar. The Ph. D. orders the two substances to be powdered and mixed before heating them.

Uses, &c. It is stimulant and alterative. An ointment made of it has been recommended by Biett and others in tuberculous affections of the skin, in lepra, psoriasis, lupus, porrigo, &c.

Iodide of sulphur stains the skin like iodine, and is readily decomposed by contact with organic substances.

SULPHURA'TION. The process by which silk, cotton, and woollen goods, straw plait, &c., are subjected to the fumes of burning sulphur, or sulphurous acid, for the purpose of bleaching or decolouring them. On the large scale, this is effected in closed apartments, called 'sulphuring rooms,' to which sufficient air only is admitted to keep up the slow combustion of the sulphur. On the small scale, as for straw hats, bonnets, &c., a large wooden chest is frequently employed in the same way.

SUL'PHURET. *Syn.* SULPHIDE; SULPHURETUM, SULPHIDUM, L. See SULPHIDE.

SULPHURET'TED HY'DROGEN. See HYDROGEN.

SULPHU'RIC ACID. H_2SO_4. *Syn.* OIL OF VITRIOL, BRITISH O. OF V., VITRIOLIC ACID†; ACIDUM SULPHURICUM (B. P., Ph. L. & E.), ACIDUM SULPHURICUM VENALE (Ph. D.), ACIDUM VITRIOLICUM†, L. This acid, in a concentrated form, was discovered by Basil Valentine towards the end of the 15th century. At first it was obtained by the distillation of green vitriol; but is now made by bringing sulphurous anhydride, arising from the combustion of sulphur, into contact with the vapour of nitric acid, evolved from a mixture of nitrate of soda and oil of vitriol, and of steam. The process is conducted in leaden chambers, into which steam is admitted continuously by several jets, and which have about three inches of water resting on the floor, to absorb the acid. As soon as the water, or rather liquid acid, has acquired the sp. gr. of 1·35 to 1·50, it is drawn off, and concentrated by boiling in shallow leaden pans to the density of about 1·72, after which it is further concentrated in green-glass or platinum retorts, until the sp. gr. reaches 1·842 to 1·846. When cold, the clear acid is put into large globular bottles of green glass (carboys), surrounded with straw and basket-work, and is sent into the market under the name of 'oil of vitriol."

Purif. Commercial sulphuric acid frequently contains nitrous acid, arsenic, lead, and saline matter. The nitrous acid may be removed by adding a little sulphate of ammonia, and heating the acid to ebullition for a few minutes. Both nitric and nitrous acid are thus entirely decomposed into water and nitrogen gas. The arsenic may be got rid of by adding a little sulphide of barium to the acid, agitating the mixture well, and, after repose, decanting and distilling it. Lead, which exists as sulphate, may be separated as a white precipitate by simply diluting the acid with water. Saline matter may be removed by simple rectification. A good way of purifying oil of vitriol is to heat it nearly to the boiling-point, and pass a current of hydrochloric acid through it; the arsenic is thus carried over as the volatile chloride of arsenic, while the nitrous and nitric acids are expelled almost completely. To obtain a perfectly pure acid, it should be distilled after the removal of the nitrous acid and arsenic by the methods indicated above. "The distillation is most conveniently conducted, on the small scale, in a glass retort, containing a few platinum chips, and heated by a sand bath or gas-flame, rejecting the first ½ fl. oz. that comes over." (Ph. E.) In the Ph. D. the first tenth of the distillate is ordered to be rejected, and the process to be stopped when no more than about 1 fl. oz. is left in the retort. According to Dr. Ure, the capacity of the retort should be from 4 to 8 times as great as the volume of the acid, and connected with a large tubular receiver by a loosely fitting glass tube, 4 feet long and 1 to 2 inches in diameter. "The receiver should not be surrounded with cold water." We find that fragments of glass, or of rock crystals, may be advantageously substituted for platinum foil, to lessen the explosive violence of the ebullition. Sulphuric acid which has become brown by exposure may be decolorised by heating it gently, the carbon of the organic substances being thus converted into carbonic acid.

Prop. Commercial sulphuric acid (oil of vitriol) is a colourless, odourless, and highly corrosive liquid, the general properties of which are well known. Its sp. gr. at 60° should never be greater than 1·848, or less than 1·840. (Miller and Odling give the sp. gr. of the pure and concentrated acid as 1·842; Abel and Bloxam, as 1·848; Apjohn gives it as 1·846, and Hardwich about 1·845.) It is immediately coloured by contact with organic matter. It attracts water so rapidly from the atmosphere, when freely exposed to it, as to absorb 1-3rd of its weight in 24 hours, and 6 times its weight in a few months. When 3 volumes are suddenly mixed with 2 of water, the temperature of the mixture rises more than 180° Fahr. Its freezing-point appears to be about 60° below that of water (Miller and Odling give that of the rectified acid as — 30° Fahr.; Apjohn and Abel and Bloxam, — 29°). It boils at about 620° Fahr. (620·6°, Odling; 620°, Hardwich and Fownes; 617°, Apjohn; 590·6°, Abel and Bloxam). It exhibits all the properties of the acids in an exalted degree. Its salts are called sulphates.

Pur. "Free from colour and odour. Sp. gr. 1·843. 100 grs. are saturated by 285 grs. of crystallised carbonate of soda." (Ph. L.) "What remains after the acid is distilled to dryness, does not exceed $\frac{1}{400}$th part of its weight. Diluted sulphuric acid is not discoloured by sulphuretted hydrogen." (Ph. L. 1836.) "Diluted with its own volume of water, only a scanty muddiness arises, and no orange fumes escape. Sp. gr. 1·840." (Ph. E.) The rectified acid (ACIDUM SULPHURICUM PURUM—Ph. E. & D.) is colourless; dilution causes no muddiness; solution of sulphate of iron shows no reddening at the line of contact when poured over it. Sp. gr. 1·845." (Ph. E.) Sp. gr. 1·846—Ph. D.; 1·843—B. P.; 1·842—Ure.

Tests.—See SULPHATE.

Uses, &c. Sulphuric acid is much employed in the arts, and, from its superior affinity, to disengage most of the other acids from their saline combinations in chemical processes. In the diluted state it is used in medicine. When swallowed, it acts as a violent corrosive poison. The antidotes are chalk, whiting, magnesia, carbonate of soda, or carbonate of potash, mixed with water, or any bland diluent, and taken freely, an emetic being also administered.

Estim. The strength of sulphuric acid is most correctly ascertained by its power of saturating bases. In commerce, it is usually determined from its sp. gr. The quantity of sulphuric acid present in a compound may be determined by weighing it under the form of sulphate, as explained in a former part of this volume. See ACIDIMETRY.

Concluding remarks. According to most of our standard works on chemistry, British oil of vitriol, when purified and brought to its maximum strength by distillation, is a definite chemical compound, having the formula H_2SO_4, and designated normal sulphuric acid by Odling. Marignac, however, asserts that the distilled acid always contains an excess of water, and that the true monohydrate can only be obtained by submitting fuming sulphuric acid (‘Nordhausen s. a.’) to congelation. According to this chemist, the true monohydrate readily freezes in cold weather, and remains solid up to 51° Fahr. Two other definite hydrates of sulphuric acid are generally recognised by chemists, viz.—Bihydrated sulphuric acid (‘glacial s. a.’), having a sp. gr. of 1·78; freezing at about 40° Fahr. (47°, Miller); and boiling at about 435° (Apjohn; 401° to 410°, Odling): Terhydrated sulphuric acid, having a sp. gr. of 1·632, and the boiling-point 348° Fahr. See also NORDHAUSEN SULPHURIC ACID (*below*).

Sulphuric Acid, Al′coholised. *Syn.* ACIDUM SULPHURICUM ALCOHOLISATUM, L.; EAU DE RABEL, Fr. *Prep.* (P. Cod.) To rectified spirit, 3 parts, add, very gradually, sulphuric acid, 1 part. It is generally coloured by letting it stand over a little cochineal. Refrigerant, and, externally, escharotic.—*Dose.* ½ fl. dr. to water, 1 pint; as a cooling drink in fevers, &c.

Sulphuric Acid, Anhy′drous. SO_3. *Syn.* SULPHURIC ANHYDRIDE, DRY SULPHURIC ACID; ACIDUM SULPHURICUM SINE AQUÂ, L. *Prep.* 1. By heating Nordhausen acid to about 100° Fahr. in a glass retort connected with a well-cooled receiver.

2. By distilling anhydrous bisulphate of soda, which has previously been raised to a low red heat in an earthen retort, to which a receiver is fitted without the aid of corks.

3. (Barreswill.) 2 parts of the strongest oil of vitriol are gradually added to 3 parts of anhydrous phosphoric acid, contained in a retort surrounded by a freezing mixture; when the compound has assumed a brown colour, the retort is removed from the bath, and connected with a receiver which is set there in its place; a gentle heat is now applied to it, when white vapours pass over into the receiver, and condense there under the form of beautiful silky crystals. The product equals in weight that of the phosphorus originally employed. “If a few drops of water be added, a dangerous explosion ensues.”

Prop. White, silky, asbestos-like crystals, deliquescing rapidly, and fuming in the air; put into water, it hisses like a red-hot iron; it melts at 77°, and rapidly volatilises at 86° Fahr.; it does not redden dry litmus paper; sp. gr. 1·97 at 78° Fahr.

Sulphuric Acid, Aromat′ic. *Syn.* ELIXIR OF VITRIOL, ACID E. OF V.; ACIDUM SULPHURICUM AROMATICUM (B. P., Ph. E. & D.), L. *Prep.* 1. (Ph. E. & D.) Oil of vitriol, 3½ fl. oz.; rectified spirit, 1½ pint; mix, add of powdered cinnamon, 1½ oz.; powdered ginger, 1 oz.; digest for 6 days (7 days—Ph. D.), and filter. Sp. gr. ·974—Ph. D.

2. (Wholesale.) From compound tincture of cinnamon, 1 gal.; oil of vitriol, 1 lb.; mix, and in a week filter—*Dose.* 10 to 30 drops, in the same cases as the dilute acid.

3. (B. P.) Sulphuric acid, 3; rectified spirit, 40; cinnamon, in powder, 2; ginger, in powder, 1¼; mix the acid gradually with the spirit, add the powders, macerate for 7 days, and filter. —*Dose.* 5 to 30 minims.

Sulphuric Acid, Dilute′. *Syn.* SPIRIT OF VITRIOL; ACIDUM SULPHURICUM DILUTUM (B. P., Ph. L. E. & D.), L. *Prep.* 1. (Ph. L.) Take of sulphuric acid, 15 fl. drs., and dilute it gradually with distilled water, q. s. to make the whole exactly measure a pint. Sp. gr. 1·103. “1 fl. oz. of this acid is exactly saturated by 216 grs. of crystallised carbonate of soda.”

2. (Ph. E.) Sulphuric acid, 1 fl. oz.; water, 13 fl. oz. Sp. gr. 1·090.

3. (Ph. D.) Pure sulphuric acid, 1 fl. oz.; distilled water, 13 oz. Sp. gr. 1·084.

4. (B. P.) Sulphuric acid, 3; distilled water, q. s. to measure 35¼; mix by adding the acid gradually to the water.—*Dose.* 4 to 20 minims.

Prop, &c. Antiseptic, tonic, and refrigerant. —*Dose.* 10 to 30 drops, largely diluted with water, several times daily; in low typhoid fevers, passive hæmorrhages, profuse perspiration, in various skin diseases to relieve the itching, in dyspepsia, &c. It is also used externally.

Sulphuric Acid, Nordhausen. *Syn.* FUMING SULPHURIC ACID; ACIDUM SULPHURICUM FUMANS, L. *Prep.* By distilling calcined ferrous sulphate (‘green vitriol’) in an earthen retort. The product is a brown oily liquid, which fumes in the air, is intensely corrosive, and has a sp. gr. about 1·900. When heated to about 100° Fahr., the anhydrous acid is given off, and ordinary oil of vitriol is left. According to Marignac, crystals of normal sulphuric acid (H_2SO_4) are formed in this acid when it is submitted to a low temperature. Nordhausen acid is so called from the place of its manufacture in Saxony. It may be regarded as a mixture or compound of H_2SO_4 and SO_3. It is chiefly used for dissolving indigo.

SULPHURIC ANHYDRIDE. See ANHYDROUS SULPHURIC ACID.

SULPHURIC E′THER. See ETHER.

SUL′PHUROUS ACID. SO_2. *Syn.* SULPHUROUS ANHYDRIDE; ACIDUM SULPHUROSUM, B. P. This compound is freely evolved in the gaseous form when sulphur is burnt in air or oxygen, and when the metals are digested in hot sulphuric acid; and, mixed with carbonic acid, when charcoal, chips of wood, cork, and sawdust, are treated in the same way.

Prep. 1. By the action of sulphuric acid on chippings of copper or mercury at a gentle heat. Pure.

2. (Berthier.) By heating, in a glass retort, a mixture of black oxide of manganese, 100 parts, and sulphur, 12 or 14 parts. Pure. The gas evolved should be collected over mercury, or received into water.

3. (Redwood.) Pounded charcoal, ½ oz.;

oil of vitriol, 4 fl. oz.; mix in a retort, apply the heat of a spirit lamp, and conduct the evolved gases by means of a bent tube into a bottle containing water. The sulphurous acid is absorbed, whilst the carbonic acid gas passes off.

4. (B. P.) Distilled water, saturated with sulphurous anhydride. It is colourless and emits a pungent odour. *Used* as a deoxidiser, disinfectant, and antiseptic. Diluted with from 1 to 2 parts of water it is employed as a lotion for wounds, cuts, ulcers, bed-sores, scalds, and burns; with from 1 to 5 of water it is used as a gargle, also as a lotion in parasitic skin diseases; from ½ to 1 dr., in a wine-glassful of water, 3 times a day, relieves constant sickness.

Prop., &c. Water absorbs 30 times its volume of this gas. Pure liquid sulphurous acid can only be obtained by passing the pure dry gas through a glass tube surrounded by a powerful freezing mixture. Its sp. gr. is 1·45; boiling-point, 14° Fahr.; it causes intense cold by its evaporation. Sulphurous acid forms salts called sulphites.

Uses. To bleach silks, woollens, straw, &c., and to remove vegetable stains and iron-moulds from linen. For these purposes it is prepared from sawdust or any other refuse carbonaceous matter.

Sulphurous Anhydride. See Sulphurous Acid.

SU'MACH. This dye stuff is chiefly used as a substitute for galls. With a mordant of acetate of iron, it gives gray or black; with tin or acetate of alumina, yellow; and with sulphate of zinc, a yellowish-brown; alone, it gives a greenish-fawn colour.

SUM'BUL. *Syn.* Musk root, Jatamansi, Sumbul root; Sumbul radix (B. P.). A substance introduced to British medicine by Dr. A. B. Granville, in 1850. It occurs in circular pieces, varying from 1 to 3 or 4 inches in diameter; has a musk-like odour, and a sweet balsamic taste. It acts as a powerful stimulant, especially of the nervous system. In India and Persia it has long been used as a medicine, a perfume, and as incense.—*Dose.* 15 grs. to 1 dr., either masticated, or made into an infusion, electuary, or tincture; in cholera, hysteria, neuralgia, epilepsy, low fevers, and various other spasmodic and nervous disorders.

SUMMER DRINKS. See Lemonade, Sherbet, &c.

SU'PER-. See Nomenclature.

SUP'PER. The evening meal; the last meal of the day. Supper is generally an unnecessary meal, and, when either heavy, or taken at a period not long before that of retiring to rest, proves nearly always injurious, preventing sound and refreshing sleep, and occasioning unpleasant dreams, nightmare, biliousness, and all the worst symptoms of imperfect digestion. The last meal of the day should be taken at least three hours before bedtime. Even when it consists of some 'trifle,' as a sandwich or biscuit, an interval of at least an hour should elapse before retiring to rest. In this way restlessness and unpleasant dreams will become rare.

SUPPOS'ITORY. *Syn.* Suppositorium, L. A medicine placed in the rectum for the purpose of affecting the lower intestine, or, by absorption, the system generally. Suppositories are rounded, usually, elongated masses, having the active medicine combined with some substance which will retain the proper shape, as soap, spermaceti cerate, or cacao-butter. The latter substance is, perhaps, the best vehicle for remedies prescribed in this form. It is, however, rather too soft to be used without admixture. According to Dorvault, the addition of one eighth part by weight of wax imparts the proper hardness. The mode of proportioning the doses of active ingredients has been noticed in the article Enema.

Suppository of Lead (Compound). *Syn.* Suppositorium plumbi compositum (B. P.). *Prep.* Acetate of lead, in powder, 36; opium, in powder, 12; benzoated lard, 42; white wax, 10; oil of theobroma, 80; melt the wax and oil of theobroma with a gentle heat, then add the other ingredients previously rubbed together in a mortar, and, having mixed them thoroughly, pour the mixture while it is fluid into suitable moulds of the capacity of 15 grs. The above makes 12 suppositories.

Suppository of Mercury. *Syn.* Suppositorium hydrargyri (B. P.). *Prep.* Ointment of mercury, 60 grs.; benzoated lard, 20 grs.; white wax, 20 grs.; oil of theobroma, 80 grs.; melt all but the mercurial ointment together, then add the ointment of mercury, stir till well mixed, and immediately pour into moulds of the capacity of 15 grs. The above makes 12 suppositories.

Suppository of Morphia. *Syn.* Suppositorium morphiæ (B. P.). *Prep.* Hydrochlorate of morphia, 6 grs.; oil of theobroma, 90 grs.; benzoated lard, 64 grs.; white wax, 20 grs.; melt the wax and oil of theobroma with a gentle heat, then add the hydrochlorate of morphia and benzoated lard, previously rubbed together in a mortar, and mix all the ingredients thoroughly; pour the mixture, while it is fluid, into suitable moulds of the capacity of 15 grs., or the fluid mixture may be allowed to cool, and then be divided into 12 equal parts, each of which should be made into a conical form.

Suppository for Piles. *Syn.* Suppositorium hæmorrhoidale, S. sedativum, L. *Prep.* 1. Powdered opium, 2 grs.; finely powdered galls, 10 grs.; spermaceti cerate, 1 dr.

2. (Ellis.) Powdered opium, 2 grs.; soap, 10 grs.; mix.

3. (Richard.) Extracts of opium and stramonium, of each, 1 gr.; cacao-butter, 2 drs. *Used* when the piles are very painful.

Suppository, Pur'gative. *Syn.* Suppositorium catharticum, L. *Prep.* 1. Soap, 1 dr.;

elaterium, 1 to 2 grs.; mix. As a strong purge.

2. (Niemann.) Soap, 2 drs.; common salt, 1 dr.; honey, q. s.; mix. As a mild cathartic.

Suppository, Resol'vent. *Syn.* Suppositorium resolvens, L. *Prep.* (Stafford.) Iodide of potassium, 3 to 4 grs.; extracts of henbane and hemlock, of each, 6 grs. In enlargement or induration of the prostate gland.

Suppository, Sed'ative. See *above*.

Suppository of Tannic Acid. *Syn.* Suppositorium acidi tannici (B. P.). *Prep.* Tannic acid, 36 grs.; benzoated lard, 44 grs.; white wax, 10 grs.; oil of theobroma, 90 grs.; melt the wax and oil with a gentle heat, then add the tannic acid and benzoated lard, previously rubbed together, and mix thoroughly. Pour the mixture, while it is fluid, into suitable moulds of the capacity of 15 grs. The above makes 12 suppositories.

Suppository, Ver'mifuge. *Syn.* Suppositorium anthelminticum, S. vermifugum, L. *Prep.* (Swediaur.) Aloes, 4 drs.; common salt, 3 drs.; flour, 2 drs.; honey, q. s. to make a stiff mass; divide into proper-shaped pieces, weighing about 15 grs. each. One to be used after each motion.

SWAL'LOW. Three or four species of *hirundo* (Linn.) pass under this name. It was once held in great repute in medicine. Even the excrement was included among the simples of the Ph. L. 1618. The swallow is an insectivorous bird, but, like the sparrow and rook, is much persecuted for its good services. It has been calculated that, directly and indirectly, a single swallow is the humble means of lessening the race of one kind of insect alone to the extent of 560,970,489,000,000,000 of its race in one year.

SWEET BALLS. *Prep.* Take of Florentine orris root, 3 oz.; cassia, 1 oz.; cloves, rhodium wood, and lavender flowers, of each, ½ oz.; ambergris and musk, of each, 6 grs.; oil of verbena, 10 or 12 drops; beat them to a paste, form this into balls with mucilage of gum tragacanth made with rose water, pierce them, whilst soft, with a needle, and, when they are quite dry and hard, polish them. Worn in the pocket as a perfume. Some persons varnish them, but that keeps in the smell.

SWEET BAY. *Syn.* Laurel; Laurus nobilis (Linn.), L. The fruit (lauri baccæ; laurus—Ph. L.), as well as the leaves (lauri folia), are reputed aromatic, stimulant, and narcotic. They were formerly very popular in coughs, colic, hysteria, suppressions, &c.; and, externally, in sprains, bruises, &c.

SWEET FLAG. *Syn.* Acorus calamus, L. A plant of the natural order *Orontiaceæ*. The rhizone ('root') is an aromatic stimulant, and is regarded by some as a valuable medicine in agues, and as a useful adjunct to other stimulants and bitter tonics. It is sometimes employed by the rectifiers of gin. The volatile oil obtained from it by distillation is employed for scenting snuff, and in the preparation of aromatic vinegar.

SWEETS. Home-made wines; British wines.

SWEET'BREAD. The thymus gland of the calf. When boiled, it is light and digestible; but when highly dressed and seasoned, it is improper both for dyspeptics and invalids. (Pereira.)

SWEET'MEATS. Under this head are properly included confections, candies, and preserves, in sugar; but, as generally employed, the word embraces all the sweet compounds of the confectioner.

Sweetmeats, as well as cakes, blancmange, and jellies, are not unfrequently coloured with deleterious substances, the consequences of which are always pernicious, and, in many instances, have proved fatal. Gamboge, a drastic cathartic; chrome yellow, red lead, orpiment, emerald green, and various other pigments containing lead, arsenic, copper, or other poisons, have been thus employed. The whole of these may be readily detected by the tests and characteristics appended to their respective names.

The colours and stains which may be safely employed to increase the beauty of these articles are noticed under Stains and Liqueur.

SWINE-POX. See Pox.

SYDENHAM'S LEN'ITIVE. *Prep.* Take of rhubarb (recently grated or powdered), 3 drs.; tamarinds, 2 oz.; senna, ½ oz.; coriander seeds (bruised), 2 drs.; boiling water, 1 pint; macerate for 3 hours in a covered vessel, and strain. An excellent stomachic and laxative.—*Dose.* ½ to 1 wine-glassful.

SYL'VIC ACID. *Syn.* Silvic acid. The portion of common resin or colophony which is the least soluble in cold and somewhate dilute alcohol.

SYM'BOLS. In chemistry, are representations of one atom of each of the elementary bodies, by the capital initial letter with or without the addition of a small letter of their Latin names. As C, for *carbon;* Fe (*ferrum*), iron; O, *oxygen*, &c.

SYMPATHET'IC INK. See *page* 643.

SYN'APTASE. *Syn.* Emulsin. The name given by Robiquet to the emulsin, a nitrogenised or albuminoid principle existing in both the bitter and sweet almond. It possesses the remarkable property of converting amygdalin, in the presence of water, into hydrocyanic acid and the essential oil of bitter almonds. 100 grs. of amygdalin yield, under the influence of synaptase and water, 47 grs. of raw oil, and 5·9 grs. of anhydrous hydrocyanic acid. (Liebig.)

SYN'COPE. See Fainting.

SYR'UP. *Syn.* Sirup, Sirop; Syrupus, L. A saturated, or nearly saturated, solution of sugar in water, either simple, flavoured, or medicated.

In the preparation of syrups care should be taken to employ the best refined sugar, and either distilled water or filtered rain water; by which they will be rendered much less liable to spontaneous decomposition, and will be perfectly transparent, without the trouble of clarification. When inferior sugar is employed, clarification is always necessary. This is best done by dissolving the sugar in the water, or other aqueous menstruum, in the cold, and then beating up a little of the cold syrup with some white of egg, and an ounce or two of cold water, until the mixture froths well; this must be added to the syrup in the boiler, and the whole 'whisked up' to a good froth; heat should now be applied, and the scum which forms removed from time to time with a clean 'skimmer.' As soon as the syrup begins to slightly simmer it must be removed from the fire, and allowed to stand until it has cooled a little, when it should be again skimmed, if necessary, and then passed through clean flannel. When vegetable infusions or solutions enter into the composition of syrups, they should be rendered perfectly transparent by filtration or clarification, before being added to the sugar.

The proper quantity of sugar for syrups will, in general, be found to be 2 lbs. (avoir.) to every imperial pint of water or thin aqueous fluid. These proportions, allowing for the water that is lost by evaporation during the process, are those best calculated to produce a syrup of the proper consistence, and possessing good 'keeping qualities.' They closely correspond to those recommended by Guibourt for the production of a perfect syrup, which, he says, consists of 30 parts of sugar to 16 parts of water.

In the preparation of syrups it is of great importance to employ as little heat as possible, as a solution of sugar, even when kept at the temperature of boiling water, undergoes slow decomposition. The plan which we adopt is to pour the water (cold) over the sugar, and to allow the two to lie together for a few hours, in a covered vessel, occasionally stirring, and then to apply a gentle heat (preferably that of steam or a water bath) to finish the solution. Some persons (falsely) deem a syrup ill prepared unless it has been allowed to boil well; but if this method be adopted, the ebullition should be only of the gentlest kind ('simmering'), and should be checked after the lapse of 1 or 2 minutes.

When it is necessary to thicken a syrup by boiling, a few fragments of glass should be introduced, in order to lower the boiling-point.

To make highly transparent syrups, the sugar should be in a single lump, and, by preference, taken from the bottom or broad end of the loaf, as, when taken from the smaller end, or if it be powdered or bruised, the syrup will be more or less cloudy.

Syrups are judged, by the laboratory man, to be sufficiently boiled when some taken up in a spoon pours out like oil, or, a drop cooled on the thumb-nail gives a proper 'thread' when touched. When a thin skin appears on blowing upon the syrup, it is judged, by the same party, to be completely saturated. These rude tests often lead to errors, which might be easily prevented by employing the proper proportions, or determining the sp. gr.

A fluid ounce of SATURATED SYRUP weighs 577½ grs.; a gallon weighs 13⅛ lbs. (avoir.); its sp. gr. is 1·319 to 1·321, or 35° of Baumé's aerometer; its boiling-point is 221° Fahr., and its density at the temperature of 212° is 1·260 to 1·261, or 30° Baumé. The syrups prepared with the juices of fruits, or which contain much extractive matter, as those of sarsaparilla, poppies, &c., mark about 2° or 3° more on Baumé's scale than the other syrups.

In most pharmaceutical works directions are given to completely saturate the water with sugar. Our own experience, which is extensive, leads us to disapprove of such a practice, since we find that, under all ordinary circumstances, a syrup with a very slight excess of water keeps better than one fully saturated. In the latter case a portion of sugar generally crystallises out on standing, and thus, by abstracting sugar from the remainder of the syrup, so weakens it, that it rapidly ferments and spoils. This change proceeds at a rapidity proportionate to the temperature. Saturated syrup kept in a vessel that is frequently uncorked or exposed to the air soon loses sufficient water, by evaporation from its surface, to cause the formation of minute crystals of sugar, which, falling to the bottom of the vessel, continue to increase in size at the expense of the sugar in the solution. We have seen a single 6-gallon stone bottle, in which syrup has been kept for some time, the inside of which, when broken, has been found to be entirely cased with sugar candy, amounting in weight to 16 or 18 lbs. On the other hand, syrups containing too much water also rapidly ferment, and become ascescent; but of the two, this is the less evil, and may be more easily prevented. The proportions of sugar and water given above will form an excellent syrup, provided care be taken that an undue quantity be not lost by evaporation.

The decimal part of the number denoting the sp. gr. of a syrup, multiplied by 26, gives the number of pounds of sugar it contains per gallon, very nearly. (Ure.)

In boiling syrups, if they appear likely to boil over, a little oil, or rubbing the edges of the pan with soap, will prevent it.

Syrups may be decoloured by agitation with, or filtration through, recently burnt animal charcoal. Medicated syrupsshould not, however, be treated in this way.

The preservation of syrups, as well as of all other saccharine solutions, is best promoted by keeping them in a moderately cool, but not a very cold, place. "Let syrups be kept in vessels well closed, and in a situation where the temperature never rises above 55° Fahr." (Ph. L.) They are better kept in smaller rather than in large bottles, as the longer a bottle lasts the more frequently it will be opened, and, consequently, the more it will be exposed to the air. By bottling syrups whilst boiling hot, and immediately corking down and tying the bottles over with bladder perfectly air-tight, they may be preserved, even at a summer heat, for years, without fermenting or losing their transparency.

The 'candying,' or crystallisation, of syrup, unless it be oversaturated with sugar, may be prevented by the addition of a little acetic or citric acid (2 or 3 drs. per gal.).

The fermentation of syrups may be effectually prevented by the addition of a little sulphite of potassa or of lime. Chlorate of potassa has been proposed for this purpose by Dr. Macculloch, on theoretical grounds. M. Chereau recommends the addition of some (about 3 to 4%) sugar of milk, with the same intention. Dr. Durand asserts that by adding about 1 fl. dr. of 'Hoffmann's anodyne' to each pint of syrup, the accession of fermentation may not only be prevented, but arrested when it occurs. Fermenting syrups may be immediately restored by exposing the vessel containing them to the temperature of boiling water. The addition of a little spirit is ordered in the new 'London Pharmacopœia.'

In making the above additions to syrup, care must be had not to mix incompatible substances. Thus, in general, the two methods referred to cannot be practised together.

Syrup is, perhaps, the worst possible form of medicine, owing to the difficulty of accurately saturating it with active medicinals, and its liability to change. Few persons think that "sweetness renders a nauseous drug more palatable." See also Squire's 'Companion to the British Pharmacopœia.'

The following formulæ embrace all the syrups (SYRUPI) which are officinal in these countries:—

Syrup of Ac'etate of Mor'phia. *Syn.* SYRUPUS MORPHIÆ ACETATIS, L. *Prep.* (Ph. D.) Solution of acetate of morphia, 1 fl. oz.; simple syrup, 15 fl. oz.; mix. Each fl. oz. contains ¼ gr. of acetate.—*Dose.* ½ to 2 teaspoonfuls.

Syrup of Al'mond. *Syn.* BARLEY SYRUP, ORGEAT; SYRUPUS AMYGDALÆ, L.; SIROP D'ORGEAT, Fr. *Prep.* 1. Sweet almonds, 1 lb.; bitter almonds, 1 oz.; blanch, beat them to a smooth paste, and make an emulsion with barley water, 1 quart; strain, to each pint add of sugar, 2 lbs., and a table-spoonful or two of orange-flower water; put the mixture into small bottles, and preserve it in a cool place. Some persons add a little brandy.

2. (Ph. Bor.) Sweet almonds, 8 oz.; bitter almonds, 2 oz.; blanch them, after cold maceration, then beat them in a marble mortar, with a wooden pestle, to a paste, adding, gradually, of water, 16 fl. oz.; orange-flower water, 3 fl. oz.; after straining through flannel, dissolve 3 lbs. of sugar in each pint of the emulsion. An agreeable pectoral and demulcent.

Syrup of Buck'thorn. *Syn.* SYRUPUS RHAMNI (B. P., Ph. L. & E.), S. RHAMNI CATHARTICI, L. *Prep.* 1. (Ph. L.) Juice of buckthorn, defecated by 3 days' repose, 2 quarts; ginger and allspice, of each (bruised), 6 drs.; macerate the spice in 1 pint of the juice, at a gentle heat, for 4 hours, and filter; boil the remainder of the juice to 1¼ pint, mix the liquors, dissolve therein of white sugar, 6 lbs., and add to (the nearly cold) syrup 6 fl. oz. of rectified spirit. In the Ph. E. the spirit is omitted.

2. (B. P.) Buckthorn juice, 97; ginger, sliced, 1; pimento, bruised, 1; refined sugar, 97; rectified spirit, 8 oz.; evaporate the juice to nearly half (⅝); add the ginger and pimento, digest at a gentle heat for four hours, and strain; when cold add the spirit, let the mixture stand for two days, then decant off the clear liquor, and in this dissolve the sugar at a gentle heat; sp. gr. 1·32.—*Dose.* 1 dr.

3. (Wholesale.)—*a.* Take of buckthorn juice, 3 galls.; bruised pimento and ginger (sifted from the dust), of each, ½ lb.; simmer for 15 minutes, strain, and add of sugar, 44 lbs.

b. Take of buckthorn juice, 3 galls.; boil to 2 galls., add of bruised pimento and ginger gruffs (free from dust), of each ¾ lb.; boil to 1 gal., strain, add molasses, 72 lbs., and finish the boiling.

Obs. Syrup of buckthorn is a brisk but unpleasant cathartic. It is now chiefly used in veterinary practice.—*Dose.* ¼ fl. oz. to 1 fl. oz. Should the colour be dull, the addition of a few grs. of citric or tartaric acid will brighten it.

Syrup of Cap'illaire *Syn.* SYRUP OF MAIDEN-HAIR; SYRUPUS ADIANTHI, SYRUPUS CAPILLORUM VENERIS, L.; CAPILLAIRE, SIROP DE CAPILLAIRE, Fr. *Prep.* (P. Cod.) Canadian maiden-hair (*Adiantum pedatum* — Linn.), 4 oz.; boiling water, 2½ pints; infuse, strain, add of white sugar, 5 lbs., and pour the boiling clarified syrup over 2 oz. more of maiden-hair; re-infuse for 2 hours, and again strain.

Obs Demulcent. Clarified syrup flavoured with orange-flower water or curaçoa is now commonly sold for CAPILLAIRE. It is usually 'put up' in small bottles of a peculiar shape, known in the trade as 'capillaires.' It is now chiefly used to sweeten and flavour grog. See CAPILLAIRE.

Syrup of Car'rageen. *Syn.* SYRUP OF ICELAND MOSS. *Prep.* Boil horehound, 1 oz., liverwort, 6 drs., in water, 4 pints, for 15 minutes; express and strain; then add carrageen (previously softened with cold water), 6 drs.; again boil for 15 minutes, strain through flannel, and add sugar, 1 lb., to each pint. An agreeable demulcent in coughs.

Syrup of Cit'ric Acid. *Syn.* SYRUPUS ACIDI

CITRICI (Ph. D.), L. *Prep.* (Ph. D.) Take of citric acid (in powder) and distilled water, of each, 2½ oz.; dissolve, add the solution, together with tincture of lemon peel, 5 fl. drs., to simple syrup, 3 pints, and mix with agitation. An agreeable refrigerant. Used for sweetening barley water, &c., and for flavouring water to be used as a beverage in fevers and other inflammatory diseases.

Syrup of Coch'ineal. *Syn.* SYRUPUS COCCINELLÆ, SYRUPUS COCCI (Ph. L.), L. *Prep.* (Ph. L.) Take of cochineal (bruised), 80 grs.; boiling distilled water, 1 pint; boil for 15 minutes in a closed vessel, strain, and add of sugar, 3 lbs., or twice that of the strained liquor; lastly, when the syrup has cooled, add of rectified spirit, 2½ fl. oz., or ½ fl. dr. to each fl. oz. of syrup. Used as a colouring syrup, and often sold for SYRUP OF CLOVE-PINKS.

Syrup of Colts'foot. *Syn.* SYRUPUS TUSSILAGINIS, L. *Prep.* (P. Cod.) Flowers of coltsfoot, 1 lb.; (or dried flowers, 2 oz.); boiling water, 2 lbs.; macerate for 12 hours; strain, press, filter, and add of white sugar, 4 lbs. A popular remedy in coughs, colds, &c.—*Dose.* 1 to 2 table-spoonfuls, *ad libitum.*

Syrup of Cream. Finely powdered lump sugar mixed with an equal weight of fresh cream. It will keep for a long time if put into bottles, and closely corked and sealed over. It is commonly placed in 2-oz. wide-mouthed phials, and taken on long voyages, a fresh phial being opened at every meal.

Syrup, Empyreumat'ic. Treacle.

Syrup of E'ther. *Syn.* SYRUPUS ÆTHERIS, S. Æ. SULPHURICI, L.; SIROP D'ÆTHER, Fr. *Prep.* (P. Cod.) Sulphuric ether, 1 part; white (simple) syrup, 16 parts; place them in a glass vessel having a tap at the bottom, shake them frequently for 5 or 6 days, and then draw off the clear syrup into small bottles.—*Dose.* ½ to 3 fl. drs.

Syrup of Gin'ger. *Syn.* SYRUPUS ZINGIBERIS (B. P., Ph. L. E. & D.), L. *Prep.* 1. (Ph. L.) Bruised ginger, 2¼ oz.; boiling water, 1 pint; macerate for 4 hours, strain, and add of white sugar, 2¼ lbs., or q. s.; and rectified spirit, as directed for syrup of cochineal. The Ph. E. omits the spirit.

2. (Ph. D.) Tincture of ginger, 1 fl. oz.; simple syrup, 7 fl. oz.; mix. Stimulant and carminative. Chiefly used as an adjuvant, in mixtures.

3. (B. P.) Strong tincture of ginger, 1; syrup, 25; mix.—*Dose.* 1 to 4 drms.

Syrup of Gum. *Syn.* SYRUPUS ACACIÆ, L.; SIROP DE GOMME, Fr. *Prep.* (P. Cod.) Dissolve pale and picked gum arabic in an equal weight of water, by a gentle heat, add the solution to four times its weight of simple syrup, simmer for 2 or 3 minutes, remove the scum, and cool. A pleasant demulcent. The addition of 1 or 2 fl. oz. of orange-flower water to each pint greatly improves it.

Syrup, Hive. Compound syrup of squills.

Syrup of Horehound. *Syn.* SYRUPUS MARUBII, L.; SIROP DE PRASSIO, Fr. *Prep.* 1. (P. Cod.) Dried horehound, 1 oz.; horehound water, 2 lbs.; digest in a water bath for 2 hours, strain, and add of white sugar, 4 lbs.

2. White horehound (fresh), 1 lb.; boiling water, 1 gal.; infuse for 2 hours, press out the liquor, filter, and add of sugar, q. s.

Obs. A popular remedy in coughs and diseases of the lungs.—*Dose.* A table-spoonful, *ad libitum.* "It is sold for any syrup of herbs that is demanded, and which is not in the shop." (Gray.)

Syrup of Hydrochlo''rate of Mor'phine. *Syn.* SYRUP OF MURIATE OF MORPHINE, SYRUPUS MORPHIÆ MURIATIS (Ph. D.), L. *Prep.* (Ph. D.) Solution of muriate of morphia, 1 fl. oz.; simple syrup, 17 fl. oz.; mix. Each fl. oz. contains ¼ gr. of the muriate.—*Dose.* ½ to 2 teaspoonfuls.

Syrup of Indian Sarsaparil'la. *Syn.* SYRUPUS HEMIDESMI (B. P., Ph. D.), L. *Prep.* 1. (Ph. D.) Indian sarsaparilla (*Hemidesmus Indicus*—Brown), bruised, 4 oz.; boiling water, 1 pint; infuse for 4 hours, and to the strained and defecated infusion add twice its weight of sugar. Tonic, diuretic, &c.—*Dose.* 2 to 4 fl. drs.; in nephritic complaints, and in some others, instead of sarsaparilla.

2. (B. P.) Hemidesmus, bruised, 1; refined sugar, 7; boiling distilled water, 5; infuse 4 hours, strain, add the sugar, and dissolve. The product should weigh 10½ and measure 8. Sp. gr. 1·335.—*Dose.* 1 to 4 drs.

Syrup of I'odide of Iron. *Syn.* SYRUPUS FERRI IODIDI (B. P., Ph. L. E. & D.), L. *Prep.* 1. (Ph. L.) Mix iodine, 1 oz., and iron wine, 3 drs., with distilled water, 8 fl. oz., and heat the solution until it assumes a greenish colour; then strain it, evaporate it to about 4 fl. oz., and add to it of white sugar, 10 oz.; lastly, when the syrup has cooled, add as much water as may be necessary, that it may measure exactly 15 fl. oz., and keep it in a well-stoppered black glass bottle. The formulæ of the Ph. E. & D. are nearly similar, a fl. dr. of each containing about 5 grs. of the pure dry iodide. This syrup is tonic and resolvent, and hæmatinic.—*Dose.* 15 or 20 drops to 1 fl. dr.; in anæmia, debility, scrofula, &c.

2. (B. P.) Iron wire, 1; iodine, 2; refined sugar, 28; distilled water, 13. Make a syrup with the sugar and 10 of the water, and keep it hot. Put into a strong soda-water bottle, covered with a cloth, the iron wire, the iodine, and 3 of the water, shake them together until the froth of the mixture becomes white, filter whilst still hot into the syrup. The product should be made up by water to weigh 43 or to measure 31½. Sp. gr. 1385.—*Dose.* 20 to 60 minims.

Syrup of Ipecacuan'ha. *Syn.* SYRUPUS IPECACUANHÆ, L. *Prep.* (Ph. E.) Ipecacuanha (in coarse powder), 4 oz.; rectified spirit, 15 fl. oz.; digest for 24 hours at a gentle heat, and strain; add of proof spirit, 14 fl. oz., and again digest and strain, and repeat the process with water, 14 fl. oz.; distil off the spirit from the mixed liquors, evaporate to 12 fl. oz., and filter; next add to the residuum rectified spirit, 5 fl. oz., and simple syrup, 7 pints, and mix well.—*Dose.* As an emetic for infants, ¼ teaspoonful; for adults, 1 to 1½ fl. oz.; as an expectorant, 1 to 3 teaspoonfuls.

Syrup of Lem′on. *Syn.* SYRUPUS LIMONIS (B. P.), SYRUPUS LIMONUM (Ph. L. & E.), SYRUPUS CITRI MEDICÆ. *Prep.* 1. (Ph. L.) Lemon juice (strained or defecated), 1 pint; white sugar, 2½ lbs.; dissolve by a gentle heat, and set it aside; in 24 hours remove the scum, decant the clear portion, and add of rectified spirit, 2½ fl. oz. The Edinburgh College omits the spirit. A pleasant refrigerant syrup in fevers, &c.—*Dose.* 1 to 4 fl. drs., in any diluent. With water it forms an excellent extemporaneous lemonade.

2. (B. P.) Fresh lemon peel, 2; lemon juice, strained, 20; refined sugar, 36. Heat the lemon juice to the boiling-point, and having put it into a covered vessel with the lemon peel, let them stand until they are cold, then filter and dissolve the sugar in the filtered liquid with a gentle heat. The product should weigh 56 and measure 41.—*Dose.* 1 to 2 drs.

Syrup of Marsh-mal′low. *Syn.* SYRUPUS ALTHÆÆ (Ph. L. & E.), L. *Prep.* 1. (Ph. L.) Marsh-mallow root, fresh and sliced, 1½ oz.; distilled water (cold), 1 pint; macerate for 12 hours, press out the liquor, strain it through linen, and add to the strained liquor twice its weight of white sugar (about 3 lbs.); dissolve by a gentle heat, and, when cold, add of rectified spirit, 2½ fl. oz., or q. s. See SYRUP OF COCHINEAL.

2. (Ph. L. 1836.) Take of fresh marsh-mallow root, bruised, 8 oz.; water, 4 pints; boil down to one half, and express the liquor when it is cold; set it aside for 24 hours, that the fæces may subside, then decant off the clear liquid, and, having added to it of sugar, 2½ lbs., boil the whole to a proper consistence. The formula of the Ph. E. is similar.

Obs. This is a popular demulcent and pectoral.—*Dose.* 1 to 4 fl. drs.; in coughs, &c., either alone or added to mixtures.

Syrup of Mul′berries. *Syn.* SYRUPUS MORI (B. P., Ph. L.), L. *Prep.* 1. (Ph. L.) Juice of mulberries, strained, 1 pint; sugar, 2¼ lbs.; dissolve by a gentle heat, and set the solution by for 24 hours; then remove the scum, decant the clear liquid, and add of rectified spirit, 2½ fl. oz. *Used* as a colouring and flavouring, when alkalies and earths are not present. Syrup of red poppies (*rhœados*), slightly acidulated with tartaric or dilute sulphuric acid, is very generally sold for it.

2. (B. P.) Mulberry juice, 20; refined sugar, 32; rectified spirit, 2½; heat the juice to the boiling-point, and, when it has cooled, filter it; dissolve the sugar in the filtered liquid by a gentle heat, and add the spirit. The product should weigh 54. Sp. gr. 1·33.—*Dose.* 1 to 2 drs.

Syrup of Mu″riate of Morphia. See SYRUP OF HYDROCHLORATE OF MORPHINE.

Syrup of Orange Flowers. *Syn.* SYRUPUS AURANTII FLORIS (B. P.). *Prep.* Orange-flower water, 8; refined sugar, 48; distilled water, 16, or a sufficiency; heat the sugar and water together, strain, and when nearly cold add the orange-flower water. When finished should weigh 72 and measure 54. Sp. gr. 1·33. —*Dose.* 1 to 2 drs.

Syrup of Or′ange Peel. *Syn.* SYRUPUS AURANTII (B. P., Ph. L. E. & D.), S. CITRI AURANTII, S. È CORTICIBUS AURANTIORUM, L. *Prep.* 1. (Ph. L.) Dried orange peel, 2½ oz.; boiling distilled water, 1 pint; macerate for 12 hours in a covered vessel, press out the liquor, simmer it for 10 minutes, and then complete the process as directed for SYRUP OF COCHINEAL. In the Ph. E. & D., & Ph. L. 1836, no spirit is ordered.

2. (B. P.) Tincture of orange peel, 1; syrup, 7; mix.—*Dose.* 1 to 2 drs.

3. (Wholesale.)—*a.* From fresh orange peel, 18 oz. (or dried), ¾ lb.; sugar, 18 lbs.; water, q. s.

b. From tincture of orange peel, 1 fl. oz.; simple syrup, 19 fl. oz.; mix. An agreeable flavouring and stomachic.—*Dose.* 1 to 4 fl. drs.

Syrup of Pop′pies. *Syn.* SYRUP OF WHITE POPPIES; SYRUPUS PAPAVERIS (B. P., Ph. L. & E.), S. P. SOMNIFERI, L. *Prep.* 1. (B. P.) Poppy capsules, coarsely powdered, free from seeds, 36; rectified spirit, 16; refined sugar, 64; boiling distilled water, a sufficiency; macerate the poppy capsules in 80 of the water. Infuse for 24 hours, then pack in a percolator, and, adding more of the water, allow the liquor slowly to pass until 320 have been collected or the poppies are exhausted; evaporate the liquor by a water bath until it is reduced to 60; when quite cold add the spirit; let the mixture stand for 12 hours and filter. Distil off the spirit, evaporate the remaining liquor to 40, and then add the sugar. The product should weigh 104 and measure 78¾. Sp. gr. 1·32.—*Dose.* 1 dr.; 10 to 20 minims for children, increasing cautiously.

2. (Ph. L.) Poppy-heads, dried, bruised, and without the seed, 3 lbs.; boiling water, 5 galls.; boil down to 2 galls., press out the liquor, evaporate the expressed liquid to 2 quarts, strain it whilst hot, and set it aside for 12 hours; next decant the clear portion from the fæces, boil this down to 1 quart, and dissolve in it sugar, 5 lbs.; lastly, when cold, add of rectified spirit; 5 fl. oz. "Each fl. oz. is equivalent to 1 gr. of dry extract." In the Ph. E. & Ph. D. 1826 no spirit is ordered.

3. (Wholesale.) Extract of poppies, 1½ lb.; boiling water, 2½ galls.; dissolve, clarify, or filter, so that it may be perfectly transparent

when cold, then add of white sugar, 44 lbs., and dissolve.

Obs. Syrup of poppies is anodyne and soporific.—*Dose.* For an infant, ¼ to ½ teaspoonful; for an adult, 2 to 4 fl. drs. According to M. Chereau, its tendency to fermentation is prevented by the addition of 32 parts of sugar of milk to every 1000 parts of the syrup.

Syrup of Red Pop'pies. *Syn.* SYRUPUS RHŒADOS, (Ph. L. & E.)., S. PAPAVERIS RHŒADOS, L. *Prep.* 1. (Ph. L.) Petals of the red poppy, 1 lb.; boiling water, 1 pint; mix in a water bath, remove the vessel, macerate for 12 hours, press out the liquor, and, after defecation or filtering, complete the process as directed for SYRUP OF COCHINEAL.

2. (Wholesale.) From dried red-poppy petals, 3 lbs,; boiling water, q. s.; white sugar, 44 lbs.; as the last.

Obs. Syrup of red poppies is chiefly employed for its fine red colour. A little acid brightens it. The colour is injured by contact with iron, copper, and all the common metals.

Syrup of Rhu'barb. *Syn.* SYRUPUS RHEI (B. P.). *Prep.* 1. (B. P.). Rhubarb, in coarse powder, 2; coriander fruit, in powder, 2; refined sugar, 24; rectified spirit, 8; distilled water, 24; mix the rhubarb and coriander, pack them in a percolator, pass the spirit and water, previously mixed, slowly through them, evaporate the liquid that has passed until it is reduced to 13, and in this, after it has been filtered, dissolve the sugar with a gentle heat. —*Dose.* 1 to 4 drs.

2. (P. Cod.) Bruised rhubarb, 3 oz.; cold water, 16 fl. oz.; macerate for 12 hours, filter, and add of white sugar, 32 oz.

3. (Ph. U. S.) Take of rectified spirit, 8 fl. oz.; water, 24 fl. oz.; rhubarb (coarsely powdered), 2 oz.; (mixed with) sand, an equal bulk, or q. s.; make a tincture by percolation, evaporate this, over a water bath, to 13 fl. oz., and dissolve it in 2 lbs. of white sugar. An excellent formula.

4. (Wholesale.) Rhubarb (bruised), 1¾ lb.; cold water, q. s.; sugar, 20 lbs.; as No. 1. Stomachic and purgative.—*Dose.* For an infant, ½ to 1 teaspoonful; for an adult, ½ to ¾ fl. oz., or more.

Syrup of Rhubarb (Spiced). *Syn.* SYRUPUS RHEI AROMATICUS, L. *Prep.* (Ph. U. S.) Rhubarb, 2½ oz.; cloves and cinnamon, of each, ½ oz.; nutmeg, ¼ oz.; (all bruised;) proof spirit, 32 fl. oz.; macerate for 14 days (or percolate), strain, gently evaporate to 16 fl. oz., filter whilst hot, and mix the liquid with simple syrup (gently warmed), 4¾ pints. A cordial laxative.—*Dose.* ½ to 1 teaspoonful; in infantile constipation, diarrhœa, &c.

Syrup of Ros''es. *Syn.* SYRUPUS ROSÆ (Ph. L.), SYRUPUS ROSÆ CENTIFOLIÆ (Ph. E.), L. *Prep.* 1. (Ph. L.) Dried petals of damask roses (*Rosa centifolia*), 7 oz.; boiling water, 3 pints; macerate for 12 hours, filter, evaporate in a water bath to 1 quart, and add of white sugar, 6 lbs.; and, when cold, rectified spirit, 5½ fl. oz.

2. (Wholesale.) From rose leaves, 1 lb.; sugar, 19 lbs.; water, q. s.; as the last. Gently laxative.—*Dose.* ¼ to 1 fl. oz. It is usual to add a few drops of dilute sulphuric acid, to brighten the colour. Alkalies turn it green.

Syrup of Red Roses. *Syn.* SYRUPUS ROSÆ (B. P.), SYRUPUS ROSÆ GALLICÆ (Ph. E. & D.), L. *Prep.* 1. (Ph. E.) Dried petals of the red rose, 2 oz.; boiling water, 1 pint; pure sugar, 20 oz.; as the last.

2. (Ph. D.) Dried petals of the gallic rose, 2 oz.; boiling water, 1 pint; boil in a glass or porcelain vessel until the colour is extracted, strain with expression, and, after defecation, add to the clear decanted liquor twice its weight of white sugar. Astringent and stomachic; chiefly used as an adjunct in mixtures, &c.

3. (B. P.) Dried rose petals, 1; refined sugar, 15; boiling distilled water, 10; infuse the petals in the water 2 hours, squeeze through calico, heat the liquor to the boiling-point, and filter; add the sugar and dissolve with heat. The product should weigh 23 and measure 17¼. Sp. gr. 1·335.—*Dose.* 1 to 2 drs.

Syrup of Rue. *Syn.* SYRUPUS RUTÆ, L. *Prep.* Take of oil of rue, 12 to 15 drops; rectified spirit, ½ fl. oz.; dissolve, and add it to simple syrup, 1 pint.—*Dose.* ½ to 1 teaspoonful; in the flatulent colic of children. An infusion of ½ oz. of the herb is sometimes substituted for the solution of the essential oil.

Syrup of Saf'fron. *Syn.* SYRUPUS CROCI (Ph. L. E. & D.), L. *Prep.* 1. (Ph. L.) Hay saffron, 5 drs. (10 drs.—Ph. E.; ½ oz.—Ph. D.); boiling water, 1 pint; macerate in a covered vessel for 12 hours, then strain the liquor, and add of white sugar, 3 lbs., or q. s., and rectified spirit, 2½ fl. oz., or q. s., in the manner directed under SYRUP OF COCHINEAL. The Ph. E. and D. omit the spirit.

2. (Wholesale.) Hay saffron, 6 oz.; boiling water, 6 quarts; white sugar, 24 lbs.; as the last. *Used* for its colour and flavour; the first is very beautiful.

Syrup of Sarsaparil'la. *Syn.* SYRUPUS SARZÆ (Ph. L. & E.), SYRUPUS SARSAPARILLÆ, L. *Prep.* 1. (Ph. L.) Take of sarsaparilla (sliced), 3½ lbs.; boil it in water, 2 galls., down to one half; pour off the liquor, and strain it whilst hot; again boil the sarsaparilla in another gal. of water down to one half, and strain; evaporate the mixed liquors to 1 quart, and in these dissolve of white sugar, 8 oz.; lastly, when the syrup has cooled, add to it of rectified spirit, 2 fl. oz.

2. (Ph. E., & Ph. L. 1836.) Sarsaparilla, sliced, 15 oz.; boiling water, 1 gal.; macerate for 24 hours, boil to 2 quarts, strain, add of sugar, 15 oz., and boil to a syrup.

3. (Wholesale.) Take of extract of sarsa-

parilla, 3 lbs.; boiling water, 3 quarts; dissolve, strain, and add of white sugar, 12 lbs. Alterative and tonic.—*Dose.* 2 to 4 drs. See SARSAPARILLA.

Syrup of Sarsaparil'la (Compound). *Syn.* SYRUPUS SARZÆ COMPOSITUS, L.; SYROP DE CUISINIER, Fr. *Prep.* (Ph. U. S.) Sarsaparilla, bruised, 2 lbs.; guaiacum wood, rasped, 3 oz.; damask roses, senna, and liquorice root, bruised, of each, 2 oz.; diluted alcohol (proof spirit), 10 wine pints (1 gal. imperial); macerate for 14 days, express, filter through paper, and evaporate in a water bath to 4 wine pints (3⅓ pints, imperial); then add of white sugar, 8 lbs., and, when cold, further add of oils of sassafras and aniseed, of each, 5 drops, and oil of partridge berry (*Gaultheria procumbens*), 3 drops, previously triturated with a little of the syrup.

Obs. This is an excellent preparation; but the rose leaves might be well omitted.—*Dose.* ½ fl. oz., 3 or 4 times a day, as an alterative, tonic, and restorative. The syrup of the P. Cod. is made with water instead of spirit, and is inferior as a remedy to the preceding.

Syrup of Sen'na. *Syn.* SYRUPUS SENNÆ (B. P., Ph. L. & E.), L. *Prep.* 1. (Ph. L.) Take of senna, 3½ oz.; fennel seed (bruised), 10 drs.; boiling water, 1 pint; macerate for 6 hours, with a gentle heat; then strongly press out the liquid through linen, and dissolve in it of manna, 3 oz.; next add this solution to treacle, 3 lbs., previously evaporated over a water bath until a little of it, on being cooled, almost concretes, and stir them well together.

2. (Ph. E.) Senna, 4 oz.; boiling water, 24 fl. oz.; infuse, strain, add of treacle, 48 oz., and evaporate to a proper consistence. Aperient.—*Dose.* 1 to 4 drs.

3. (B. P.) Senna, broken small, 8 oz.; oil of coriander, 4½ minims; refined sugar, 12 oz.; distilled water, 50 oz., or a sufficiency; rectified spirit, 1 oz.; digest the senna in ¾ of the water twenty-four hours at a temperature of 120°, press, and strain; digest the marc in the remainder of the water six hours, press, and strain; evaporate the mixed liquors to 5 oz.; when cold add the rectified spirit containing the oil of coriander; filter, and wash the filter with water to make up 8 oz.; add the sugar, and dissolve with gentle heat. The product should weigh 21 oz. and measure 16 oz. Sp. gr. 1·310.—*Dose.* 1 to 2 drms.

Syrup, Simple. *Syn.* SYRUPUS (B. P. Ph., L.), SYRUPUS SIMPLEX (Ph. E. &. D.), L. 1. (Ph. L.) White sugar, 3 lbs.; distilled water, 1 pint; dissolve by a gentle heat.

2. (Ph. E., & Ph. L. 1836.) Pure sugar, 10 lbs.; boiling water, 3 pints.

3. (Ph. D.) Refined sugar (in powder—crushed), 5 lbs.; distilled water, 1 quart.

4. (B. P.) Refined sugar, 6; distilled water, 3; dissolve the sugar in the water with the aid of heat, and when cool add water to make the product weigh 9 and measure very nearly 7. Sp. gr., 1·33.

5. (Wholesale.) Finest double refined sugar, 44 lbs.; distilled water, 2¾ galls.; make a syrup.

Obs. This preparation should be as white and transparent as water. *Used* as capillaire, &c., and to give cohesiveness and consistence to pulverulent substances in the preparation of electuaries, pills, &c.

Syrup of Squills. *Syn.* SYRUPUS SCILLÆ (B. P., Ph. E. & D.), L. *Prep.* 1. (Ph. E.) Vinegar of squills, 3 pints; white sugar (in powder), 7 lbs.; dissolve by a gentle heat.

2. (Ph. D.) Vinegar of squills, 8 fl. oz.; refined sugar (in powder), 1 lb.; dissolve.

3. (B. P.) Vinegar of squills, 20; refined sugar, 40; dissolve with the aid of heat.—*Dose.* ½ to 1 dr.

4. (Wholesale.) Take of vinegar of squills (perfectly transparent), 14 lbs.; double refined sugar, 28 lbs.; dissolve in a stoneware vessel, in the cold, or at most by a very gentle heat.

Obs. This syrup, like the last, should be as clear as water, and nearly colourless.—*Dose.* 1 to 2 fl. drs., as an expectorant; in chronic coughs and asthma. In large doses it proves emetic.

Syrup of Squills (Compound). *Syn.* HIVE SYRUP; SYRUPUS SCILLÆ COMPOSITUS, L. *Prep.* (Ph. U. S.) Squills and senega, of each, bruised, 5 oz.; water, ½ gal.; boil to a quart; add of sugar, 4½ lbs.; evaporate to 3 pints, or a proper consistence, and dissolve in it, whilst hot, of potassio-tartrate of antimony (in powder), 1 dr.

Obs. This syrup is a popular expectorant in the U. S., where it is known as hive syrup.—*Dose.* As an expectorant, 20 to 30 drops, for adults; for children, 5 to 10 drops; in croup, 10 drops to ½ fl. dr., repeated until it vomits.

Syrup of Tolu'. *Syn.* BALSAMIC SYRUP; SYRUPUS TOLUTANUS (B. P., Ph. L. E. & D.), L. *Prep.* 1. (Ph. L.) Balsam of Tolu, 10 drs. (1 oz.—Ph. D.); boiling distilled water, 1 pint; boil in a covered vessel for ½ an hour, frequently stirring, then cool, strain, and dissolve in the liquor sugar, 2½ lbs.

2. (Ph. E.) Simple syrup (warm), 2 lbs.; tincture of Tolu, 1 oz.; mix by degrees, and agitate them briskly together in a closed vessel.

3. (B. P.) Balsam of Tolu, 1½; sugar, 32; water, 20; boil the balsam half an hour, adding water when required; when cold make up to 16, filter, add the sugar, and dissolve. The product weighs 48 and measures 36. Sp. gr., 1·33.—*Dose.* 1 to 2 drs.

4. (Wholesale.) To warm water, 23 lbs., add tincture of Tolu, gradually, until it will bear no more without becoming opaque; then cork down the bottle, and occasionally agitate until cold; when quite cold, filter it through paper, and add of the finest double-refined sugar, 44 lbs.; lastly, promote the solution, in a closed vessel, by a gentle heat, in a water bath.

Obs. This syrup should be clear and colourless as water; but, as met with in the shops, it is usually milky. It is strange that the London College should have omitted from their formula the usual addition of rectified spirit, although this syrup, perhaps more than any other, would be benefited by it.

Syrup of Tolu is pectoral and balsamic.

Syrup, Velno's Vegetable. According to Dr. Paris and Sir B. Brodie, this celebrated nostrum is prepared as follows:—Young and fresh burdock root, sliced, 2 oz.; dandelion root, 1 oz.; fresh spearmint, senna, coriander seed, and bruised liquorice root, of each, 1½ dr.; water, 1½ pint; boil down gently to a pint, strain, add of lump sugar, 1 lb., boil to a syrup, and, lastly, add a small quantity of corrosive sublimate, previously dissolved in a little spirit. *Used* as an alterative and purifier of the blood.

Syrup of Vin'egar. *Syn.* SYRUPUS ACETI, L. *Prep.* (Ph. E.) Take of vinegar (French, in preference), 11 fl. oz.; white sugar, 14 oz.; and make a syrup.—*Dose.* 1 dr. to 1 fl. oz.; as an expectorant, in coughs and colds, or diffused through any mild diluent, as a drink in fevers. A more agreeable preparation is that of the P. Cod., made by dissolving 30 parts of sugar in 16 parts of raspberry vinegar.

Syrup of Vi'olets. *Syn.* SYRUPUS VIOLARUM, SYRUPUS VIOLÆ (Ph. L. & E.), L. *Prep.* 1. (Ph. L.) Macerate violet flowers, 9 oz., in boiling water, 1 pint, for twelve hours, then press, strain, and set aside the liquid, that the fæces may subside; afterwards complete the process with sugar, 3 lbs., and rectified spirit, 2½ fl. oz., (or as much of each as may be necessary,) in the way which has been ordered concerning syrup of cochineal.

2. (Ph. E.) Fresh violets, 1 lb.; boiling water, 2½ pints; infuse for 24 hours in a covered vessel of glass or earthenware, strain off the liquor (with gentle pressure), filter, and dissolve in the liquid white sugar, 7½ lbs.

3. (Wholesale.) From double-refined white sugar, 66 lbs.; 'anthokyan,'[1] 11 lbs.; water, 22 lbs., or q. s.; dissolve in earthenware.

Uses. Syrup of violets is gently laxative.—*Dose.* For an infant, a teaspoonful.

Obs. Genuine syrup of violet has a lively violet-blue colour, is reddened by acids, turned green by alkalies, and both smells and tastes of the flowers. It is frequently *used* as a test. A spurious sort is met with in the shops, which is coloured with litmus, and slightly scented with orris root. The purest sugar, perfectly free from either acid or alkaline contamination, should alone be used in the manufacture of this syrup. The Ph. E. orders the infusion to be strained without pressure; and the P. Cod., and some other Ph., direct the flowers to be first washed in cold water.

Syrup of Worm'wood. *Syn.* SYRUPUS ABSINTHII, L.; SIROP D'ABSINTHE, Fr. *Prep.* (P. Cod.) Tops of wormwood (dried), 1 part; boiling water, 8 parts; infuse for 12 hours, strain, with expression, and dissolve in the liquor twice its weight of sugar. Bitter, tonic, and stomachic.—*Dose.* 1 to 3 fl. drs.

TABLETTES. [Fr.] See LOZENGES and SAVONETTES.

TAF'FETAS. Plasters on silk are occasionally so called. For TAFFETAS ANGLICUM, see COURT PLASTER; for TAFFETAS VESICANS, see VESICANTS.

TALC. *Syn.* FOLIATED TALC; UBRUC. A transparent, foliated, siliceous magnesian mineral, flexible, but not elastic, found in Scotland, the Tyrol, and elsewhere. It is used as a cosmetic, to impart a silky whiteness to the skin; also in the composition of *rouge végétal*, and to give a flesh-like polish to alabaster figures. A second and harder species of this mineral (FRENCH CHALK, SOAPSTONE, STEATITE; CRETA GALLICA) is employed as a crayon by carpenters, glaziers, and tailors, and forms the boot-powder of the boot-makers. Writing executed with it on glass, even after being apparently removed by friction, becomes again visible when breathed upon.

TAL'LOW and other fats are commonly purified by melting them along with water, passing the mixed fluids through a sieve, and letting the whole cool slowly, when a cake of cleansed fat is obtained.—Another plan is to keep the tallow melted for some time, along with about 2% of oil of vitriol, largely diluted with water, employing constant agitation, and allowing the whole to cool slowly; then to remelt the cake with a large quantity of hot water, and to wash it well.—Another method is to blow steam for some time through the melted fat. By either this or the preceding process a white hard tallow may be obtained.—Some persons add a little nitre to the melted fat, and, afterwards, a little dilute nitric or sulphuric acid, or a solution of bisulphate of potash. Others boil the fat along with water and a little dilute nitric or chromic acid, or a mixture of bichromate of potash and sulphuric acid; and afterwards wash it thoroughly with water. These methods answer well for the tallow or mixed fats of which ordinary candles are made.

Tallow converted into stearic acid by saponification is readily hardened and bleached, if moderately pure. A mixture composed of 1 part of oxalic acid and 2000 parts of water is sufficient to bleach 1000 parts of stearic acid. The mode of operating is as follows:—Throw the stearic acid, cut into small pieces, into a vessel of cold water, and turn on steam; as soon as it has melted and assumed a turbid appearance, add the solution of oxalic acid, and boil the mixture. After boiling for ½ hour, long threads appear in the liquid; the liquid itself, which previously was of a grayish colour, becomes black, and the threads unite together. The boiling must now be discontinued, and the contents of the vessel, having been allowed to settle for three or four hours, must be drawn off into the coolers.

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[1] The expressed juice of violets, defecated, gently heated in earthenware to 192° Fahr., then skimmed, cooled, and filtered; a little spirit is next added, and the next day the compound is again filtered.

As commercial stearic acid frequently contains undecomposed tallow, as well as various foreign matters, this process is occasionally unsuccessful. To obviate the inconveniences connected with the use of this impure material, the candle may be run at two operations, as follows :—"The stearic acid, treated as above, is exposed for a month to the sun, by which means the foreign matters are oxidised, and the bleached stearic acid acquires a dirty yellow colour; the oxidised blocks are then melted in water containing a little sulphuric acid, at about 150° Fahr.; an addition of about 10 per cent. of good white wax (or spermaceti) is next made, and the whole boiled for half an hour; the white of an egg, previously beaten up in a quart of water, is then added to each 1 cwt. of stearic acid, the temperature of the mass having been reduced to 100°, or at most 120° Fahr., after which the mixture is again well stirred and boiled, when the liquid soon becomes clear, which is seen by the dark colour it assumes.

"This mixture of stearic acid and wax or spermaceti is very suitable for forming the exterior coating of the candle; it is transparent, and of perfect whiteness, and, as it is devoid of oxalic acid, it does not injure the moulds; whilst at the same time, as it is less fusible than pure stearic acid, candles made with it do not run. This first coating may be run hot without crystallising; the interior of the candle, being protected from without against too sudden a cooling, may also be run somewhat hot; by this means the candle acquires a whiteness and a transparency which cannot be realised by other processes." ('Le Moniteur Industriel.')

The sulphuric acid saponification of inferior tallow and other solid or semi-solid fatty bodies is now carried out on a very large scale for producing the cheaper varieties of 'stearine candles.' For this purpose, the tallow or fat is mixed with 5 or 6% of concentrated sulphuric acid, and exposed to a steam heat of 350° to 360° Fahr. After cooling, the black mass thus obtained crystallises to a tolerably solid fat, which is well washed once or twice with water, or high-pressure steam, and is then submitted to distillation by the aid of steam heated to about 560° Fahr. The product of the distillation is beautifully white, and may be at once used for making candles. It is better, however, to first submit it to the processes of cold and hot pressing, whereby a much more solid fat is obtained.

According to M. Pohl, palm oil or palm tallow is most easily purified by simple exposure to a high temperature, provided it has been first well defecated. When quickly heated to about 465° Fahr., and kept at that temperature for from 5 to 15 minutes, it is completely decoloured. The product has a slight empyreumatic odour, but this disappears by age, exposure, or saponification, and the natural violet odour of the oil returns. Cast-iron pans should be employed in the process, and should be only 2-3rds filled, and well covered during the operation.

By the distillation of sulphurated palm oil in closed vessels, at a heat ranging from 570° to 600° Fahr., from 68% to 75% of a mixture of palmitic and palm-oleic acid passes over, of which 25% to 30% is colourless, hard, and crystalline, and the rest darker and softer. (Pohl.) The residuum in the still is a fine hard pitch. See **CANDLES**, **FAT**, **GLYCERIN**, **OILS** (Fixed), **STEARIC ACID**, &c.

TAMAR'A. A mixed spice used in Italian cookery, consisting of cinnamon, cloves, and corianders, of each, 2 parts; aniseed and fennel seed, of each 1 part.

TAM'ARIND. *Syn.* TAMARINDUS (B. P., Ph. L. E. & D.), L. The pulp or preserved fruit or pod of the *Tamarindus Indica*, or tamarind tree.

Tamarind pulp is refrigerant and gently laxative. Mixed with water, it forms a grateful acidulous drink in fevers.—*Dose.* ½ oz. and upwards.

TAN'NATE. A salt of tannic acid.

TAN'NER'S BARK. The best of this is oak bark; but the bark of the chestnut, willow, and larch, and other trees which abound in tannin, are also used for preparing leather.

TAN'NIC ACID. $C_{27}H_{22}O_{17}$. *Syn.* TAN, TANNIN, GALLO-TANNIC ACID†; TANNINUM, ACIDUM TANNICUM (B. P., Ph. L. D. & U. S.), L. A peculiar vegetable principle, remarkable for its astringency and its power of converting the skins of animals into leather.

Prep. 1. (Pelouze.) From galls, in moderately fine powder, by percolation, in a closed vessel, with sulphuric ether that has been previously agitated with water. After some time the percolated liquid will be found divided into two distinct portions, the lower and heavier one being a watery solution of tannic acid, and the upper one an ethereal solution of gallic acid and colouring matter. Fresh ether must be passed through the powder as long as the lower stratum of liquid continues to augment. The two fluids are now carefully separated, and after the heavier one has been well washed with ether, it is gently evaporated to dryness, preferably under the receiver of an air-pump, or over sulphuric acid. The ether may be recovered unaltered from the ethereal solution, by cautious distillation in a retort connected with a Liebig's condenser supplied with ice-cold water. *Prod.* About 40%.

2. (Ph. D.) From galls, in tolerably fine powder, 8 oz., and a mixture of sulphuric ether, 3 pints, with water, 5 fl. oz.; by percolation, in successive portions, like the last; the aqueous solution of tannic acid being evaporated, and finally dried at a heat not exceeding 212° Fahr.

Prop., &c. Pure tannic acid is perfectly white, but as ordinarily met with it has a slight yellowish colour, owing to the action of the air; it is uncrystallisable; possesses a powerful and purely astringent taste, without bitterness; is freely soluble in water, less so in alcohol, and only very slightly in ether; it reddens vegetable blues; when boiled with acids, it assimilates water and splits into gallic acid and grape sugar; when heated in the dry state, it suffers decomposition, metagallic and pyrogallic acids being formed; it unites with the bases, forming salts called tannates, which are characterised by striking a deep black with the persalts of iron (ink), and forming a white precipitate with gelatin.

Uses, &c. The value of substances containing tannin in the preparation of leather is well known. In its pure form it is used as an astringent in medicine; internally, in diarrhœa, hæmorrhages, as a tonic in dyspepsia, &c.; externally, made into a gargle, injection, or ointment.—*Dose.* 1 to 10 grs., in the form of pills or solution. See Gallic Acid, &c.

TAN'NIN. See Tannic Acid.

TAN'NING. When the skin of an animal, carefully deprived of hair, fat, and other impurities, is immersed in a dilute solution of tannic acid, the gelatin gradually combines with that substance as it penetrates inwards, forming a perfectly insoluble compound, which resists putrefaction completely; this is tanned leather. In practice, lime water is used for cleansing and preparing the skin, water acidulated with oil of vitriol for 'raising' or opening the pores, and an infusion of oak bark, or, sometimes, of catechu, or other astringent matter, as the source of tannic acid. The process itself is necessarily a slow one, as dilute solutions only can be safely used. Skins intended for the curriers, to be dressed for 'uppers,' commonly require about 3 weeks; and 'thick hides,' from 12 to 18 months.

Of late years various ingenious contrivances have been adopted, with more or less success, to hasten the process of tanning skins and hides. Among these may be mentioned the employment of stronger tan solutions, the application of a gentle heat, puncturing the skins to afford more ready access for the liquid to their interior parts, and maceration in the tan liquor under pressure, either at once or after the vessel containing them has been exhausted of air by means of an air-pump. On the merit of these several methods it has been remarked "that the saturated infusions of astringent barks contain much less extractive matter, in proportion to their tannin, than the weak infusions; and when the skins are quickly tanned in the former, common experience shows that it produces leather which is less durable than leather slowly formed." (Sir H. Davy.) "100 lbs. of skin, quickly tanned in a strong infusion of bark, produce 137 lbs. of leather; while 100 lbs., slowly tanned in a weak infusion, produce only 117½ lbs." "Leather thus highly (and hastily) charged with tannin is, moreover, so spongy as to allow moisture to pass readily through its pores, to the great discomfort and danger of persons wearing shoes made of it." (Ure.)

According to Mr. G. Lee, much of the original gelatin of the skin is wasted in the preliminary processes to which they are subjected, more especially the 'liming' and 'bating.' He says, that 100 lbs. of perfectly dry hide, cleaned from extraneous matter, should, on chemical principles, afford at least 180 lbs. of leather.

Morocco leather is prepared from goat or sheep skins, which, after the action of lime water and a dung bath, are slightly tanned in a bath of sumach. They are subsequently grained, polished, &c.

Russia leather is generally tanned with a decoction of willow bark, after which it is dyed, and curried with the empyreumatic oil of the birch tree. It is the last substance which imparts to this leather its peculiar odour and power of resisting mould and damp. See Leather, Tannic Acid, Tawing, &c.

TAN'TALUM. Ta. *Syn.* Columbium. A rare metal discovered by Mr. Hatchett, in 1801, in a mineral from Massachusetts; and by M. Ekeberg, in 1803, in tantalite, a mineral found in Sweden. It exists in most of its ores in combination with oxygen.

TAPE-WORM. See Worms.

TAPIO'CA. *Syn.* Tapioca (Ph. E. & D.), L. The fecula of the root of *Janipha manihot* (*Jatropha manihot*—Linn.), which has been well washed in water, and dried on hot plates, by which it assumes the appearance of warty-looking granules.

Pure tapioca is insipid, inodorous, only slightly soluble in cold water, but entirely soluble in boiling water, forming a translucent and highly nutritious jelly. Its granules are muller-shaped, about $\frac{1}{2000}$ of an inch in diameter, and display very marked hilums. It is used in a similar manner to sago and arrowroot. See Cassava.

TAR. *Syn.* Pix liquida (B. P., Ph. L. E. & D.), L. A liquid bitumen prepared from the wood of *Pinus sylvestris*, and other species, by heat. The chemical constitution of tar is very complicated. Its uses in the arts are well known. As a medicine, it is stimulant, diuretic, sudorific, and vermifuge.—*Dose.* 20 to 60 minims, made into pills with flour; in ichthyosis, &c. *Externally*, in lepra, psoriasis, foul ulcers, &c. See Ointment and Infusion.

Tar, Bar'badoes. *Syn.* Pix liquida Barbadensis, Petroleum Barbadense, Petroleum (Ph. L. & E.), L. "Black liquid bitumen, exuding spontaneously from the earth." (Ph. L.) Its properties for the most part resemble those of the last.—*Dose.* 10 to 30 drops; in asthma, chronic coughs, tape-worm, &c. *Externally*, in chilblains, chronic and rheumatic pains, &c. See Petroleum.

Tar, Coal. Produced during the distillation of bituminous coal for gas. See Naphtha, &c.

TAR COLOURS. *Syn.* Coal tar colours, Aniline colours, &c. Coal tar, the source of the aniline colours, consists of the oily fluid obtained in the destructive distillation of coal, during the manufacture of ordinary illuminating gas, and collected in a tank from the hydraulic main and condensers.

The composition of coal tar is highly complex, the most important constituents being, however, a series of homologous hydrocarbons obtained by distilling coal tar, and known as "coal naphtha." Naphtha, by rectification between 180° and 250° Fahr. (82 and 121 Cent.), yields a light yellow oily liquid, of sp. gr. ·88, the benzol of commerce.

By the action of a mixture of nitric and sulphuric acids on benzol, nitro-benzol, a heavy oily liquid with an odour of oil of bitter almonds, is obtained. In commerce this substance is made in large cast iron-pots, fitted with tight covers, and provided with stirrers worked by steam power. By means of pipes the reagents are admitted and the nitrous fumes are carried off, while the nitro-benzol and the spent reagents are drawn off from the bottom. The entire charge of benzol is first placed into the vessels, and the mixed acids are, as the reation is very energetic, cautiously run in, the whole being well stirred throughout. When finished, the contents are drawn off, and the nitro-benzol collected, washed with water, and, if necessary, neutralised with a solution of soda.

Nitro-benzol is converted into aniline in a similar apparatus, only provided with means of admitting a current of superheated steam, and condensing the aniline as it distils over. Into the vessel iron borings are placed, and acetic acid and nitro-benzol cautiously run in as the reduction is violent, stirring well all the time. A current of superheated steam is passed through, and the aniline collected as it distils over, as a pale sherry coloured oily liquid boiling at 360° Fahr. (182 Cent.), and of sp. gr. 1·02.

Mauve, the first-discovered coal tar, or aniline colour, was obtained by Mr. Perkins during some experiments directed towards the artificial formation of quinine, and was also first practically manufactured by Mr. Perkins. Commercially, mauve is made as follows:—

Aniline and sulphuric acid in proper proportions are dissolved in water in a vat by aid of heat, and when cold a solution of bichromate of potassium added, and the whole allowed to stand a day or two, when a black precipitate is obtained, which, after collecting on shallow filters, is washed and well dried. This black resinous substance is digested with dilute methylated spirit in a suitable apparatus, to dissolve out the mauve, and the major portion of the spirit distilled off. The mauve is precipitated from the aqueous solution left behind by hydrate of sodium, and after washing is either drained to a paste or dried.

The amount of mauve thus obtained is but small in comparison with the raw material, coal tar, as 100 lbs. of coal yield 10 lbs. 12 oz. of coal tar; 8½ oz. of mineral naphtha, 2¾ oz. of benzol; 4¼ oz. of nitro-benzol, 2¼ oz. of aniline, and ¼ oz. of mauve. Mauve is usually sent into the market in paste or solution, the expense of the crystals being heavy, and offering no corresponding advantages.

Other salts than the bichromate of potassium have been employed to convert aniline into mauve, as chloride of copper, permanganate of potassium, &c.; but experience has shown none to possess the same advantages as the bichromate of potassium.

Mauveine, the organic base of mauve or aniline purple, is a black crystalline powder, of the formula $C_{27}H_{24}N_3$, yielding a dull violet solution. The moment, however, mauveine is brought in contact with an acid, it turns a magnificent purple colour. The salts of mauveine form beautiful crystals possessing a splendid green metallic lustre, soluble very readily in alcohol, and less so in water. The commercial salt, or mauve, is the acetate, or sometimes the hydrochlorate.

Magenta. *Syn.* Aniline red, Roseine, Fuchsine, &c., is prepared from commercial aniline by the action of arsenic acid; the process being carried out in cast-iron pots of proper construction, placed over a furnace. Into these pots are placed 2 parts of commercial aniline containing 25 per cent. of toluidine, and 3 parts of a saturated solution of arsenic acid; the whole is well stirred, heated for a proper period, and the excess of aniline driven off by a current of superheated steam. The crude product obtained is transferred to vats, boiled with water and filtered; common salt added to the filtrate, and the precipitated magenta collected, redissolved in boiling water, refiltered, and crystallised.

This after-recrystallisation constitutes commercial magenta. Magenta consists of brilliant large crystals, having a beautiful golden-green metallic lustre, and soluble in water to an intense purplish-red solution. It is a salt of a colourless base, rosaniline, which is prepared from magenta by boiling with hydrate of potassium, and allowing the solution to cool, when it crystallises out in colourless crystals, having the formula $C_{20}H_{19}N_3H_2O$. All the salts of rosaniline have splendid purple-red colour, and that usually met with as magenta is the hydrochlorate, although the nitrate, oxalate, and acetate are also to be obtained.

From magenta or hydrochlorate of rosaniline a large number of colouring matters are produced, the most important of which will be briefly described below.

Aniline Blue, or Bleu de Lyons. This dye is prepared by heating a mixture of magenta, acetate of sodium and aniline in iron pots, provided with stirrers, &c., in an oil bath, to 374° Fahr. (190° C.), and the excess of aniline distilled over. When a good blue has been obtained, the heat is removed, and the thick treacly fluid purified. This is effected for the commoner varieties by treating the crude product with hydrochloric acid to dissolve all the excess of aniline, and the various red and purple impurities; but for the better qualities by mixing the crude product with methylated spirit, and pouring the whole into water acidulated with hydrochloric acid, and then thoroughly washing the colouring matter that is precipitated, with water and drying.

This blue, like magenta, is a salt of a colourless base, which has been named Triphenylrosaniline, $C_{38}H_{31}N_3$, or $C_{20}H_{16}(C_6H_5)_3N_3$. Aniline blue, or Lyons blue, is sent into the market either as a coarse powder of a coppery lustre, or in alcoholic solution; as it is insoluble in water, which necessitates it being added to the dye bath in solution in spirit, a great drawback.

Mr. Nicholson, by treating Lyons blue in the same manner as indigo is converted into sulpindigotic acid, has succeeded in rendering it soluble; dissolving in alkalies to form colourless salts, and decomposed by acids into its original blue colour.

By a modification of this method, "NICHOLSON BLUE" is prepared a fine soluble blue dye. Another colouring matter called Paris blue or bleu de Paris, was obtained by heating stannic chloride with aniline for 30 hours at a temperature of 356° Fahr. (180 C.). It is a fine pure blue, soluble in water, and crystallising in large blue needles with a coppery lustre.

VIOLET IMPERIAL. If the action of the aniline and magenta in the process of manufacturing aniline blue be stopped before it is finished, and the resulting product treated with dilute acid, a colouring matter called violet imperial is obtained. It is now, however, replaced by the Hoffmann violets.

HOFFMANN VIOLETS. On a large scale these violets are produced in deep cast-iron pots, surrounded by a steam jacket, and provided with a lid, having a perforation for distilling over the excess of reagents.

These vessels are charged with a solution of magenta in methylated or wood spirit, and iodide of ethyl or methyl, in proportions according to the shade required, and the whole heated by steam for five or six hours, when the excess of alcohol and iodide of ethyl is distilled over. The resulting product is dissolved in water, filtered, precipitated with common salt, and well washed.

Like most of the other colours, Hoffmann violets are salts of colourless bases. That of a red shade has a formula of $C_{22}H_{23}N_3$, or $C_{20}H_{18}(C_2H_5)N_3$; of a true violet shade, $C_{24}H_{27}N_3$, or $C_{20}H_{17}(C_2H_5)_2N_3$; and of a blue shade of violet, of $C_{26}H_{31}N_3$, or $C_{20}H_{16}(C_2H_5)_3N_3$. They are all moderately fast on wool and silk, although less so on cotton, and, as they can be produced in nearly every shade of violet, are in great use, having replaced most of the other violets.

DAHLIA. This is prepared from mauve and iodide of ethyl, in the same manner as the Hoffmann violets, and is a purple-red violet. It is a good colour, but the expense precludes its general use.

BRITANNIA VIOLET. This is obtained in the same manner as the Hoffmann violets, by acting on an alcoholic solution of magenta, with a thick, viscid, oily fluid of the formula $C_{10}H_{15}Br_3$, obtained by cautiously acting with bromine on oil of turpentine. It is a beautiful violet, capable of being manufactured of every shade, from purple to blue, and most extensively used.

ALDEHYDE GREEN. Prepared by dissolving one part of magenta in three parts of sulphuric acid, diluted with one part of water, adding by degrees one and a half part of aldehyde, and heating the whole on a water bath until a drop put in water turns a fine blue. It is then poured into a large quantity of hot water containing three parts of hyposulphite of sodium, boiled and filtered. The filtrate contains the green, which can either be kept in solution or be precipitated by means of tannic acid or acetate of sodium. Like the other colours, this green is a salt of a colourless base, containing sulphur, the formula of which is not known, and is principally used for dyeing silk, being very brilliant in both day and artificial light.

IODIDE GREEN. Produced during the manufacture of the Hoffmann colours, and is now used for dyeing cotton and silk; its colour being bluer than that of aldehyde green, it is more useful. Iodide green, not being precipitated by carbonate of sodium, is usually sold in alcoholic solution.

PERKINS' GREEN. This is also a magenta derivative, and a salt of a powerful colourless base. It resembles the iodide green, but is precipitated by alkaline carbonates and picric acid. This colour is used chiefly for calico printing, and is quite as fast as the Hoffmann colours.

Besides the above products obtained from aniline, a series of colours have been obtained from phenol, or carbolic acid, another substance obtained from coal tar.

PICRIC ACID. This is obtained by treating in a suitable apparatus, with proper precautions, carbolic acid with nitric acid. It is a pale yellow crystalline acid, forming dark orange explosive salts, and deying silk a fine yellow.

ISOPURPURATE OF POTASSIUM. By treating picric acid with cyanide of potassium a very explosive salt is obtained, used to dye wool a dark maroon colour.

AURINE, or ROSOLIC ACID. This is obtained by heating a mixture of sulphuric, oxalic, and carbolic acids, and purifying the products. It is a beautiful reddish, resinous substance, with a pale green lustre, and yielding an orange coloured solution, changed by alkalies to a splendid crimson. Owing to the difficulty in using it, however, it is not very extensively employed.

Peonine, or Coralline. This dye is formed when rosolic acid and ammonia are heated to between 248° and 284° Fahr. (120° to 140° C.). It is a fine crimson dye, forming shades similar to safflower on silk, but, owing to the bad effects of acids, not much used.

Azuline. Prepared by heating coralline and aniline together. A coppery coloured resinous substance, soluble in alcohol, and with difficulty in water, and dyeing silk a blue colour. The aniline blues, however, have superseded it to a great extent.

There are other substances obtained from coal tar that have been employed to form dyes, but of which we shall only refer to one—naphthaline. By treating this in exactly the same manner as benzol is converted into aniline, a solid crystalline white base, termed naphthylamine, is produced. From this substance is obtained the following dye.

Dinitronaphthal, or Manchester Yellow. Naphthylamine is converted into diazynaphthol by treatment with nitrite of potassium, and the latter, when heated with nitric acid, yields the colour. It is a weak acid, and the salt employed in commerce is the beautiful yellow crystalline calcium salt which dyes silk and wool a magnificent golden-yellow colour.

TARAX'ACUM. See Dandelion.

TARPAU'LIN. *Syn.* Tarpawling. Canvas covered with tar or any composition to render it waterproof.

TAR'RAS. *Syn.* Terras. A volcanic product resembling puzzolano, that imparts to mortar the property of hardening under water. Several other argillo-ferruginous minerals possess the same power, and are used under this term.

TAR'TAR. *Syn.* Argal, Orgol; Tartarum, Tartarus, L. Impure bitartrate of potassa. Crude tartar is the concrete deposit formed upon the sides of the casks and vats during the fermentation of grape juice. That obtained from white wine is white argol; that from red wine, red argol. After purification it forms cream of tartar.

Tartar, Ammo''niated. *Syn.* Ammonio-tartrate of potassa, Soluble tartar (Ammoniated); Tartarus ammoniatus, Tartarum solubile ammoniatum, L. *Prep.* Neutralise a solution of cream of tartar with ammonia in slight excess, then evaporate, and crystallise. Very soluble in water. A favourite laxative on the Continent.

Tartar, Bo''raxated. *Syn.* Soluble cream of tartar, Boro-tartrate of potassa and soda; Tartarum boraxatum, Cremor tartari solubilis, Potassæ et sodæ tartras boraxata, L. *Prep.* From borax, 2 lbs.; cream of tartar, 5 lbs.; (both in powder;) dissolved in water, evaporated, and crystallised. See Borotartrate of Potassa.

Tartar, Chalybea'ted. Potassio-tartrate of iron.

Tartar, Cream of. Bitartrate of potassa.

Tartar, Emet'ic. Potassio-tartrate of antimony.

Tartar, Oil of. Deliquesced carbonate of potassa.

Tartar, Reduced. *Syn.* Cremor tartari reductus, L. An article is sold, under the name of 'British cream of tartar,' which contains ¼ its weight or more of bisulphate of potassa.

Tartar, Salt of. Carbonate of potassa.

Tartar, Sol'uble. Neutral tartrate of potassa.

Tartar, Spirit of. Pyrotartaric acid.

TARTAR'IC ACID. $H_2C_4H_4O_6$. *Syn.* Acid of tartar, Essential salt of t.†; Acidum tartaricum (B. P., Ph. L. E. & D.), Sal essentiale tartari†, L. *Prep.* 1. (Ph. L. 1836.) Take of cream of tartar, 4 lbs.; boiling water, 2 galls.; dissolve by boiling; add, gradually, of prepared chalk, 12 oz. 7 drs. (made into a milk with water), and, when the effervescence ceases, add another like portion of prepared chalk, dissolved in hydrochloric acid, 26½ fl. oz., or q. s., diluted with water, 4 pints; collect the precipitate ('tartrate of lime'), and, after well washing it with water, boil it for 15 minutes in dilute sulphuric acid, 7 pints and 17 fl. oz.; next filter, evaporate the filtrate (to the density of 1·38), and set it aside to crystallise; redissolve the crystals in water, concentrate the solution by evaporation, and recrystallise a second and a third time. The Edinburgh formula is nearly similar. In the Ph. L. & D. tartaric acid is placed in the Materia Medica.

2. (Gatty.) The solution of argol or tartar is first neutralised with carbonate of potassa, and to every 300 galls. of the clear liquid, at 5° Twaddell, 34 galls. of milk of lime (1 lb. of lime per gall.) are added; carbonic acid gas is then forced in, with agitation; decomposition ensues, with the formation of 'bicarbonate of potassa' and 'tartrate of lime;' the last is converted into tartaric acid in the usual manner, and the former is evaporated in iron pans, and roasted in a reverberatory furnace for its potassa.

Prop. Tartaric acid forms inodorous, scarcely transparent, oblique rhombic prisms, more or less modified, which are permanent in the air; it possesses a purely sour taste, dissolves in about 2 parts of water at 60° Fahr., and in about its own weight of boiling water; it is slightly soluble in alcohol; the aqueous solution exhibits right-handed polarisation, and suffers gradual decomposition by age.

It is free from colour; is entirely, or almost entirely, dissipated by ignition; and is entirely soluble in water.

Tests. 1. Tartaric acid is known to be such by its solution giving white precipitates with solutions of caustic lime, baryta, and strontia, which dissolve in excess of the acid.—2. A solution of potassa causes a white granular precipitate of cream of tartar, soluble by agitation in excess of the precipitant.—3. Nitrate of silver and acetate of lead give white precipitates, which, when heated, fume, and yield the pure metal.—4. If to a solution of tartaric acid, or a tartrate, solution of a ferric or aluminum salt, be added, and subsequently ammonia or potassa, no precipitate is formed.—5. At about 570° Fahr. all the tartrates are blackened, and yield a peculiar and characteristic odour.

Uses, &c. Tartaric acid is chiefly employed in calico printing, and, in medicine, as a substitute for citric acid and lemon juice in the preparation of cooling drinks and saline draughts. For the latter purpose, bicarbonate of soda is the alkaline salt commonly employed.—*Dose.* 10 to 30 grains.

Concluding remarks. On the large scale the decomposition of the tartar is usually effected in a copper boiler, and that of the tartrate of lime in a leaden cistern. This part of the process is often performed by mere digestion for a few days, without the application of heat. Leaden or stoneware vessels are used as crystallisers. Good cream of tartar requires 26% of chalk and 28·5% of dry chloride of calcium for its perfect decomposition. Dry tartrate of lime requires 75% of oil of vitriol to liberate the whole of its tartaric acid. A very slight excess of sulphuric acid may be safely, nay, advantageously, employed. Some manufacturers bleach the coloured solution of the first crystals, by treating it with animal charcoal; but for this purpose the latter substance should be first purified by digesting it in hydrochloric acid, and afterwards by edulcorating it with water, and exposing it to a dull red heat in a covered vessel. The general management of this manufacture resembles that of citric acid. To obtain a large product, care must be taken that the whole of the tartrate of lime be thoroughly decomposed, a matter not always effected by clumsy manipulators, who do not adapt their quantities or practice to the circumstances before them.

TAR'TRATE. A salt of tartaric acid.

TARTS. These may be regarded as miniature pies, consisting of fruit, either fresh or preserved, baked or spread on puff-paste.

TAU'RIN. $C_2H_7NSO_3$. Obtained when purified bile is boiled for some hours with an excess of hydrochloric acid. By filtration, evaporation, and dissolving the dry residuum in about 6 parts of boiling alcohol, nearly pure taurin crystallises out as the solution cools. It forms with crystalline needles, which are soluble in water, and sparingly soluble in alcohol. It is remarkable for containing fully 25% of sulphur.

TAUROCHOLAL'IC ACID. See CHOLEIC ACID.

TAW'ING. In the preparation of the TAWED LEATHER used for gloves, housings, &c., the skins are first soaked, scraped, and hung in a warm room until they begin to exhale an ammoniacal odour, and the wool readily comes off; they are then de-haired, and soaked in water with some quicklime for several weeks, the water being changed two or three times during that period; they are then again beamed, smoothed, and trimmed, after which they are rinsed, and resoaked in a vat of bran-and-water, where they are kept in a state of gentle fermentation for some weeks; (in this state they are called 'pelts';) the skins are next well worked about in a warm solution of alum and salt, again fermented in bran-and-water for a short time, and are then stretched on hooks, and dried in a stove-room; they are, lastly, again soaked in water and trodden or worked in a pail or tub containing some yolks of eggs beaten to a froth with water, after which they are stretched and dried in a loft, and are smoothed with a warm smoothing-iron. Sometimes the process is shortened by soaking the skins in the following mixture after the first steep with bran:—Common salt, 3½ lbs.; alum, 8 lbs.; boiling water, q. s.; dissolve, add of wheaten flour, 21 lbs.; yolks of 9 dozen eggs; make a paste. For use, a portion is to be largely diluted with water.

CHAMOIS or SHAMMY LEATHER is generally prepared from either sheep or doe-skins, which, after dressing, liming, &c., are well oiled on the grain side, then rolled into balls, and thrown into the trough of the fulling-mill, where they are beaten for 2, 3, or 4 hours. They are next aired, and again oiled and fulled, and this is repeated a third time, or oftener, as circumstances may direct. The oiled skins are then exposed to a fermenting process, or heating in a close chamber, and are afterwards freed from redundant oil by being scoured in a weak alkaline lye. They are, lastly, rinsed in clean water, wrung at the peg, dried, and 'finished' at the stretcher-iron.

TAWED LEATHER differs from TANNED LEATHER in yielding size or glue under the influence of heat and moisture, in nearly the same way as the raw skins.

TEA. *Syn.* THEA, L. The dried leaves of the Chinese tea plants (*Thea Bohea* and *Thea viridis.*)

It was formerly supposed that BLACK TEAS could only be obtained from *T. Bohea*, and GREEN TEAS from *T. viridis*, but Fortune and others have proved that both sorts may be made from either species, and that the differences in colour and flavour depend chiefly on the age of the leaves and the treatment they undergo in the drying process. Another species, named *Thea Assamica*, furnishes ASSAM TEA.

Pur. The only adulteration of tea which is extensively practised at the present day is mixing it with a certain portion of exhausted tea-leaves, which have been redried and curled. The collection and preparation of these occupy several hundred persons, chiefly women and children, in and about London. The leaves which have been found in the possession of the manufacturers of imitation tea are those of the sloe tree, ash tree, elder bush, and white thorn. According to Mr. Warrington, a most extensive system of adulterating tea is practised in China. Many samples directly imported from that country, examined by him, did not contain a single grain of tea, being made up entirely of other leaves. The ordinary green teas he found, for the most part, spurious, being manufactured out of the cheaper black teas. These are 'faced up' or 'painted' with various colouring substances, powdered porcelain clay, &c., which are readily perceived under the microscope, and even admit of being separated, and chemically examined.

It is a general practice among the grocers in this country to impart what they call a 'bloom' to their green teas by 'rouncing' them up with a little calcined magnesia, or finely powdered talc or French chalk. The quantity that adheres to the tea is very trifling, but it greatly improves its appearance. Black teas are 'faced,' in a similar manner, with finely powdered plumbago or black-lead.

Pure China tea is not turned black by being put into water impregnated with sulphuretted hydrogen gas, nor does it tinge a solution of ammonia blue. The infusion is amber-coloured, and is not reddened by the addition of an acid. The ashes left from the combustion of genuine tea are white, and do not exceed 5 to 5½ %. If they exceed this they may be chemically examined with the usual tests for alumina, chromate of lead, copper, cyanide of potassium, gypsum, lime, magnesia, &c. Many of these substances may be detected by simply agitating the tea with a little cold water, when they will be detached from its surface, and render the water turbid, or, by their gravity, sink to the bottom.

Among domestic substitutes for tea are —the leaves of speedwell, wild germander, black currant, syringa or mock orange, purple-spiked willow herb, winter green, sweetbriar, cherry tree, sloe, &c., all of which are used for tea, either singly or mixed. The addition of a single bud of the black currant to the infusion of ordinary black tea imparts to it a flavour closely resembling that of green tea.

The brownish-coloured powder vended under the name of 'la veno beno' is a mixture of 2 parts of tea-dust with 5 parts of powdered catechu or terra japonica. A few grains of this substance thrown into the teapot are described in the advertisements as being capable of more than doubling the strength of the beverage.

The once notorious 'PARAQUAY PLANT,' sold in packets, was simply new meadow-hay that had been wetted with a strong infusion of catechu, then dried, chopped small, and strongly compressed. See THEINE and CAFFEINE.

Tea. "The tea is not a meal; when it is properly used, it should not be a meal; but it has a special purpose to fulfil, which I will now explain. Tea—and under the generic term tea I include coffee—tea is usually taken three hours after dinner. This is the moment which corresponds with the completion of digestion, when, the food having been conveyed away from the stomach, nothing remains behind but the excess of the acid juices employed in digestion; these acid juices create an uneasy sensation at the stomach, and a call is made for something to relieve the uneasiness; tea fulfils that object." "On the same principle, after the business of the dining-room, the antacid and refreshing beverage, either in the shape of tea or coffee, is prepared in the drawing-room. In taking either, the nearer they approach to the simple infusion the better; little milk or cream, and less sugar, should be the principle. But, seeing the purpose of tea, how unreasonable to make it the excuse for a meal, to conjoin with it toast, muffins, bread and butter, and *id genus omne*." "Three meals a day may be taken as the standard of habit and custom; tea and coffee having a specific place and purpose as a beverage, but none as a meal." (Eras. Wilson.) See MEALS, &c.

Tea, Beef. *Syn.* INFUSUM CARNIS BUBULÆ, JUSCULUM CUM CARNE BOVIS, L. This is merely a very concentrated soup formed of lean beef. According to the common plan, lean beef, 1 lb., is gently simmered in water, 1 quart, for about ½ an hour, when spices, salt, &c., are added, and in a few minutes the whole is strained for use. The following are other formulæ:—

1. (Dr. A. T. Thomson.) Take of good rump steak, ½ lb.; cut it into thin slices, spread these over a hollow dish, sprinkle a little salt on them, add a pint of boiling water, and place the dish (covered) near the fire for ½ an hour; then remove the whole to a saucepan, and boil it gently for 15 minutes; lastly, strain through a hair sieve.

2. (Prof. Liebig.) Beef, free from fat, 1 lb., is to be minced very small, mixed with an equal weight of cold water, and, after digestion and agitation in the cold for about ½ an hour, heated slowly to boiling; when it has boiled for a minute or two, strain it through a cloth. It may be coloured with roasted onion or burnt sugar, and spiced and salted to taste.

Obs. Similar preparations are ordered in some foreign Pharmacopœias from calves' lights, crayfish, frogs, mutton, pullets, snails, tortoise, veal, &c. In the Ph. L. 1746 a form was given for viper broth (JUSCULUM VIPERINUM). See ESSENCE OF BEEF, EXTRACT OF MEAT, &c.

TEETH (The). *Syn.* DENTES, L. An object very subservient to health, and which merits due attention, is the preservation of the teeth; the care of which, considering their importance in preparing the food for digestion, is, in general, far from being sufficiently appreciated. Comparatively very few persons wash their mouth and clean their teeth even once a day; a feat which ought always to be practised at the conclusion of a meal, when either animal food or vegetables are eaten; for the first is apt to leave behind it a rancid acrimony, and the other an acidity, both of them hurtful to the teeth. Those who abhor a fetid breath, rotten teeth, and the toothache, would do well to invariably clean their teeth before retiring to rest. With smokers, this practice is almost obligatory. Washing the mouth frequently with cold water is not only serviceable in keeping the teeth clean, but in strengthening the gums, the firm adhesion of which to the teeth, is of the greatest importance in preserving them sound and secure. Some persons think it serviceable to add a few drops of spirit or essence of camphor to the water thus employed, a plan we certainly approve of. See BREATH, DENTIFRICES, PASTES, POWDERS, TOOTH CEMENTS, WASHES, &c.

TEETH'ING. *Syn.* DENTITION. Children are sometimes born with one or more teeth; but, in general, the teeth, at birth, consist of mere pulpy rudiments buried in the gum. Their development is gradual. About the third or fourth month they begin to assume shape and hardness. At this period children become fretful, the saliva flows copiously, the gums grow turgid, and there is a fondness of biting hard cold objects. In nearly all cases there is more or less fever, frequently a cough or diarrhœa, and a rash commonly appears, which is called by nurses the 'red gum.' These symptoms generally abate after a fortnight or three weeks, and the child remains undisturbed until the seventh or eighth month. About this period the gums again become red, tender, and swollen, and often extremely sensitive, and painful. The upper part of the gum gradually becomes attenuated and pale, and, just before the tooth appears, even covered with a blister. These changes are usually attended by an increased flow of saliva, or 'driveling,' and a lax state of the bowels, both of which are regarded as favorable symptoms. Sometimes, however, the diarrhœa is excessive, when it may be cautiously restrained by a dose or two of rhubarb-and-magnesia, with a little dill or peppermint water; or, better, by the daily use of a little arrow-root, to which a few drops of pure port wine may be added. Sometimes the local irritation is considerable, or there are spasms or convulsions, in which case the practice is to lance the gums. When there is drowsiness, stupor, or oppressed respiration, one or two leeches may be applied to the temples, and a small blister to the back of the neck, or behind the ear. Sluggishness of the bowels may be removed by a little castor oil; or, when there is actual constipation, by a little calomel or mercurial powder and rhubarb. Excessive irritability, without other marked symptoms, is best combated by a drop or two of tincture of hops in sweetened water. Throughout the whole period of dentition the use of warm dry clothing, freedom from tight bandages, with thorough ventilation, good nursing, exercise, fresh air without undue exposure, abundance of crawling on the carpet, and frequent warm baths, will be found most advantageous. Indeed, the last, without other treatment, are often sufficient to subdue the most distressing convulsions and the most obstinate diarrhœa, and in no case can they do harm. See NURSING, STROPHULUS, &c.

TELLU'RIUM. A rare grayish-white elementary substance, found only in small quantities, associated with gold, silver, lead, and bismuth, in the gold mines of Transylvania. It has often been described as a metal, but is now commonly classed with the metalloids.

TEM'PERATURE. In English pharmacy it is customary to measure the degree of heat by Fahrenheit's thermometer. When a boiling heat is directed, 212° is meant. A gentle heat is that which is denoted by any degree between 90° and 100° Fahr.

Whenever specific gravity is mentioned, the substance spoken of is supposed to be of the temperature of 62° Fahr. (Ph. L.)

In the B. P., Ph. E. & D., and in chemical works in this country generally, the specific gravities of bodies are taken at, or referred to, the temperature of 60° Fahr. See THERMOMETERS.

TENT. A piece of lint, or compressed sponge, *used* to dilate openings, wounds, &c.

TERBIUM. A rare metal found by Prof. Mosander, associated with erbium and yttrium in ordinary yttria. See ERBIUM and YTTRIA.

TER'RA. [L.] Earth. TERRA JAPONICA, catechu; TERRA PONDEROSA, sulphate of baryta, &c.

TER'RA COT'TA. Literally, baked clay; a term applied to statues, architectural ornaments, &c., made of pure white clay, fine sand, and powdered potsherds, slowly dried, and baked to a strong hardness.

TEST. *Syn.* REAGENT. Any substance employed to determine the name or character of any other substance, or to detect its presence in compounds.

TET'ANUS. Spasm with rigidity. When it affects the under jaw, it is called TRISMUS, or locked-jaw; when the body is drawn backward by the contraction of the muscles, it is called OPISTHOTONOS; when the body is bent forward, EMPROSTHOTONOS; and when the body is drawn to one side, PLEUROSTHOTONOS.

The cause of tetanus, in temperate climates, is generally irritation of the nerves, arising from local injuries, especially punctured or lacerated wounds. Of these the most trivial are occasionally sufficient to produce locked-jaw. In hot climates the disease is occasionally produced by exposure to cold, or by suddenly suppressed perspiration. The last variety is curable; the former one, scarcely ever so. The proper treatment is a matter still undetermined. Sedatives, antispasmodics, and powerful stimulants, have each had their advocates. Large doses of wine and spirits, in conjunction with opium, have occasionally been administered with success. Electricity and the vapour bath have also proved useful. In all cases the bowels should be moved by active aperients, either by the mouth or per anum.

TET'TERS. The popular name of several cutaneous diseases, the treatment of which can only be properly undertaken by the experienced medical man.

THAL'LIUM. Tl. [Eng., L.] A heavy metal, belonging to the mercury, silver, and lead group, discovered by Crookes in the early part of 1861, and displayed by him as "a new metallic element" at the opening of the International Exhibition, on the 1st of May, 1862. Thallium is a widely diffused metal, being found in many minerals, particularly iron- and copper-pyrites and native sulphur. It has recently been obtained in comparatively large quantities from the dust of the flues leading to sulphuric acid chambers. The spectrum of thallium consists of a single most characteristic line of a beautiful green colour. The spectrum produced when the metal is burnt in the electric arc is, however, more complicated, and consists of several green, blue, and other lines.

Thallium melts at 550° Fahr., and at a less heat may be readily welded, a property that has hitherto been regarded as peculiar to iron and platinum. Its specific gravity varies from 11·8 to 11·9, according to the mode of preparation. When freshly cut it has a dull white colour, destitute of the brilliancy of polished silver. Exposed to the air, it tarnishes rapidly, a straw-coloured oxide making its appearance on the surface. The oxide is alkaline and caustic to the taste, and much more soluble than the oxides of silver and lead. The metal is remarkable for its strongly marked diamagnetic characters, resembling bismuth in this respect. The alloys of thallium are very remarkable. Copper, alloyed with only one half per cent. of thallium, becomes quite brittle; but the alloy with tin is malleable. Mr. Crookes has prepared a great number of the salts of this interesting metal. These need not be described here, as they have not yet been applied to any use in the arts.

THEBA'INE. $C_{19}H_{21}NO_3$. *Syn.* THEBAIA, PARAMORPHIA. A crystalline substance obtained by Thibourmery from an infusion of opium that has had its morphia extracted by acting on it by an excess of lime.

THE'INE. $C_8H_{10}N_4O_2$. *Syn.* THEINA. An alkaloid extracted from tea. It is identical with caffeine, and may be obtained from tea in the same manner as that substance is from coffee. The best 'gunpowder tea' contains fully 6% of theine, about one half of which is lost in the present careless mode of making infusion of tea for the table.

THENARD'S BLUE. See ULTRAMARINE (Cobaltic).

THEOBROMÆ OLEUM. *Syn.* CACAO BUTTER. A concrete oil, obtained by expression and heat from the ground seeds of *Theobroma Cacao.* Occurs in cakes of a yellowish colour, of a pleasant cacao odour. Does not become rancid from exposure to air. Contained in all the suppositories.

Not official.—The following form good bases for suppositories:—Theobroma oil, when melted, begins to solidify at 72° Fahr.; stearine of cocoa-nut oil at 75° Fahr.; 4 of stearine and 2 of mutton fat at 77° Fahr.; 4 of stearine and 1 spermaceti at 80° Fahr. Stearine alone is, perhaps, a better substance than cacao butter for making suppositories. It begins to solidify at 78° Fahr., but there is stearine that solidifies at 120 Fahr.; this will not answer for suppositories.

THEOBRO'MINE. A peculiar principle, closely resembling caffeine or theine, found by Woskresensky in the seed of the *Theobroma Cacao,* or the nuts from which chocolate is prepared, Its form is that of a light, white, crystalline powder, which is rather less soluble than caffeine. It is obtained like caffeine. See COCOA.

THERI'ACA. A name given in ancient pharmacy to varies compound medicines, chiefly electuaries or confections, employed as antidotes to poisons or infection. The THERIACA ANDROMACHI, Ph. L. 1746, contained above 60 ingredients. Mithridate and Venice treacle are examples of this class. See TREACLE.

THERMOM'ETERS. FAHRENHEIT'S scale is the one generally employed in England, while that of CELSIUS, or the CENTIGRADE scale, is principally used on the Continent. REAUMER'S is another scale occasionally employed. DE LISLE'S thermometer was formerly used in Russia, and some other parts of the north of Europe. As references to these scales are frequently met with in books, it is useful to know their relative value, and the method of reducing the one to the other. The boiling-point of water is indicated by 212° on Fahrenheit's scale, 100° on the Centigrade scale, 80° on that of Reaumur, and 0° on that of De Lisle; the freezing-point of water marks 32° Fahrenheit, and 0°, or zero, on the Centigrade and Reaumur, and 150° on the scale of De Lisle. The 0° or zero of Fahrenheit is 32° below the freezing-point of water.

1. To reduce Centigrade degrees to those of Fahrenheit, multiply them by 9, divide the product by 5, and to the quotient add 32; that is—

$$\frac{\text{Cent.}^\circ \times 9}{5} + 32 = \text{Fahr.}^\circ$$

2. To reduce Fahrenheit's degrees to Centigrade:—

$$\frac{\text{Fahr.}^\circ - 32 \times 5}{9} = \text{Cent.}^\circ$$

3. To reduce Reaumur's to Fahrenheit's:—

$$\frac{\text{Reau.}^\circ \times 9}{4} + 32 = \text{Fahr.}^\circ$$

4. To convert Fahrenheit's to Reaumer's:—

$$\frac{\text{Fahr.}^\circ - 32 \times 4}{9} = \text{Reaumur.}^\circ$$

Thermometers intended to register extreme degrees of heat are called PYROMETERS (which *see*).

THO'RIUM. Th. *Syn.* THORINUM. A very rare element, belonging to the group of earthy metals. Metallic base of thoria. It is obtained by the action of potassium on the chloride of thorium, and washing the resulting mass in water.

THORN-APPLE. See DATURA.

THROAT AFFECTIONS. We intend here only to allude to those arising from exposure or cold. The list is, therefore, a short one. CROUP, one of the most important, has been already briefly noticed.

QUINSY, or INFLAMMATORY SORE THROAT, commonly commences with stiffness and pain on one side of the throat, and swelling of the tonsils, attended by febrile symptoms, which increase as tumefaction advances, and sometimes become extreme. There is great restlessness and anxiety, considerable difficulty in swallowing even liquids, the respiration is painful and laborious, and the speech obstructed. When the inflammation is not resolved, these symptoms rapidly increase in severity, the patient suffers the greatest misery, the tumour suppurates rapidly, the abscess bursts, and with the rupture comes almost immediate relief. It occasionally happens that the other side of the throat then becomes affected, and goes through the same stages; but in general this is not the case, and the patient rapidly recovers, a few detergent gargles and a light nutritious diet being all that is required. Sometimes, at the very commencement of the attack, the inflammation may be resolved by the patient sucking a lozenge or powder, every hour or two, containing ¼ or ½ gr. of tartarised antimony carefully triturated with about 20 grs. of lump sugar, so as to keep up a constant state of nausea or vomiting for hours.

MALIGNANT SORE THROAT is marked by the inflammation of the tonsils being more superficial; but no sooner does it occur than it passes into small ulcers of varied colours and appearance, extending to the pharynx, and spreading over the whole fauces, into the nostrils, and even around the glottis and down the œsophagus. These ulcers rapidly slough, and the febrile symptoms of a typhoid character, which are present throughout, become more or less severe. In this way the disease often hastens to a fatal termination, and, being highly contagious, often extends itself to all, or nearly all, the members of a family. The treatment must be similar to that adopted for typhus fever. Stimulating gargles, containing capsicum, the mineral acids, or port wine, are useful local remedies.

THRUSH. *Syn.* APHTHA, L. A disease of infancy, which, in its common form, is marked by small white ulcers upon the tongue, palate, and gums. In some cases it extends through the whole course of the alimentary canal, and, assuming a malignant form, proves fatal. The treatment consists of a gentle emetic of ipecacuanha wine, followed by an occasional dose of rhubarb and magnesia, to keep the bowels clear, and to arrest diarrhœa. The ulceration may be touched with a little honey of borax; and if they assume a dark colour, or there be much debility, astringents and tonics should be had recourse to. In all cases the diet should be light, but supporting, as imperfect nutrition is a common cause of the disease.

TIC DOULOUREUX'. [Fr.] According to a writer in one of the medical periodicals, a solution of atropia, 2 grs., in water, 1 fl. dr., to which nitric acid, 1 drop (minim), has been previously added, applied as a paint, by means of a camel-hair pencil, to the part of the face over the spot affected, immediately and completely subdues the pain, or, at all events, within 3 to 5 minutes, in all accidental cases, and affords considerable relief in others. The application is to be continued until some relief is experienced. The solution, being very poisonous, must not be taken internally, nor applied to the skin when broken. See ATROPIA and NEURALGIA.

TIN. Sn. *Syn.* STANNUM (Ph. E. & D.), L. This metal has been known from the most remote antiquity, being mentioned in the books of Moses (*Numb.* xxxi, 22), and by Homer ('Iliad,' x, 25), and other early writers. The ancients obtained it principally, if not solely, from Cornwall. The Phœnicians traded with England for this metal at least 1000 years before the birth of Christ.

Tin occurs in nature in the state of oxide and, more rarely, as sulphide (TIN PYRITES). In Cornwall it is found under the form of peroxide (MINE-TIN, TIN-STONE), associated with copper ore, in the slate and granite rocks, and as an alluvial deposit (STREAM TIN) in the beds of rivers.

Prep., *&c.* The ore is first reduced to powder in stamping-mills, washed to remove earthy matter, and then roasted to expel arsenic and sulphur; it is next deoxidised or reduced by smelting it with about 1-6th of its weight of powdered culm, and a little slaked lime; it is, lastly, refined by 'liquation,' followed by a second smelting of the purer portion, which, after being treated in a state of fusion, for some time with billets of green wood, or 'tossed,' as the workmen call it, is allowed to settle, and is then cast into large blocks, which, after being assayed, receive the stamp of the duchy. Two varieties of commercial tin are known, called respectively grain tin and bar tin. The first is the best, and is prepared from the stream ore.

Prop. Tin approaches silver in whiteness and lustre; in hardness it is intermediate between gold and lead; it is very malleable when pure, but the presence of a very small quantity of any other metal, particularly lead, deprives it of this property; when rubbed it evolves a peculiar odour, and when bent backwards and forwards it emits a peculiar crackling noise; it melts at 442 Fahr.; volatilises at a white heat; and when heated above its melting-point, with free access of air, is speedily converted into a yellowish-white powder, which is the peroxide, or the 'putty powder' of polishers. Sp. gr. 7·29 to 7·31.

Pur. It is almost entirely dissolved by hydrochloric acid, yielding a colourless solution; the precipitate thrown down by hydrate of potassium is white, and soluble in excess of the precipitant. If it contain arsenic, brownish-black flocks will be separated during the solution, and arseniuretted hydrogen evolved, which may be inflamed and tested in the usual manner. The presence of other metals in tin may be detected by treating the hydrochloric solution with nitric acid, sp. gr. 1·16, first in the cold, and afterwards with heat, until all the tin is thrown down in the state of insoluble stannic oxide. The decanted acid solution from pure tin leaves no residuum on evaporation. If, after all the acid has been dissipated by heat, dilution with water occasion a heavy white precipitate, the sample contained bismuth; if, after dilution, a solution of sulphate of ammonium or of sodium produce a similar white precipitate (sulphate of lead), it contained lead; if ammonia, added in excess, occasion reddish-brown flocks, or if ferricyanide of potassium give a blue precipitate, it contained iron; and, if the clear supernatant liquid leave a residuum on evaporation, copper.

Tests. The stannous salts are characterised as follows:—1. Hydrate of potassium gives a bulky white precipitate, readily soluble in excess of the precipitant; on concentrating the solution, the precipitate is changed from stannous hydrate into stannic hydrate, which remains in solution, and metallic tin, which separates in brown flakes.—2. Ammonia, and the carbonates of potassium, sodium, and ammonium, give white precipitates, insoluble in excess.—3. Sulphuretted hydrogen gives, in neutral and acid solutions, a dark brown precipitate, which is soluble in hydrate of potassium, in the alkaline sulphides (especially when they contain an excess of sulphur), and in strong hot hydrochloric acid; and insoluble in nitric acid, even when boiling.—4. Sulphide of ammonium produces a like brown precipitate, soluble in excess of the precipitant, provided the latter contains an excess of sulphur.—5. Terchloride of gold gives, in the cold, on the addition of a little nitric acid, a precipitate of the purple of Cassius.—6. Mercuric chloride gives a black precipitate, but in excess it produces a white one.

Stannous Chloride. $SnCl_2$. *Syn.* PROTOCHLORIDE OF TIN. *Prep.* (ANHYDROUS.) Distil a mixture of tin and mercuric chloride. Gray, resin like, solid, fusible, and volatile.

(HYDRATED; TIN SALT.) Boil an excess of tin in hydrochloric acid. A powerful deoxidising agent. It is somewhat extensively used as a mordant in dyeing.

Stannous Iodide. SnI_2. *Syn.* PROTIODIDE OF TIN. Heat tin and iodine together. A fusible, brownish-red, translucent substance, soluble in water.

Stannous Hydrate. $Sn(HO)_2$. *Syn.* HYDRATED OXIDE OF TIN. *Prep.* Precipitate stannous chloride with carbonate of potassium, well wash, and dry under 196°. Grayish-white powder, soluble in acids and alkaline hydrates, except ammonia.

Stannous Oxide. SnO. *Syn.* PROTOXIDE OF TIN. *Prep.* Ignite the hydrate in an atmosphere of carbonic anhydride. Black powder, inflammable in air, and insoluble in acids.

Stannous Sulphide. SnS. *Syn.* PROTOSULPHIDE OF TIN. A brittle bluish-gray substance, obtained by heating tin and sulphur.

The stannous salts behave with reagents as follows:—1. Hydrate of potassium, ammonia and alkaline carbonates, give a white precipitate, which is freely soluble in an excess of hydrate of potassium and in acids, sparingly soluble in excess of ammonia, only very slightly soluble in excess of carbonate of potassium, and insoluble in excess of carbonate of ammonium.—2. Sulphuretted hydrogen gives, in acid neutral solutions, a golden-yellow precipitate, either at once or on heating the liquid, which is readily soluble in pure hydrate of potassium, the alkaline sulphides, and boiling hydrochloric acid; less soluble in ammonia, and insoluble in nitric acid.—3. A plate of metallic zinc throws down metallic tin, under the form of gray scales or a spongy mass, from solutions free from nitric acid; and from those containing free nitric acid, white stannic hydrate.—4. Mercuric chloride gives a white precipitate.—5. Ferrocyanide of potassium gives no precipitate at first, but after a time the whole forms a thick jelly.

Assay. Each grain of stannic oxide (*see above*), after being washed and gently ignited, is equivalent to ·78365 gr. of pure tin. The loss of weight represents the impurities. Each gr. of sulphate of lead, so treated, is equiv. to ·683 gr. of metallic lead (nearly).

Uses. The uses of tin in the arts are well known. In medicine, 1 to 3 drs. of the filings or powder, made into an electuary with treacle, are sometimes given in tape-worm, for 2 or 3 successive mornings, followed by an aperient.

Stannic Chloride. $SnCl_4$. *Syn.* BICHLORIDE OF TIN, TETROCHLORIDE OF TIN, PERCHLORIDE OF TIN, PERMURIATE OF T.†; STANNI BICHLORIDUM, STANNI PERMURIAS,

L. *Prep.* 1. (Liebig.) By dissolving grain tin in a mixture of hydrochloric acid, 2 parts; nitric acid and water, of each, 1 part; (all by volume;) observing to add the tin by degrees, and to allow one portion to dissolve before adding another, as without this precaution the action is apt to become violent, and stannic oxide of tin to be deposited.

2. (ANHYDROUS; LIBAVIUS'S FUMING LIQUOR.) By heating stannous chloride in chlorine gas; or, by distilling a mixture of powdered tin, 1 part, with corrosive sublimate, 3 parts (5 parts—Fownes). A very volatile, colourless, mobile liquid, which fumes in the air, and boils at 248° Fahr.; when mixed with 1-3rd of its weight of water, it solidifies to a crystalline mass.

Obs. Solution of stannic chloride is much used by dyers, under the names of 'SPIRITS OF TIN,' 'DYER'S SPIRITS,' 'TIN MORDANT,' &c., the proportions of the ingredients and the state of dilution being various according to circumstances or the caprice of the manufacturer. A process which has been highly recommended, and which seems preferable to all others, is to prepare a simple solution of the stannous chloride, and to convert it into a solution of the stannic chloride, either by the addition of nitric acid and a gentle heat, or by passing chlorine through it. See TIN MORDANTS.

Stannic Iodide. SnI_4. By dissolving stannic hydrate in hydriodic acid. Yellow, silky crystals.

Stannic Hydrate. $Sn(HO)_4$. *Syn.* HYDRATED PEROXIDE OF TIN, STANNIC ACID. *Prep.* 1. By adding hydrate of potassium or an alkaline carbonate to a solution of stannic chloride. Soluble in acids and pure alkalies, Its compounds with the latter are sometimes called STANNATES.

Stannic Oxide. SnO_2. *Syn.* BINOXIDE OF TIN, PEROXIDE OF TIN. *Prep.* By the action of nitric acid on metallic tin, the resulting white powder being well washed with water; or, by heating metallic tin above its melting-point, in the air. Yellow; anhydrous; insoluble.

Obs. Frémy has given the name of METASTANNIC ACID to the oxide prepared by the action of nitric acid on metallic tin; the hydrate he calls STANNIC ACID. See POLISHER'S PUTTY (*page* 997).

Stannic Sulphide. SnS_2. *Syn.* BISULPHIDE OF TIN, BRONZE POWDER, MOSAIC GOLD; AURUM MUSIVUM, AURUM MOSAICUM, STANNI BISULPHURETUM, L. *Prep.* 1. To pure tin, 12 oz., melted by a gentle heat, add of mercury, 6 oz.; to the powdered mass, when cold, add of chloride of ammonium, 6 oz.; flowers of sulphur, 7 oz.; and after thorough admixture place the compound in a glass flask or matrass, and gradually heat it, imbedded in sand, to low redness, and continue the heat for several hours, or until white fumes cease to be disengaged; the 'aurum musivum' remains at the bottom of the vessel, under the form of soft and very brilliant gold-coloured flakes.

2. (Berzelius.) Stannic oxide and sulphur, of each, 2 parts; chloride of ammonium, 1 part; mix, and expose it to a low red heat in a glass or earthenware retort, until sulphurous fumes cease to be evolved.

Used as a metallic gold colour, or substitute for powdered gold, in bronzes, varnish work, sealing-wax, &c.

TIN FI''LINGS. See TIN POWDER (*below*).

TIN GLASS†. See BISMUTH.

TIN MOR'DANTS. *Syn.* DYER'S SPIRIT, SOLUTION OF TIN, SPIRIT OF T., NITROMURIATE OF T.†. These, as noticed above, vary greatly in their composition and character.

Prep. 1. Take of aquafortis, 8 parts; sal ammoniac or common salt, 1 part; dissolve, and add, very gradually, of grain tin, 1 part; and, when dissolved, preserve it in stoppered bottles from the air. This is the common 'SPIRIT OF TIN' of the dyers.

2. (Berthollet.) Nitric acid, at 30° Baumé, 8 parts; sal ammoniac, 1 part; dissolve, then add by degrees, of tin, 1 part; and, when dissolved, dilute the solution with 1-4th of its weight of water.

3. (Dambourney.) Hydrochloric acid, at 17° Baumé, 4 parts; nitric acid, at 30° Baumé, 1 part; mix, and add by degrees, of Molucca tin, 1 part.

4. (Hellot.) Nitric acid and water, of each, 1 lb.; sal ammoniac, 1 oz.; nitre, ½ oz.; dissolve, then add, by degrees, of granulated tin, 2 oz.

5. (Poerner.) Nitric acid and water, of each, 1 lb.; sal ammoniac, 1½ oz.; dissolve, then add, by very slow degrees, of pure tin beaten into ribands, 2 oz.

6. (Schoeffer.) Nitric acid and water, of each, 2 lbs.; sal ammoniac, 2 oz.; pure tin, 4½ oz.; as last. All the above are used chiefly for dyeing scarlet, more particularly with cochineal.

7. (LAC SPIRIT.) From grain tin, 1 lb., slowly dissolved in hydrochloric acid (sp. gr. 1·19), 20 lbs. Recommended as a solvent for lac dye. For use, ¾ to 1 lb. of the liquid is digested on each lb. of the dye for 5 or 6 hours, before adding it to the dye bath.

8. Hydrochloric acid, 6¾ lbs.; aquafortis, ½ lb.; grain tin, gradually added, 1 lb. Recommended for lac dye.

TIN-PLATE. Iron-plate covered with a coating of tin, by dipping it into a bath of that metal.

TIN POW'DER. *Syn.* TIN FILINGS, TIN DUST; STANNI PULVIS (Ph. E. & D.), L. *Prep.* 1. (Ph. E.) Melt grain tin in an iron vessel, pour it into an earthenware mortar heated a little above its melting-point, and triturate briskly as the metal cools; lastly, sift the product, and repeat the process with what remains in the sieve.

2. (Ph. D.) Melt grain-tin in a black-lead crucible, and, whilst it is cooling, stir it with a rod of iron until it is reduced to powder

let the finer particles be separated by means of a sieve, and when, after having been several times in succession shaken with distilled water, the decanted liquor appears quite clear, let the product be dried for use.

Obs. Powdered tin is also prepared by filing and rasping.—*Dose.* 2 to 4 drs., as a vermifuge. POLISHER'S PUTTY, coloured with ivory black, is frequently substituted for this powder, and hence arises the ill effects that sometimes follow its use.

TIN'NING. *Proc.* 1. Plates or vessels of brass or copper, boiled with a solution of stannate of potassa, mixed with turnings of tin, become, in the course of a few minutes, covered with a firmly attached layer of pure tin.

2. A similar effect is produced by boiling the articles with tin filings and caustic alkali or cream of tartar.

Obs. By either of the above methods chemical vessels made of copper or brass may be easily and perfectly tinned.

TINC'TURE. *Syn.* TINCTURA, L.; TEINTURE, Fr. Tinctures (TINCTURÆ; ALCOOLÉS, ALCOOLATURES) are solutions of the active principles of bodies, obtained by digesting them in alcohol more or less dilute. ETHEREAL TINCTURES (TINCTURÆ ÆTHEREÆ; ETHÉROLÉS, ETHÉROLATURES) are similar solutions prepared with ether.

Prep. "Tinctures are usually prepared by reducing the solid ingredients to small fragments, coarse powder, or fine powder, macerating them for 7 days, or longer, in proof spirit or rectified spirit, straining the solution through linen or calico (or paper), and finally expressing the residuum strongly, to obtain what fluid is still retained in the mass. They are also advantageously prepared by the method of displacement or percolation." (Ph. E.) "All tinctures should be prepared in closed glass (or stoneware) vessels, and be shaken frequently during the process of maceration." (Ph. L.) Cooper's patent jars are very convenient for the preparation of tinctures, as they are made with wide mouths, large enough to admit the hand, and yet may be closed in an instant, with as much ease and certainty as an ordinary stoppered bottle.

Tinctures are better clarified by repose than by filtration, as in the latter case a considerable portion is retained by the filtering medium, and lost by evaporation. The waste in this way is never less than 10% of spirit. In all ordinary cases, it is sufficient to allow the tincture to settle for a few days, and then to pour off the clear supernatant portion through a funnel loosely choked with a piece of sponge or tow; after which the remaining foul portion of the liquid may be filtered through bibulous paper in a covered funnel. The filtration should be conducted as rapidly as possible, for the double purpose of lessening the amount lost by evaporation, and the action of the air on the fluid. Tinctures which have been long exposed to the air frequently lose their transparency within a few days after being filtered, owing to the oxidisement and precipitation of some portion of the matter previously held in solution, a change which occurs even in stoppered bottles. Resinous and oily tinctures, as those of myrrh, tolu, and lavender (comp.), may be generally restored to their former brightness by the addition of a quantity of rectified spirit, equal to that which they have lost by evaporation; but many tinctures resist this mode of treatment, and require refiltering.

Ethereal tinctures are best prepared by percolation, and should be both made and kept in stoppered bottles.

Qual. The tinctures of the shops are usually very uncertain and inferior preparations, owing to their manufacture being carelessly conducted, and refuse drugs and an insufficient quantity of spirit being employed in their production. It is a general practice among the druggists to substitute a mixture of equal parts of rectified spirit and water, or a spirit of about 26 u. p., for proof spirit; and a mixture of 2 galls. of water with 5 galls. of rectified spirit, for rectified spirit. In some wholesale drug-houses all the simple tinctures (except those that are of a very active or valuable kind, as LAUDANUM, for instance) are made with 1 lb. of the dry ingredient to the gal. of spirit, irrespective of the instructions in the Pharmacopœia. Appearance is the object which is alone aimed at, without reference to quality. If the tincture be perfectly transparent, and has a good colour, the conscience of the seller and the stomach of the consumer are alike satisfied.

Assay. 1. The RICHNESS in ALCOHOL may be readily determined by Brande's method of alcoholometry; but more accurately by the method of M. Gay-Lussac (see ALCOHOLOMETRY). That of tinctures containing simple extractive, saccharine, or like organic matter, in solution, may be approximately found from the boiling-point, or from the temperature of the vapour of the boiling liquid.

2. The QUANTITY of SOLID MATTER per cent. may be ascertained by evaporating to dryness 100 grains-measure, in a weighed capsule, by the heat of boiling water.

3. The QUANTITY of the INGREDIENTS used in the preparation of tinctures may be inferred from the weight last found, reference being had to the known per-centage of extract which the substances employed yield to spirit of the strength under examination. When the ingredients contain alkaloids, or consist of saline or mineral matter, an assay may be made for them.

Uses, &c. Tinctures, from the quantity of alcohol which they contain, are necessarily administered in small doses, unless in cases where stimulants are indicated. The most important and useful of them are those that contain very active ingredients, such as the tincture of opium, foxglove, hemlock, henbane, &c. In many instances the solvent, even in doses of a few fluid drachms, acts more powerfully on the living system than the principles it holds in solution; and, when continued for some time, produces the same deleterious effects as the habitual use of ardent spirits. When the action of a substance is the reverse of stimulant, it cannot with propriety be exhibited in this form, unless the dose be so small that the operation of the spirit cannot be taken into account, as with the narcotic tinctures. Hence, this class of remedies are in less frequent use than formerly.

The following list embraces all the formulæ of the tincturæ of the London, Edinburgh, Dublin, and British Pharmacopœias, with a few others likely to be useful to the reader. These will furnish examples for the preparation of others in less general use, care being had to proportionate the ingredients with due reference to the proper or usual dose of tinctures of that class.

Tincture of Ac'etate of I'ron. *Syn.* TINCTURA FERRI ACETATIS (B. P., Ph. D.), L. *Prep.* 1. (B. P.) Solution of persulphate of iron, 5; acetate of potash, 4; rectified spirit, q. s.; dissolve the acetate of potash in 20 of water and add 16 of spirit to the solution of iron; mix the two liquids, and shake well occasionally for an hour, then filter, and add to the filtered liquid sufficient rectified spirit to make up 40.—*Dose.* 5 to 30 minims.

2. (Ph. D.) To water, 9 fl. oz., add of pure sulphuric acid, 6 fl. drs.; and in the mixture, with the aid of a gentle heat, dissolve sulphate of iron, 8 oz.; next add of pure nitric acid, ½ fl. oz., previously diluted with water, 1 fl. oz., and evaporate the resulting solution to the consistence of a thick syrup; dissolve this in rectified spirit, 1 quart; also dissolve of acetate of potassa, 8 oz., in another quart of rectified spirit; and having thoroughly mixed the solutions, by frequent agitation in a large bottle, filter the whole, with expression, first through calico, and then through paper. Sp. gr. ·891.—*Dose.* 15 to 60 drops, in water, in the same cases as in the other chalybeates.

Tincture of Acetate of Zinc. *Syn.* TINCTURA ZINCI ACETATIS, L. *Prep.* (Ph. D. 1826.) Acetate of potassa and sulphate of zinc, of each, 1 oz.; rub them together, then add of rectified spirit, 16 fl. oz.; macerate for a week, and filter. Astringent. Diluted with water, it is used as a collyrium and injection.

Tincture of Ac'onite. *Syn.* TINCTURA ACONITI (Ph. L.), TINCT. ACONITI RADICIS (B. P., Ph. D.), L. *Prep.* 1. (B. P.) Powdered root, 1; rectified spirit to percolate, 8; macerate for 48 hours with three fourths of the spirit, agitating occasionally, pack in a percolator and let it drain, then pour on the remaining spirit; when it ceases to drop, press the marc and add spirit to make up 8.—*Dose.* 5 to 15 minims, twice or thrice a day.

2. (Ph. L.) Take of aconite root, coarsely powdered, 15 oz. (20 oz.—Ph. D.); rectified spirit, 1 quart; macerate for 7 days, press, and filter.

Obs. These tinctures differ materially in strength.—*Dose.* Of the Ph. L., 5 to 10 drops; of the Ph. D., 3 to 6 drops, two or three times daily (carefully watching its effects); in rheumatism, gout, syphilis, &c., where a narcotic sedative is indicated. Diluted with water, it forms an excellent embrocation in rheumatism, neuralgia, &c. It should be applied by means of a small sponge, tied to the end of a stick or glass rod. The Ph. D. formula is nearly the same as that for Dr. Turnbull's concentrated tincture of aconite root, and that given by Dr. Pereira. The TINCTURA ACONITI FOLIORUM of the Ph. U. S. is made with 1 oz. of the dried leaves to 8 fl. oz. of rectified spirit.

Tincture of Al'oes. *Syn.* TINCTURA ALOËS (B. P., Ph. L. & E.), L. *Prep.* 1. (B. P.) Socotrine aloes, 1; extract of liquorice, 3; proof spirit, 40; macerate seven days, press, and wash the marc with spirit to make 40.—*Dose.* 1 to 2 drs.

2. (Ph. L.) Socotrine or hepatic aloes, coarsely powdered, 1 oz.; extract of liquorice, 3 oz.; water, 1½ pint; rectified spirit, ½ pint; macerate for 7 days, and filter. The formula of the Ph. E. is nearly similar. Purgative and stomachic.—*Dose.* ½ to 1 fl. oz.

Tincture of Aloes (Compound). *Syn.* TINCTURE OF ALOES AND MYRRH; TINCTURA ALOËS COMPOSITA (Ph. L.), TINCTURA ALOËS ET MYRRHÆ (Ph. E.), ELIXIR ALOËS†, L. *Prep.* 1. (Ph. L. & E.) Socotrine or hepatic aloes, coarsely powdered, 4 oz.; hay saffron, 2 oz.; tincture of myrrh, 1 quart; macerate for 7 days, with occasional agitation, and strain. The Dublin College (1826) omits the saffron.

2. (Wholesale.) From aloes, 1 lb.; myrrh, ¾ lb.; hay saffron, 2 oz.; rectified spirit, 5 pints; water, 3 pints; as the last. Purgative, stomachic, and emmenagogue.—*Dose* ½ to 2 fl. drs.

Tincture of Ammo''nia (Compound). *Syn.* TINCTURA AMMONIÆ COMPOSITA (Ph. L.), L. *Prep.* 1. (Ph. L.) Mastic, 2 drs.; rectified spirit, 9 fl. drs.; digest until dissolved, decant, add, of oil of lavender, 14 drops; stronger solution of ammonia, 1 pint; and mix well.

2. (Ph. L. 1836; AQUA LUCIÆ; EAU DE LUCE.) As the last, but adding 4 drops of oil of amber along with the oil of lavender.

Obs. This preparation is reputed antacid, antispasmodic, and stimulant.—*Dose.* 10 to 20 drops, in water; in hysteria, low spirits, &c. In the East Indies, eau de luce is regarded almost as a specific for the bite of the cobra di capello and other venomous reptiles.

Tincture of Ammo''nia-chlo''ride of I'ron. *Syn.* AMMONIATED TINCTURE OF IRON, MYNSIGHT'S A. T. OF I.; TINCTURA FERRI AMMONIO-CHLORIDI (Ph. L.), TINCTURA FERRI AMMONIATI, L. *Prep.* (Ph. L.) Ammonio-chloride of iron, 4 oz.; proof spirit and distilled water, of each, 1 pint; dissolve.—*Dose.* 20 to 60 drops, or more; as a stimulant, chalybeate tonic. "A fl. oz. of this, on potassa being added, yields 5·8 grs. of sesquioxide of iron." (Ph. L.)

Tincture of Angustu'ra. Tincture of cusparia.

Tincture of Ar'nica. *Syn.* TINCTURA ARNICÆ, T. A. FLORUM, L. *Prep.* (Ph. Bor. and Hamb. Cod.) Flowers of *Arnica montana*, 1½ oz.; spirit, sp. gr. ·900 (15½ o. p.), 1 lb.; digest for 8 days, and strain, with expression. —*Dose.* 10 to 30 drops; in diarrhœa, dysentery, gout, rheumatism, paralysis, &c.

Tincture of Arnica Root. *Syn.* TINCTURA ARNICÆ (B. P.), TINCTURA ARNICÆ RADICIS, L. *Prep.* 1. (B. P.) Bruised root, 1; rectified spirit to percolate 20; macerate forty-eight hours with 15 of the spirit, agitating occasionally; pack in a perlocator, and, when it ceases to drop, pour on the remaining spirit, let it drain, wash the marc, press, filter, and make up to 20.—*Dose.* 1 to 2 drs.

2. From arnica root, 2 oz.; proof spirit, 1 pint; as the last.

Tincture, Aromat'ic. Compound tincture of cinnamon.

Tincture of Assafœt'ida. *Syn.* TINCTURA ASSAFŒTIDÆ (Ph. L. E. & D.), L. *Prep.* 1. (B. P.) Assafœtida (small fragments), 1; rectified spirit, 8; macerate seven days, strain, filter, and add spirit to make 8.—*Dose.* ½ dr. to 1 dr.

2. (Ph. L.) Assafœtida (small), 5 oz.; rectified spirit, 1 quart; macerate for 7 days (14 days—Ph. D.), and filter. "It cannot be made by percolation with delay." (Ph. E.)

3. (Wholesale.) Assafœtida, 2½ lbs.; boiling water, 2 quarts; dissolve, add of rectified spirit, 1½ gal.; agitate well for 3 or 4 days, then let it settle, and decant the clear portion.—*Dose.* ½ to 2 fl. drs.; in hysteria, flatulent colic, &c.

Tincture of Assafœtida (Ammo''niated). See FETID SPIRIT OF AMMONIA.

Tincture, Asthmat'ic. Compound tincture of camphor.

Tincture of Bal'sam of Peru. *Syn.* TINCTURA BALSAMI PERUVIANI, L. *Prep.* (Ph. L. 1788.) Balsam of Peru, 4 oz.; rectified spirit, 16 fl. oz.; dissolve. Pectoral, stimulant, and fragrant.—*Dose.* 10 to 30 drops.

Tincture of Balsam of Tolu. Tincture of Tolu.

Tincture of Bark. Tincture of cinchona.

Tincture of Belladon'na. *Syn.* TINCTURA BELLADONNÆ (B. P., Ph. L. & D.), L. *Prep.* 1. (B. P.) The dried leaves in coarse powder, 1; proof spirit, 20; macerate forty-eight hours in 15 of the spirit, agitating occasionally; pack in a percolator, and when it ceases to drop, add the remaining spirit, let it drain, wash and press the marc; filter and make up 20.—*Dose.* From 5 to 20 minims.

2. (Ph. L.) Dried leaves of belladonna, 4 oz. (5 oz., in coarse powder—Ph. D.); proof spirit, 1 quart; macerate for 7 days (14—Ph. D.), press, and filter.

3. (Wholesale.) From the dried leaves, 1 lb.; proof spirit, 1 gal.; macerate 14 days.—*Dose.* 5 to 10 drops, gradually increased; also, externally, diluted with water.

Tincture of Ben'zoin (Compound). *Syn.* FRIAR'S BALSAM, TRAUMATIC B., BALSAM FOR CUTS, COMMANDER'S BALSAM, VERVAIN'S B., WOUND B., JESUITS' DROPS, WADE'S D.; TINCTURA BENZOINI COMPOSITA (B. P., Ph. L. & E.), TINCT. BENZOËS COMP., BALSAMUM TRAUMATICUM, L. *Prep.* 1. (B. P.) Benzoin, 8; prepared storax, 6; balsam of Tolu, 2; socotrine aloes, 1½; rectified spirit, 80; macerate seven days, filter, and wash the marc with spirit to make up 80.—*Dose.* ½ to 1 dr., triturated with mucilage or yolk of egg.

2. (Ph. L.) Gum benzoin, coarsely powdered, 3½ oz.; prepared storax, 2½; balsam of Tolu, 10 drs.; Socotrine or hepatic aloes, in coarse powder, 5 drs.; rectified spirit, 1 quart; macerate, with frequent agitation, for 7 days, and strain.

3. (Ph. E.) Benzoin, 4 oz.; balsam of Peru, 2½ oz.; East Indian (hepatic) aloes, ½ oz.; rectified spirit, 1 quart.

Obs. Either of the above formulæ produces a most beautiful tincture, truly balsamic. The following is, however, very generally employed by the wholesale druggists, and the product, though possessing a very rich colour, is thin and watery.

4. (Wholesale.) From gum benzoin, 4 lbs.; aloes (lively coloured), 1½ lb.; liquid storax, 1 lb.; balsam of Tolu, ½ lb.; powdered turmeric (best), 6 oz.; rectified spirit, 5½ galls.; digest with frequent agitation for 10 days, then add of hot water, 1½ gal., again digest for 4 days, and, after 24 hours' repose, decant the clear portion.

Dose. 10 drops to 2 fl. drs.; as a stimulating expectorant, in chronic coughs, and various breath affections. It is also employed to stop the bleeding from cuts, &c., and promote their healing.

Tincture, Bitter Stomach'ic. Tincture of gentian.

Tincture, Brandish's. Alkaline tincture of rhubarb.

Tincture of Bu'chu. *Syn.* TINCTURA DIOSMÆ, T. BUCKU (Ph. E.), T. BUCHU (B. P., Ph. D.), L. *Prep.* 1. (B. P.) Buchu bruised, 1; proof spirit, 8; macerate for forty-eight hours with ¾ of the spirit, pack in a percolator, and let it drain, then pour on the rest of the spirit; when it ceases to drop, press and wash the marc, filter and make up to 8.—*Dose.* 1 to 2 drs.

2. (Ph. E.) Buchu leaves, 5 oz.; proof spirit, 1 quart; macerate 7 days (14 days—Ph. D.); or proceed by the method of percolation. —*Dose.* 1 to 4 fl. drs.; as a tonic, sudorific, and diuretic. It is inferior to the fresh infusion.

Tincture of Calum'ba. *Syn.* TINCTURA CA-

LUMBÆ (B. P., Ph. L. & E.), T. COLOMBÆ (Ph. D.), L. *Prep.* 1. (B. P.) Bruised calumba, 1; proof spirit, 8; macerate forty-eight hours with 6 of the spirit, agitating occasionally; pack in a percolator, and let it drain, then pour on the remaining spirit; when it ceases to drop, press, and wash the marc with spirit to make up 8.—*Dose.* ½ to 2 drs.

2. (Ph. L.) Calumba root, finely sliced, 3 oz.; proof spirit, 1 quart; macerate a week (14 days—Ph. D.), press, and filter. "Or, more conveniently, by percolation, allowing the calumba, in moderately fine powder, to first soak in a little of the spirit for 6 hours." (Ph. E.)

Obs. This tincture is commonly made with 1 lb. of calumba root to the gallon of a mixture of equal parts of rectified spirit and water.—*Dose.* 1 to 2 fl. drs.; as a stomachic bitter and tonic, usually joined with soda or chalybeates.

Tincture of Cam'phor. *Syn.* SPIRIT OF WINE AND CAMPHOR, CAMPHORATED SPIRIT; TINCTURA CAMPHORÆ (Ph. E. & D.), SPIRITUS CAMPHORÆ (Ph. L.), SPIRITUS CAMPHORATUS, L. *Prep.* 1. (Ph. E.) Camphor, 2½ oz.; rectified spirit, 1 quart; dissolve. This is only one half as strong as the Ph. L. preparation.

2. (Ph. D.) Camphor, 1 oz.; rectified spirit, 8 fl. oz. Stimulant and anodyne.—*Dose.* 10 to 60 drops. Also as a liniment for sprains, bruises, chronic rheumatism, &c. For the Ph. L. formula see SPIRIT.

Tincture of Camphor (Compound). *Syn.* CAMPHORATED TINCTURE OF OPIUM, ASTHMATIC ELIXIR, PAREGORIC E., ASTHMATIC TINCTURE; TINCTURA CAMPHORÆ COMPOSITA (B. P., Ph. L.), TINCTURA OPII CAMPHORATA (Ph. E. & D.), ELIXIR PAREGORICUM, L. *Prep.* 1. (B. P.) Opium, in coarse powder, 40 grs.; benzoic acid, 40 grs.; camphor, 30 grs.; oil of anise, ½ dr.; proof spirit, 20 oz.; macerate seven days, strain, wash the marc with spirit, and filter 20 oz.—*Dose.* 15 to 60 minims.

2. (Ph. L.) Camphor, 50 grs.; powdered opium and benzoic acid, of each, 72 grs.; oil of aniseed, 1 fl. dr.; proof spirit, 1 quart; macerate for 7 days, and filter. The formulæ of the Ph. E. & D. are nearly similar. The oil of aniseed, probably one of the most useful and characteristic of the ingredients, was omitted in the Ph. L. 1824, but was restored in that of 1836.

3. (Wholesale.) From powdered opium, 3 oz.; benzoic acid, camphor, and oil of aniseed, of each, 2 oz.; rectified spirit and water, of each, 3 galls.; as before.

Obs. This tincture is a popular and excellent pectoral and anodyne, where there are no inflammatory symptoms.—*Dose.* ½ to 2 fl. drs.; in troublesome coughs, &c. ½ fl. oz. contains about 1 gr. of opium.

Tincture of Canthar'ides. *Syn.* TINCTURA CANTHARIDIS (B. P., Ph. L. E. & D.), TINCTURA LYTTÆ, L. *Prep.* 1. (B. P.) Cantharides, in coarse powder, 1; proof spirit 80; macerate, agitating occasionally, for seven days, in a closed vessel, strain, press, filter, and add sufficient proof spirit to make up 80.—*Dose.* 5 to 20 minims.

2. (Ph. L.) Powdered cantharides, 4 drs. (½ oz.—Ph. D.), and strain, with expression.

3. (Wholesale.) From powdered cantharides, 2½ oz.; rectified spirit and water, of each, ½ gall.; as the last.—*Dose.* 10 drops, gradually raised to 1 fl. dr., in any bland liquid; in fluor albus, gleets, incontinence of urine, lepra, &c. It should be used with caution. The Ed. College recommends it to be prepared by displacement.

Tincture of Capsicum. *Syn.* TINCTURE OF CAYENNE PEPPER; TINCTURA CAPSICI (B.P., Ph. L. E. & D.), L. *Prep.* 1. (B. P.) Capsicum, bruised, 1; rectified spirit, 27; macerate 48 hours with three fourths of the spirit, agitating occasionally, pack in a percolator, and let it drain, then pour on the remaining spirit; as soon as it ceases to drop, wash the marc with spirit to make up 27.—*Dose.* 10 to 20 minims.

2. (Ph. L.) Capsicum, bruised, 10 drs.; proof spirit, 1 quart; digest 14 days (or percolate—Ph. E.).—*Dose.* 10 to 60 drops; in atonic dyspepsia, scarlet fever, ulcerated sore throat, &c. It is also made into a gargle.

3. (Ph. D.) Cayenne pods, bruised, 1½ oz.; proof spirit, 1 pint; macerate for 14 days. This is of fully twice the strength of the preceding.

Tincture of Capsicum (Concentrated). See ESSENCES.

Tincture of Card'amoms. *Syn.* TINCTURA CARDAMOMI (Ph. E.), TINCT. AMOMI REPENTIS, L. *Prep.* (Ph. L. 1836.) Cardamom seeds, 3½ oz. (4½ oz.—Ph. E.); proof spirit, 1 quart; digest for 14 days (or percolate—Ph. E.).

Obs. The shells should be sifted from the seeds before maceration, and the latter are preferably ground in a pepper-mill instead of being bruised in a mortar. Aromatic and carminative.—*Dose.* 1 to 2 fl. drs., as an adjunct to purgative mixtures.

Tincture of Cardamoms (Compound). *Syn.* STOMACHIC TINCTURE; TINCTURA CARDAMOMI COMPOSITA (B. P., Ph. L. E. & D.), TINCTURA STOMACHICA, L. *Prep.* 1. (B.P.) Cardamom seeds, freed from their pericarps, bruised, 1; caraway, bruised, 1; raisins, freed from their seeds, 8; bruised cinnamon, 2; cochineal, in powder, ½; proof spirit, 80; macerate 48 hours with ¾ of the spirit, agitating occasionally, pack in a percolator, and let it drain, pour upon it the remainder of the spirit, and, when it ceases to drop, press, wash the marc with spirit to make up 80.—*Dose.* ½ to 2 drs.

2. (P. L.) Cardamoms (without the shells), caraways, and cochineal, of each, bruised, 2½ drs.; cinnamon, bruised, 5 drs.; raisins, stoned, 5 oz.; proof spirit, 1 quart; macerate 7 days, then strain, with expression.

3. (Ph. E., and Ph. L. 1836.) As the last, but using only 1 dr. of cochineal, and macerating 14 days; or, "it may be prepared by the method of displacement." (Ph. E.)

4. (Wholesale.) From cardamoms and caraway seeds, of each, 4 oz.; cochineal (s. g.), 6 oz.; cassia, 8 oz.; sultana raisins, 5 lbs.; proof spirit, 4 galls. (or rectified spirit and water, of each, 2 galls.); macerate, &c., as before.

Obs. The Dublin College omitted the cochineal and raisins in their Ph. of 1826, but have restored them in their new one. The order of the London College to stone the raisins is seldom adopted in practice; by which the tincture is rendered unfit to be employed in dispensing prescriptions containing quinine or other alkaloids. When pharmaceutists are too lazy to follow the instructions in their Pharmacopœia, they had better use sultana raisins, which have no stones.—*Dose.* 1 to 4 fl. drs.; as a cordial and stomachic, but chiefly as an adjunct, for its colour and flavour.

Tincture of Cascaril'la. *Syn.* TINCTURA CASCARILLÆ (B. P., Ph. L. E. & D.), L. *Prep.* 1. (B. P.) Cascarilla, bruised, 1; proof spirit, 8; macerate 48 hours with 6 of the spirit, agitating occasionally; pack in a percolator, let it drain, and pour on the remainder of the spirit, and, when it ceases to drop, wash the marc, press, filter, and make up 8.—*Dose.* ½ to 2 drms.

2. (Ph. L.) Cascarilla, bruised, 5 oz.; proof spirit, 1 quart; macerate for 7 days (14 days—Ph. D.; or percolate—Ph. E.). An excellent tonic and stomachic; chiefly employed as an adjunct to mixtures, &c.—*Dose.* 1 to 2 fl. drs.

Tincture of Cas'sia. *Syn.* TINCTURE CASSIÆ (Ph. E.), L. *Prep.* (Ph. E.) Cassia, 3½ oz.; proof spirit, 1 quart; macerate for 7 days, or percolate. Stomachic and carminative.—*Dose.* 1 to 2 fl. drs.

Tincture of Castor. *Syn.* TINCTURA CASTOREI (B. P., Ph. L. & E.), TINCT. CASTOREI ROSSICI, L. *Prep.* 1. (B. P.) Castor, in coarse powder, 1; rectified spirit, 20; macerate seven days, strain, and wash the marc with spirit sufficient to make up to 20.—*Dose.* ½ to 1 dr.

2. (Ph. L.) Castor, bruised, 2½ oz.; rectified spirit, 1 quart; macerate for 7 days (or percolate—Ph. E.).

Obs. The Dublin College ordered Russian castor in their Ph. of 1826; but the scarcity and high price of that variety, we fear, too often precludes its use. The tincture of the shops is usually made with only 8 oz. of castor to the gal. of proof spirit. Nervine and antispasmodic.—*Dose.* 20 drops to 2 fl. drs.; in hysteria, epilepsy, &c.

Tincture of Castor (Ammo''niated). *Syn.* ELIXIR FŒTIDUM, TINCTURA CASTOREI COMPOSITA, T. C. AMMONIATA (Ph. E.), L. *Prep.* (Ph. E.) Castor, bruised, 2½ oz.; assafœtida, in small fragments, 10 drs.; spirit of ammonia, 1 quart; digest 7 days in a well-closed vessel. Stimulant and antispasmodic.—*Dose* and *uses*, as the last. With the addition of ½ oz. of opium, it forms the Elixir Uterinum, or Elixir Castorei Thebaicum of foreign Pharmacopœias.

Tincture of Cat'echu. *Syn.* COMPOUND TINCTURE OF CATECHU; TINCTURA CATECHU COMPOSITA (Ph. L.), T. CATECHU (B. P., Ph. E. & D.), L. *Prep.* 1. (B.P.) Pale catechu, in coarse powder, 2½; cinnamon, bruised, 1; proof spirit, 20: macerate for seven days with agitation, strain, press, and filter, and add spirit to make up 20.—*Dose.* ½ to 2 drms.

2. (Ph. L.) Catechu, in powder, 3½ oz. (4 oz.—Ph. D.); cinnamon, bruised, 2½ oz. (2 oz.—Ph. D.); proof spirit, 1 quart; macerate for 7 days (or percolate—Ph. E.).

3. (Wholesale.) From catechu, 2 lbs.; oil of cassia, 3 fl. drs.; rectified spirit and water, of each, 1 gal.; macerate for 10 days.—*Dose.* 1 to 2 fl. drs., as a warm astringent; in diarrhœa, &c., either alone, or combined with chalk.

Tincture of Chiret'ta. *Syn.* TINCTURA CHIRAYTÆ (B. P.), TINCTURA CHIRAYTÆ, T. CHIRETTÆ (Ph. D.), L. *Prep.* (B. P.) Chiretta, cut small and bruised, 1; proof spirit, 8; macerate 48 hours with 6 of the spirit, agitating occasionally, pack in a percolator and let it drain, then pour on the remaining spirit; when it ceases to drop, press, and wash the marc with spirit to make up 8.—*Dose.* 15 to 60 minims; B. Ph. dose ½ to 2 drs.

2. (Ph. D.) Chiretta or chirayta (bruised), 5 oz.; proof spirit, 1 quart; macerate for 14 days. Tonic and stomachic.—*Dose.* ½ to 2 fl. drs.

Tincture of Cinchona. *Syn.* TINCTURE OF BARK; TINCTURA CINCHONÆ (B. P., Ph. L. E. & D.), T. CORTICIS PERUVIANI, T. C. P. SIMPLEX, L. *Prep.* 1. (B. P.) Yellow cinchona bark, in coarse powder, 4; proof spirit, 20; macerate 48 hours with 15 of the spirit, agitating occasionally, pack in a percolator and let it drain, then pour on the remaining spirit, and when it ceases to drop, press, and wash the marc with spirit to make 20.—*Dose.* 1 to 2 drms.

2. (Ph. L.) Yellow cinchona bark (bruised), 8 oz.; proof spirit, 1 quart; macerate for 14 days (or percolate—Ph. E.).

Obs. The Dublin College orders pale bark, and the Edinburgh either species, according to prescription.—*Dose.* 1 to 3 fl. drs.; as a tonic, stomachic, and febrifuge.

Tincture of Cinchona (Pale). *Syn.* TINCTURE OF PALE BARK; TINCTURA CINCHONÆ PALLIDÆ (Ph. L.), L. *Prep.* From pale bark, as the last.

Tinctura of Cinchona (Compound). *Syn.* COMPOUND TINCTURE OF BARK, HUXHAM'S T. OF B., FEVER TINCTURE; TINCTURA CINCHONÆ COMPOSITA (B. P.), TINCTURA CINCHONÆ COMPOSITÆ (Ph. L. E. & D.), TINCT. CORTICIS PERUVIANI COMPOSITA, L. *Prep.* 1. (B. P.) Pale cinchona bark, in coarse powders; bitter orange peel, cut small and bruised, 2; serpentary, bruised, 1; Saffron, ½;

cochineal, ⅛; proof spirit, 40: macerate 48 hours with 30 of spirit, agitating occasionally, pack in a percolator and let it drain, then pour on the remainder of the spirit; when it ceases to drop, press, and wash the marc with spirit to make up 40.—*Dose.* ½ to 2 drs.

2. (Ph. L.) Pale bark, bruised, 4 oz.; dried bitter orange-peel, 3 oz. (2 oz.—Ph. D.); serpentary root, bruised, 6 drs.; hay saffron, 2 drs.; cochineal, in powder, 1 dr.; macerate for 7 days (14 days—Ph. D.; or percolate—Ph. E.); press, and filter.

3. (Wholesale.) From pale bark, 3½ lbs.; dried orange peel, 2 lbs.; serpentary root, 4 oz.; hay saffron, 1 oz.; cochineal, ½ oz.; proof spirit, 4 galls, (or rectified spirit and water, of each, 2 galls.); macerate for 14 days.

Obs. In the Ph. E. yellow bark is ordered. *Dose* and *use*, as the last.

Tincture of Cinna'mon. *Syn.* TINCTURA CINNAMOMI (B. P., Ph. L. & E.), L. *Prep.* 1. (B. P.) Cinnamon, in coarse powder, 1; proof spirit, 8; macerate 48 hours with 6 of the spirit, agitating occasionally, pack in a percolator and let it drain, then pour on the remaining spirit; when it ceases to drop, press, and wash the marc with spirit to make up 8.

2. (Ph. L.) Cinnamon, bruised, 3½ oz.; proof spirit, 1 quart; macerate for 7 days (or percolate—Ph. E.). In the shops cassia is usually substituted for cinnamon, and spirit 26 u. p. for proof spirit.—*Dose.* 1 to 4 fl. drs.; as a cordial, aromatic, and stomachic.

Tincture of Cinnamon (Compound). *Syn.* AROMATIC TINCTURE; TINCTURA CINNAMOMI COMPOSITA (Ph. L. E. & D.), T. AROMATICA, L. *Prep.* 1. (Ph. L.) Cinnamon, bruised, 1 oz.; cardamoms (bruised, without the shells), ½ oz.; long pepper and ginger, of each, 2½ drs.; proof spirit, 1 quart; digest for 7 days (or percolate—Ph. E.). The Ph. E. omits [the ginger, and uses ½ oz. more cardamoms.

2. (Ph. D.) Cinnamon, 2 oz.; cardamoms, 1 oz.; ginger, ½ oz.; proof spirit, 1 quart; macerate for 14 days. The following form is current in the wholesale houses.

3. Cassia, 1 lb.; cardamoms, 6 oz.; long pepper and ginger, of each, ¼ lb.; oil of cassia, 1½ fl. drs.; proof spirit, 4 galls. (or rectified spirit and water, of each, 2 galls.). Cordial, aromatic, stomachic.—*Dose.* 1 to 2 fl. drs.; in atonic gout, debility, flatulence, &c.

Tincture of Coch'ineal. *Syn.* TINCTURA COCCI CACTI (Ph. D.), L. *Prep.* 1. (B. P.) Cochineal, in powder, 1; proof spirit, 8: macerate 7 days; strain, and wash the marc with spirit to make up 8.—*Dose.* 30 to 90 minims twice a day. (*Used* chiefly for colouring medicines.)

2. (Ph. D.) Cochineal, in fine powder, 2 oz.; proof spirit, 1 pint. Antispasmodic and sedative; but chiefly employed for its colour.—*Dose.* ½ to 2 fl. drs.

Tincture of Col'chicum. *Syn.* GOUT TINCTURE, TINCTURE OF MEADOW SAFFRON; TINCTURA COLCHICI SEMINUM (B. P.); TINCTURA COLCHICI (Ph. L. & E.), T. SEMINUM COLCHICI (Ph. D.), L. *Prep.* 1. Colchicum seed, bruised, 1; proof spirit, 8: macerate 48 hours with 6 of the spirit, agitating occasionally, pack in a percolator, and let it drain, then pour on the remainder of the spirit; when it ceases to drop, wash the marc with spirit to make up 8.—*Dose.* 15 to 30 minims.

2. (Ph. L.) Seeds of meadow saffron (Colchicum autumnale), bruised (finely ground in a coffee-mill—Ph. E.), 5 oz.; proof spirit, 1 quart; macerate for 7 days (14 days—Ph. D.; or percolate—Ph. E.); then press, and filter.—*Dose.* 15 to 20 drops to 1 fl. dr.; in gout, &c.

Tincture of Colchicum (Compound). *Syn.* TINCTURA COLCHICI COMPOSITA (Ph. L.), SPIRITUS COLCHICI AMMONIATUS, L. *Prep.* (Ph. L.) Colchicum seeds, bruised, 5 oz.; aromatic spirit of ammonia, 1 quart; digest for 7 days, then press, and filter.—*Dose.* 20 drops to 1 fl. dr.; in gout, &c.

Tincture of Colchicum Flowers. *Syn.* TINCTURA FLORUM COLCHICI; EAU MEDICINALE D'HUSSON (Dr. Wilson). *Prep.* Take of the fresh juice of colchicum flowers, 2 parts; French brandy (or proof spirit), 1 part; mix, and in a few days decant, or filter, and preserve it in small bottles in a cool place.

Tincture of Copai'ba (Alkaline). *Syn.* TINCTURA COPAIBÆ ALKALINE, L. *Prep.* (Lewis Thompson.) Dissolve carbonate of potassa, 2 oz., in water, 1 pint, and add to this balsam of copaiba, in a thin stream, constantly stirring, until the mixture, at first white and milky, becomes clear, like jelly or amber, which will generally take place when about a pint of balsam has been added; set the mixture aside for two or three hours, then pour in of rectified spirit, 1 quart, and mix the whole together. Sweet spirit of nitre may be substituted for spirit of wine, provided it does not contain free acid.—*Dose.* 1 to 2 teaspoonfuls.

Tincture of Cu'bebs. *Syn.* ESSENCE OF CUBEBS; TINCTURA CUBEBÆ (B. P., Ph. L. & D.), TINCTURA PIPERIS CUBEBÆ, L. *Prep.* 1. (B. P.) Cubebs, in powder, 1; rectified spirit, 8: macerate 48 hours with 6 of the spirit, agitating occasionally, pack in a percolator and let it drain; pour on the remaining spirit, and when it ceases to drop, wash the marc with spirit to make up 8.—*Dose.* 1 to 2 drs.

2. (Ph. L.) Cubebs (bruised or ground in a pepper-mill), 1 lb.; proof spirit, 1 quart; macerate for 7 days, press out the liquor, and filter.—*Dose.* ½ to 1 fl. dr., three or four times a day; in gonorrhœa, &c.

3. (Ph. D., & Ph. L. 1836.) Cubebs, 5 oz.; rectified spirit, 1 quart (proof spirit—Ph. D. 1826); macerate for 14 days.—*Dose.* 1 to 2 fl. drs.

Tincture of Cuspa"ria. *Syn.* TINCTURA CUSPARIÆ (Ph. E.), T. ANGOSTURÆ, L. *Prep* (Ph. E.) Angostura bark or cusparia, 4½ oz.; proof spirit, 1 quart; digest or percolate

Tonic, stimulant, and stomachic.—*Dose.* 1 to 2 fl. drs.

Tincture of Deadly Nightshade. Tincture of belladonna.

Tincture, De Coetlogon's. Haffenden's tincture.

Tincture of Digita'lis. Tincture of fox-glove.

Tincture of Elecampane'. *Syn.* TINCTURA INULÆ, T. HELENII, L. *Prep.* (P. Cod.) Powdered elecampane, 4 oz.; proof spirit, 1 pint; macerate for 15 days. Tonic, deobstruent, and expectorant.—*Dose.* ½ to 2 fl. drs.; in dyspepsia, palsy, dropsies, uterine obstructions, &c.

Tincture of Er'got. *Syn.* TINCTURA SECALII CORNUTI TINCTURA ERGOTÆ (B. P., Ph. D.), L. *Prep.* 1. (B. P.) Ergot, bruised, 1; proof spirit, 4: macerate 48 hours with 3 of the spirit, agitating occasionally, pack in a percolator, let it drain, then pour on the remaining spirit; when it ceases to drop, wash the marc with the spirit to make up 4.—*Dose.* 15 to 60 minims.

2. (Apothecaries' Hall.) Ergot (ground in a coffee-mill), 2½ oz.; proof spirit, 1 pint; digest for 7 days.—*Dose.* A teaspoonful; to excite the action of the uterus in labour.

3. (Ph. D.) Ergot, 8 oz.; proof spirit, 1 quart; macerate for 14 days, and strain, with expression.—*Dose.* 20 drops to 1 fl. dr.; as the last.

Tincture of Ergot (Ethereal). *Syn.* TINCTURA ERGOTÆ ÆTHEREA (Ph. L.), L. *Prep.* (Ph. L.) Ergot, bruised, 15 oz.; ether, 1 quart; macerate for 7 days, press, and filter. —*Dose.* 10 drops to 1 fl. dr.

Tincture of Fox'glove. *Syn.* TINCTURA DIGITALIS (Ph. L. E. & D.), L. *Prep.* (Ph. L.) Dried foxglove leaves, 4 oz. (5 oz.—Ph. D.); proof spirit, 1 quart; macerate for 7 days (14 days—Ph. D.; or percolate—Ph. E.); then press, and strain.

Obs. This tincture is a powerful sedative, diuretic, and narcotic. The commencing dose should be 10 drops, gradually and cautiously increased to 30, or even 40; in asthmas, dropsies, fevers, phthisis, &c. "If 40 fl. oz. of spirit be allowed to pass (percolate) through, the sp. gr. will be ·944; and the solid contents of 1 fl. oz. will amount to 24 gr." (Ph. E.)

Tincture of Gal'banum. *Syn.* TINCTURA GALBANI, L. *Prep.* (Ph. D. 1826.) Galbanum, 2 oz.; proof spirit, 32 fl. oz.; digest 7 days. Stimulant and antispasmodic.—*Dose.* 1 to 3 fl. drs. "If less nauseous than tincture of assafœtida, it is also less powerful." (Dr. A. T. Thomson.)

Tincture of Galls. *Syn.* TINCTURA GALLÆ (B. P., Ph. L. & D.), TINCTURA GALLARUM (Ph. E.), L. *Prep.* 1. (B. P.) Galls, bruised, 1; proof spirit, 8: macerate for 48 hours with 6 of the spirit, agitating occasionally, pack in a percolator, let it drain, and then pour on the remaining spirit; when it ceases to drop, wash the marc with spirit to make up 8.—*Dose.* ½ to 2 drs.

2. (Ph. L.) Galls, in powder, 5 oz.; proof spirit, 1 quart; macerate for 7 days (14 days—Ph. D.); or percolate—Ph. E.); then express the liquid, and filter it. Astringent and styptic.—*Dose.* ½ to 2 fl. drs. It is chiefly used as a test for iron.

Tincture of Gen'tian (Compound). *Syn.* BITTER STOMACHIC TINCTURE; TINCTURA GENTIANÆ COMPOSITA (B. P., Ph. L. E. & D.), TINCTURA AMARA, L. *Prep.* 1. (B. P.) Gentian, bruised, 1½; bitter orange peel, bruised, ¾; cardamom seeds, bruised, ¼; proof spirit, 20; macerate for 48 hours with 15 of the spirit, agitating occasionally, pack in a percolator, let it drain, and then pour on the remaining spirit; when it ceases to drop, wash the marc with spirit to make up 20.—*Dose.* 1 to 2 drs.

2. (Ph. L.) Gentian root, sliced and bruised, 2½ oz.; dried orange peel, 10 drs.; cardamoms, bruised, 5 drs.; proof spirit, 1 quart; macerate for 7 days (or percolate—Ph. E.). The Edinburgh College substitutes canella for cardamoms, and adds of cochineal, ½ dr.

3. (Ph. D.) Gentian root, 3 oz.; dried bitter orange peel, 1½ oz.; cardamoms, ½ oz.; proof spirit, 1 quart; macerate for 14 days.

4. (Wholesale.) Gentian, 2½ lbs.; dried orange peel, 1¼ lb.; bruised cardamoms, 2½ lbs.; proof spirit, 4 galls. (or rectified spirit and water, of each, 2 galls.); digest as last.

Obs. This is an elegant and popular stomachic bitter and tonic.—*Dose.* 1 to 2 fl. drs.; in dyspepsia, loss of appetite, &c.

Tincture of Gentian (Ammo''niated). *Syn.* TINCTURA GENTIANÆ AMMONIATÆ, L.; ELIXIR ANTISCROFULEUX, Fr. *Prep.* (P. Cod.) Gentian, 1 oz.; sesquicarbonate of ammonia, ¼ oz.; proof spirit, 32 fl. oz. As the last; but preferred in acidity and low spirits.

Tincture of Gin'ger. *Syn.* TINCTURA ZINGIBERIS (B. P., Ph. L. E. & D.). *Prep.* 1. (B. P.) Ginger, bruised, 1; rectified spirit, 8; macerate the ginger 48 hours in 6 of the spirit, agitating occasionally; pack in a percolator, let it drain, pour on the remaining spirit, and when it ceases to drop press, filter, and add spirit to make 8.—*Dose.* 10 to 30 minims.

2. (Ph. L.) Ginger, bruised, 2½ oz.; rectified spirit, 1 quart; macerate for 7 days (or percolate—Ph. E.).

3. (Wholesale.) Coarsely powdered unbleached Jamaica ginger, 1¼ lb.; rectified spirit (or spirit distilled from the essence), 1½ gal.; water, ½ gal.; digest as above. Stimulant and carminative.—*Dose.* 1 to 2 fl. drs.

Obs. The formula of the Ph. D. 1826 resembles the above; that of the last Ph. D. orders 8 oz. of ginger to 1 quart of rectified spirit. The product is, consequently, of fully 3 times the strength of that of the others; and is similar to the common ESSENCE OF GINGER of the shops.

Tincture. Gout. *Syn.* TINCTURA ANTARTHRITICA, L. *Prep.* 1. (Dr. Graves's.) Take of dried orange peel and powder of aloes and canella, of each, 2 oz.; rhubarb, 1 oz.; French brandy (or proof spirit), 1 quart; digest a week, and strain, with expression.—*Dose.* 1 to 2 teaspoonfuls, night and morning.

2. (Dr. Wilson's.) Tincture of colchicum flowers.

3. Tincture of colchicum.

Tincture of Gua'iacum. *Syn.* TINCTURA GUAIACI (Ph. E. & D.), L. *Prep.* (Ph. E., & Ph. L. 1836.) Guaiacum resin (powdered), 7 oz. (8 oz.—Ph. D.); rectified spirit, 1 quart; digest for 14 days, and filter. An excellent sudorific; in chronic gout and rheumatism.—*Dose.* 1 to 3 fl. drs., taken in milk.

Tincture of Guaiacum (Compound). *Syn.* AMMONIATED TINCTURE OF GUAIACUM, VOLATILE T. OF G., RHEUMATIC DROPS; TINCTURA GUAIACI COMPOSITA (Ph. L.), T. G. AMMONIATA (B. P., Ph. E.), L. *Prep.* 1. (B. P.) Guaiac resin, in fine powder, 4; aromatic spirit of ammonia, 20; macerate 7 days, filter, and wash the filter with the spirit to make up 20.—*Dose.* ½ to 1 dr., with 1 dr. of mucilage or yolk of egg, to form an emulsion.

2. (Ph. L.) Guaiacum, in coarse powder, 7 oz.; aromatic spirit of ammonia (spirit of ammonia—Ph. E.), 1 quart; digest for 7 days, and decant or filter. A powerful, stimulating sudorific and emmenagogue; in chronic rheumatism, gout, amenorrhœa, &c.—*Dose.* 1 to 2 fl. drs., in milk, or some viscid liquid.

Tincture, Haffenden's Balsam'ic. *Syn.* DE COETLOGON'S BALSAMII TINCTURE. This is a nostrum, of many virtues, prepared from tincture of serpentary (of double strength), 1½ fl. oz; compound of tincture of benzoin, 1 fl. oz.; tinctures of tolu and opium, of each, ½ fl. oz.; with rectified spirits, q. s. to render the mixture 'bright,' should it turn milky. ('Anat. of Quackery.')

Tincture, Hatfield's. *Prep.* From gum guaiacum and soap, of each, 2 drs.; rectified spirit, 1 pint; digest for a week. *Used* as TINCTURE OF GUAIACUM; also externally.

Tincture of Hel'lebore. *Syn.* TINCTURE OF BLACK HELLEBORE; TINCTURA HELLEBORI (Ph. L.), L. TINCTURA HELLEBORI NIGRI. *Prep.* (Ph. L.) Black hellebore root, bruised, 5 oz.; proof spirit, 1 quart; macerate 7 days, then strain, with expression.

Obs. This tincture is a powerful emmenagogue, and was a favourite remedy with Dr. Mead, in uterine obstructions and certain cutaneous affections.—*Dose.* 20 drops to 1 fl. dr. See TINCTURE OF VERATRUM.

Tincture of Hem'lock. *Syn.* TINCTURA CICUTÆ, T. CONII (Ph. L. & E.), T. CONII MACULATI, L. *Prep.* 1. (Ph. L.) Dried hemlock leaves, 5 oz.; proof spirit, 1 quart; digest a week, press, and filter. In the Ph. L. 1836, cardamom seeds, 1 oz., was added.

2. (Ph. E.) Fresh hemlock leaves, 12 oz.; express the juice, bruise the residuum, and treat it, by percolation, first with tincture of cardamoms, 10 fl. oz., and next with rectified spirit, 1½ pint; mix the liquids, and filter. Deobstruent and narcotic.—*Dose* of the Ph. L., 20 to 60 drops; that of the Ph. E. tincture is less, it being a much stronger and certain preparation. See HEMLOCK.

Tincture of Hemp. Tincture of Indian Hemp.

Tincture of Hen'bane. *Syn.* TINCTURA HYOSCYAMI (B. P., Ph. L. E. & D.). *Prep.* 1. (B. P.) Hyoscyamus leaves, dried and bruised, 1; proof spirit, 8; macerate 48 hours with 6 of the spirit, pack in a percolator, and when it has drained pour on the remaining spirit, and when it ceases to drop, press, and wash the marc with spirit to make up 8.—*Dose.* 15 to 60 minims.

2. (Ph. L.) Dried leaves of henbane, 5 oz.; proof spirit, 1 quart; macerate for 7 days (14 days,—Ph. D.; or percolate—Ph. E.), then press, and filter. Anodyne, sedative, soporific, and narcotic.—*Dose.* 20 drops to 2 fl. drs.

Obs. This, as well as the TINCTURES OF FOXGLOVE, HEMLOCK, HOPS, JALAP, LOBELIA INFLATA, RHATANY, SAVINE, SQUILLS, SENNA, VALERIAN WORMWOOD, &c., is usually prepared by the druggists with 1 lb. of the dried leaves (or dried drugs) to each gal. of a mixture of equal parts of rectified spirit and water.

Tincture of Hops. *Syn.* TINCTURA LUPULI (B. P., Ph. L. & E.), TINCTURA HUMULI, L. *Prep.* 1. (B. P.) Hop, 1; proof spirit, 8; macerate 48 hours in 6 of the spirit, agitating occasionally, pack in a percolator, let it drain, add the remaining spirit, and when fluid ceases to drop, wash the marc, filter, and make up 8. —*Dose.* ½ to 2 drs.

2. (Ph. E.) Hops, 6 oz.; proof spirit, 1 quart; digest 7 days, then press, and filter. Anodyne, sedative, and soporific.—*Dose.* ½ to 2 fl. drs. For the formula of the Ph. E. and D., see TINCTURE OF LUPULIN.

Tincture, Hudson's. Tooth tincture.

Tincture, Huxham's. Compound tincture of cinchona.

Tincture of Indian Hemp. *Syn.* TINCTURA CANNABIS INDICÆ (B. P.), TINCTURA CANNABIS, T. C. INDICÆ (Ph. D.), L. *Prep.* 1. (B. P.) Extract of Indian hemp, 1; rectified spirit, 20; dissolve.—*Dose.* 5 to 20 minims with 1 dr. of mucilage, adding 1 oz. of water.

2. (Ph. D.) Purified extract of Indian hemp, ½ oz.; rectified spirit, ½ pint; dissolve. 21 drops (minims) contains 1 gr. of the extract.

Obs. The formulæ of O'Shaughnessy and the Bengal Ph. are similar.—*Dose.* 10 drops, every ½ hour, in cholera; 1 fl. dr., every ½ hour, in tetanus, till the paroxysms cease, or catalepsy is induced.

Tincture of Indian Tobac'co. Tincture of lobelia.

Tincture of I'odine. *Syn.* TINCTURA IODINEI (Ph. E.), TINCTURA IODINII, L. *Prep.* (Ph. E.) Iodine, 2½ oz.; rectified spirit, 1 quart; dissolve, and preserve it in well-closed bottles.—*Dose.* 5 to 30 drops, twice or thrice daily, where the use of iodine is indicated. Externally, as a paint, &c.

Obs. The formulæ of Magendie, the Ph. U. S., and the Paris Codex, are similar.

Tincture of Iodine (Compound). *Syn.* ANTISCROFULOUS DROPS; TINCTURA IODI (B. P.), TINCTURA IODINII COMPOSITA (Ph. L. & D.), L. *Prep.* 1. Iodine, ½; iodide of potassium, ¼; rectified spirit, 20; dissolve.—*Dose.* 5 to 20 minims. Also an excellent application to the throat in diphtheria.

2. (Ph. L. & D.) Iodine, 1 oz.; iodide of potassium, 2 oz.; rectified spirit, 1 quart; dissolve.—*Dose*, &c., as the last.

Tincture of Ipecacuan'ha. *Syn.* TINCTURA IPECACUANHA, L. *Prep.* (Ph. Bor.) Ipecacuanha (coarsely powdered), 1 oz.; spirit, sp. gr. ·897 to ·900 (16 to 17 o. p.), 8 oz.; macerate for 8 days. The tincture of the P. Cod. has twice its strength.—*Dose.* 10 or 12 drops to 2 fl. drs., according to the intention.

Tincture of Jal'ap. *Syn.* TINCTURA JALAPÆ (B. P., Ph. L. E. & D.), L. *Prep.* 1. (B. P.) Jalap, in coarse powder, 1; proof spirit, 8; macerate for 48 hours in six of the spirit, agitating occasionally, pack in a percolator, and when the fluid ceases to pass, pour on the remaining spirit, press, filter, and add spirit to make 8.—*Dose.* ½ to 2 drs.

2. (Ph. L.) Jalap, coarsely powdered, 5 oz. (10 oz.—Ph. L. 1836; 7 oz.—Ph. E.); proof spirit, 1 quart, (1½ pint,—Ph. D.); macerate for 7 days (or percolate—Ph. E.), then press, and filter. Carthartic.—*Dose.* 1 to 4 fl. drs.

Tincture of Ki'no. *Syn.* TINCTURA KINO (B. P., Ph. L. & E.), L. *Prep.* 1. (B. P.) Kino, in powder, 1; rectified spirit, 10; macerate 7 days, filter, and make up 10.—*Dose.* ½ to 2 drs.

2. (Ph. L.) Powdered kino, 3½ oz.; rectified spirit, 1 quart; macerate for 7 days (or percolate—Ph. E.), and filter. Astringent.—*Dose.* 1 to 2 fl. drs., combined with chalk mixture; in diarrhœa, &c.

Tincture of Lactuca''rium. *Syn.* TINCTURA LACTUCARII, L. *Prep.* (Ph. E.) Powdered lactucarium, 4 oz.; proof spirit, 1 quart; digest or percolate. Anodyne, soporific, antispasmodic, and sedative.—*Dose.* 20 to 60 drops; in cases for which opium is unsuited. 10 drops (minims) contain 1 gr. of lactucarium.

Tincture of Lav'ender (Compound). *Syn.* RED LAVENDER, RED LAVENDER DROPS, RED HARTSHORN; TINCTURA LAVENDULÆ COMPOSITA (B. P., Ph. L. & D.), SPIRITUS LAVANDULÆ COMPOSITUS (Ph. E.), L. *Prep.* 1. (B. P.) English oil of lavender, 90 minims; English oil of rosemary, 10 minims; cinnamon, bruised, 150 grs.; nutmeg, bruised, 150 grs.; red sandal wood, 300 grs.; rectified spirit, 40 oz.; macerate the cinnamon, nutmeg, and red sandal-wood in the spirit for 7 days, then press out and strain; dissolve the oils in the strained tincture and add sufficient rectified spirit to make 40 oz.—*Dose.* ½ to 2 drs.

2. (Ph. L.) Cinnamon and nutmegs, of each, bruised, 2½ drs.; red sanders wood, sliced, 5 drs,; rectified spirit, 1 quart; macerate for 7 days, then strain, with expression, and dissolve in the strained liquid, oil of lavender, 1½ fl. dr., oil of rosemary, 10 drops.

3. (Ph. L. 1836.) Spirit of lavender, 1½ pint; spirit of rosemary, ½ pint; red sanders wood (rasped), 5 drs.; cinnamon and nutmegs (bruised), of each, 2½ drs.; macerate for 14 days.

4. (Ph. E.) Spirit of lavender, 1 quart; spirit of rosemary, 12 fl. oz.; cinnamon, 1 oz.; nutmeg, ½ oz.; red sanders, 3 drs.; cloves, 2 drs.; as No. 1.

5. (Ph. D.) Oil of lavender, 3 fl. drs.; oil of rosemary, 1 fl. dr.; cinnamon, 1 oz.; nutmegs, ½ oz.; cloves and cochineal, of each, ¼ oz.; rectified spirit, 1 quart; macerate for 14 days.

6. (Wholesale.) From oil of cassia, ¾ fl. oz.; oil of nutmeg, 1 fl. oz.; oils of lavender and rosemary, of each, 4½ fl. oz.; red sanders (rasped), 3 lbs.; proof spirit, 6 galls. (or rectified spirit and water, of each, 3 galls.); digest 14 days. Should it be cloudy, add a little more proof spirit.

Obs. Compound tincture of lavender is a popular stimulant, cordial, and stomachic.—*Dose.* 1 to 3 teaspoonfuls (½ to 2 fl. drs.); in lowness of spirits, faintness, flatulence, hysteria, &c.

Tincture of Lem'ons. *Syn.* TINCTURA LIMONUM (Ph. L.), TINCTURA LIMONIS (B. P., Ph. D., Ph. L.), L. *Prep.* 1. (B. P.) Fresh lemon peel, sliced thin, 1; proof spirit, 8; macerate for 7 days in a closed vessel with occasional agitation, strain, press, filter, and make up with spirit to 8.—*Dose.* ½ to 2 drs.

2. Fresh lemon peel, 3½ oz. (cut thin, 5 oz. —Ph. D.); proof spirit, 1 quart; macerate for 7 days (14 days—Ph. D.), then express the liquid, and filter it. An aromatic bitter and stomachic.—*Dose.* ½ to 2 fl. drs.

Tincture of Lobe'lia. *Syn.* TINCTURE OF INDIAN TOBACCO; TINCTURA LOBELIÆ INFLATÆ, TINCTURA LOBELIÆ (B. P., Ph. L. E. & D.), L. *Prep.* 1. (B. P.) Lobelia, dried and bruised, 1; proof spirit, 8; macerate 48 hours with 6 of the spirit, agitating occasionally, pack in a percolator, and let it drain, pour on the remaining spirit, and when it ceases to drop, press and wash the marc with spirit to make up 8.—*Dose.* 10 to 30 minims, but 1 dr. may be given for dyspnœa; 4 drs. as an emetic.

2. (Ph. L.) Dried and powdered lobelia inflata, 5 oz.; proof spirit, 1 quart; macerate for 7 days (14 days—Ph. D.; or percolate—Ph. E.), press, and filter.—*Dose.* As an expectorant, 10 to 60 drops; as an emetic and antispasmodic, 1 to 2 fl. drs., repeated every third hour until it causes vomiting. It is

principally employed in spasmodic asthma, and some other pulmonary affections.

Tincture of Lobelia (Ethereal). *Syn.* TINCTURA LOBELIÆ ÆTHEREA (B. P., Ph. L. & E.), L. *Prep.* 1. Lobelia, dried and bruised, 1; spirit of ether, 8; macerate 7 days, press, and strain 8.—*Dose.* 10 to 30 minims as an antispasmodic.

2. (Ph. L.) Indian tobacco, powdered, 5 oz.; ether, 14 fl. oz.; rectified spirit, 26 fl. oz.; macerate 7 days, press, and filter.

3. (Ph. E.) Dry lobelia, 5 oz.; spirit of sulphuric ether, 1 quart; by digestion for 7 days, or by percolation.—*Dose.* 6 or 8 drops to 1 fl. dr.

4. (Whitlaw's.) From lobelia, 1 lb.; rectified spirit and spirit of nitrous ether, of each, 4 pints; sulphuric ether, 4 oz.—*Dose, &c.*, as the last.

Tincture of Lu'pulin. *Syn.* TINCTURE OF HOPS; TINCTURA LUPULI (Ph. E.), TINCTURÆ LUPULINÆ (Ph. D.) L. *Prep.* (Ph. D). Lupulin (the yellowish-brown powder attached to the scales of hops, separated by friction and sifting), 5 oz.; rectified spirit, 1 quart; macerate for 14 days (or proceed by displacement—Ph. E.), press, and filter. —*Dose.* ½ to 2 fl. drs. See TINCTURE OF HOPS.

Tincture of Mat'ico. *Syn.* TINCTURA MATICO (Ph. D.), L. *Prep.* (Ph. D.) Matico leaves, in coarse powder, 8 oz.; proof spirit, 1 quart; macerate for 14 days, and strain, with expression.—*Dose.* 1 to 2 fl. drs., as an internal astringent or hæmostatic. It is a very feeble remedy, as matico leaves are destitute of either tannin or gallic acid, and derive their power of stopping local bleeding from the peculiar mechanical construction of their surface.

Tincture of Mea'dow Saffron. Tincture of colchicum.

Tincture of Mone'sia. *Syn.* TINCTURA MONESIÆ, L. *Prep.* From monesia, 2½ oz.; proof spirit, 1 pint; macerate a week. Astringent.—*Dose.* ½ to 2 fl. drs.

Tincture of Musk. *Syn.* TINCTURA MOSCHI, L. *Prep.* (Ph. D. 1826.) Musk, 2 drs.; rectified spirit, 16 fl. oz.; digest 7 days. Antispasmodic; but principally used as a perfume, being too weak for medical use.

Tincture of Myrrh. *Syn.* GOLDEN TOOTH-DROPS; TINCTURÆ, (B. P., Ph. L. E. & D.), L. *Prep.* 1. (B. P.) Myrrh, in coarse powder, 1; rectified spirit, 8; macerate 48 hours with 6 of the spirit, agitating occasionally, pack in a percolator, and when it ceases to drop, pour on the remaining spirit, wash the marc, press, and make up to 8.—*Dose.* ½ to 1 dr. More frequently *used* mixed with water to form a gargle.

2. (Ph. L.) Myrrh, in powder, 3 oz. (3½ oz., Ph. E.; 4 oz.,—Ph. D.; rectified spirit, 1 quart; macerate for 7 days (14 days,—Ph. D.; or by displacement—Ph. E.), and filter.

3. (Wholesale.) Myrrh (in coarse powder), 2¼ lbs.; rectified spirit, 2 galls.; water, 1 gal.; as the last.

Obs. Tincture of myrrh is tonic and stimulant.—*Dose.* ½ to 1 fl. dr., as an adjuvant in mixtures, gargles, &c. Chiefly *used* diluted with water, as a dentifrice or wash for ulcerated and spongy gums.

Tincture of Myrrh. (Compound). *Syn.* TINCTURA MYRRHÆ COMPOSITA, L. *Prep.* From myrrh and Socotrine aloes, of each, 2 lbs.; rectified spirit, 3 galls.; water, 2 galls.; digest for 14 days. This is frequently substituted for 'COMPOUND TINCTURE OF ALOES' in the wholesale trade.

Tincture of Nux Vomi'ca. *Syn.* TINCTURA NUCIS VOMICÆ, L. *Prep.* 1. Nux vomica, 1 rectified spirit, 10; soften the nux vomica by steam, dry rapidly, and reduce to fine powder. Macerate 48 hours in three fourths of the spirit, agitating occasionally, pack in a percolator, let it drain, pour on the remaining spirit, and when it ceases to drop, press, filter, and make up to 10.—*Dose.* 10 to 30 minims.

2. (Ph. D. 1826.) Nux vomica (ground in a coffee-mill), 2 oz.; rectified spirit, 8 fl. oz.; macerate 7 (14) days.—*Dose.* 5 to 20 drops; in paralysis, &c. It is poisonous.

Tincture, Odontal'gic. *Syn.* TOOTHACHE TINCTURE; TINCTURA ODONTALGICA, L. *Prep.* 1. Tincture of opium, 1 fl. dr.; ether, 2 fl. drs.; oil of cloves, 15 drops.

2. Rectified spirit, 3 fl. drs.; chloroform, 2 drs.; creasote, 1 dr.; mix.

3. (Collier.) Pellitory of Spain, 4 drs.; camphor, 3 drs.; opium, 1 dr.; oil of cloves, 2 fl. drs.; rectified spirit, 16 fl. oz.; digest for a week.

4. (Niemann.) Digest 60 or 80 common lady-birds (*Coccinella septempunctata*,—Linn.) in rectified spirit, 1 fl. oz., for 8 days, and strain.

Obs. The above are commonly applied, on a small piece of lint, in toothache. For other formulæ see DROPS, TINCTURES OF MYRRH and PELLITORY, &c.

Tincture of O'pium. *Syn.* LAUDANUM, LIQUID, L., ANODYNE TINCTURE, THEBAIC T.; TINCTURA OPII,—(B. P., Ph. L. E. & D.), THEBAICA, LAUDANUM LIQUIDUM, L. *Prep.* 1. (B. P.) Opium in coarse powder, 1½; proof spirit, 20; macerate 7 days, strain, express, filter, and add spirit to make 20.—*Dose.* 10 to 30 minims.

2. (Ph. L.) Powdered opium, 3 oz. (3 oz.—Ph. D.); proof spirit, 1 quart; macerate for 7 days (14 days — Ph. D.), and strain, with expression.

3. (Ph. E.) Opium, sliced, 3 oz.; boiling water, 13½ fl. oz.; digest, with heat, for 2 hours, break down the opium with the hand, strain, and express the infusion; then macerate the residuum for about 20 hours in rectified spirit, 1 pint 7 fl. oz.; next strain, press, mix the watery and spirituous infusions, and filter.

Obs. This preparation has a deep brownish-red colour, and the characteristic odour and taste of opium. 14 minims or measured drops of the London, and about 15 minims of the Edinburgh and Dublin tinctures, are equivalent to 1 gr. of dry opium, or 1·12 gr. of ordinary opium. 14 minims of this tincture are equal to about 25 drops of it poured from a bottle. Its sp. gr. is ·952. (Phillips.)—*Dose.* 10 to 60 drops; as an anodyne, sedative, or hypnotic. The following form is substituted for that of the Pharmacopœia by many of the wholesale drug houses:—Take of Turkey opium, 2¼ lbs.; boiling water, 9 quarts; digest till dissolved or disintegrated, cool; add of rectified spirit, 2 galls.; and, after repose for 24 hours, decant the clear portion. *Prod.* 4 galls.

Tincture of Opium (Ammo′niated). *Syn.* AMMONIATED TINCTURE OF OPIUM, SCOTCH PAREGORIC; TINCTURA OPII AMMONIATA (B. P., Ph. E.), L. *Prep.* 1. (B. P.) Opium in powder, 100 grs.; saffron, cut small, 180 grs.; benzoic acid, 180 grs.; oil of anise, 60 minims; strong solution of ammonia, 4 oz.; rectified spirit, 16 oz.; macerate 7 days in a closed vessel, with occasional agitation, strain, and add sufficient rectified spirit to make up 20 oz.—*Dose.* ½ to 1 dr.

2. (Ph. E.) Benzoic acid and hay saffron, of each, 6 drs.; opium, sliced, 4 drs.; oil of aniseed, 1 dr.; spirit of ammonia (Ph. E.), 1 quart; digest for a week, and filter. Stimulant, antispasmodic, and anodyne.—*Dose.* 20 to 80 drops; in hysteria, hooping-cough, &c.

Obs. This preparation is called 'PAREGORIC,' or 'PAREGOIC ELIXIR,' in Scotland, but should be carefully distinguished from the compound tincture of camphor, which passes under the same names in England; as the former contains about 4 times as much opium as the latter. 80 minims, or 145 poured drops, contain about 1 gr. of opium.

Tincture of Opium (Cam′phorated). Compound tincture of camphor.

Tincture of Or′ange Peel. *Syn.* TINCTURA AURANTII (B. P., Ph. L. E. & D.), T. CORTICIS AURANTII, L. *Prep.* 1. (B. P.) Dried bitter orange peel, cut small and bruised, 1; proof spirit, 10; macerate for 7 days in a closed vessel with occasional agitation, then strain, press, and filter, add sufficient proof spirit to make 10.—*Dose.* 1 to 2 drs.

2. (Ph. L.) Dried orange peel, 3½ oz. (4 oz.—Ph. D.); proof spirit, 1 quart; digest for 7 days (14 days—Ph. D.; or by percolation—Ph. E), press, and filter. A grateful bitter stomachic.—*Dose.* 1 to 3 fl. drs.; chiefly as an adjuvant in mixtures, &c.

Tincture of Pel′litory. *Syn.* TOOTHACHE TINCTURE; TINCTURA PYRETHRI, B. P. *Prep.* 1. (B. P.) Pellitory root, in coarse powder, 4; rectified spirit, 20; macerate for 48 hours with 15 of the spirit, agitating occasionally, then pack in a percolator, let it drain, and pour on the remaining spirit; when it ceases to drop, press, filter, and make up to 20.

2. Pellitory of Spain (bruised), 1 oz.; rectified spirit, ¼ pint; digest a week. In the P. Cod. a tincture is ordered prepared with spirit about 41 o. p., and another prepared with spirit of sulphuric ether.

3. (COMPOUND.—Brande.) Pellitory root, 4 drs.; camphor, 3 drs.; oil of cloves, 2 drs.; opium, 1 dr.; rectified spirit, 6 fl. oz.; digest for eight days. Both the above are used for the toothache. See ODONTALGIC TINCTURE.

Tincture of Phos′phorus (Ethereal). *Syn.* ÆTHER PHOSPHORATUS, TINCTURA PHOSPHORI ÆTHEREA, L. *Prep.* 1. Ph. Hann. 1831.) Phosphorus (powdered by agitation with rectified spirit), 16 grs.; ether, 2 oz.; macerate, with agitation, for 4 days, then decant the clear portion, and preserve it in a stoppered bottle, in a cool dark situation.

2. (P. Cod.) Phosphorus, cut small, 1 part; ether, 50 parts; digest, with occasional agitation, for 1 month, and decant the clear.—*Dose.* 5 to 15 drops, in any bland vehicle, thrice daily; in impotency, low sinking conditions of the system, &c.

Tincture of Quas′sia. *Syn.* TINCTURA QUASSIÆ (B. P., Ph. E.), L. *Prep.* 1. (B. P.) Quassia in chips, ¾; proof spirit, 20; digest 7 days, filter, and make up to 20.—*Dose.* 1 to 2 drs.

2. (Ph. E.) Quassia, in chips, 10 drs.; proof spirit, 1 quart; digest 7 days. Bitter, tonic.—*Dose.* ½ to 2 fl. drs.; in dyspepsia, &c.

Tincture of Quassia (Compound). *Syn.* TINCTURA QUASSIÆ COMPOSITA (Ph. E.), L. *Prep.* (Ph. E.) Cardamoms and cochineal, of each, bruised, ½ oz.; powdered cinnamon and quassia chips, of each, 6 drs.; raisins, 7 oz.; proof spirit, 1 quart; digest for 7 days (or by percolation), then press, and filter. Aromatic and tonic.—*Dose* and *use*, as the last.

Tincture of Quinine′ (Compound). *Syn.* FEVER DROPS; TINCTURA QUINÆ, B. P.; TINCTURA QUINÆ COMPOSITA (Ph. L.) *Prep.* 1. (B. P.) Sulphate of quinia, 1; tincture of orange peel, 60; dissolve with a gentle heat, digest for 3 days with occasional agitation, and strain.—*Dose.* 1 to 1½ dr.

2. (Ph. L.) Sulphate of quinine, 5 drs. 1 scrup. (or 320 grs.); tincture of orange peel, 1 quart; digest, with agitation, for 7 days, or until solution is complete.

Obs. Unless the tincture employed as the solvent be of the full strength, some of the disulphate remains undissolved. It is an excellent medicine when faithfully prepared.—*Dose.* ½ to 2 fl. drs.; in debility, dyspepsia, &c.

Tincture of Red Lav′ender. Compound tincture of lavender.

Tincture of Rhat′any. *Syn.* TINCTURA KRAMERIÆ (B. P., Ph. D.), L. *Prep.* 1. (B. P.) Rhatany, bruised, 1; proof spirit, 8; macerate 48 hours in 6 of the spirit, agitating occasionally, pack in a percolator; when it ceases to drop, pour on the remaining spirit, and wash the marc with spirit to make up 8.—*Dose.* 1 to 2 drs.

2. (Ph. D.) Rhatany root, in coarse powder, 8 oz.; proof spirit, 1 quart; macerate for 14 days, then press, and filter. Astringent.—*Dose.* 1 to 2 fl. drs. The formula of the Ph. U. S. is similar.

Tincture of Rhu′barb. *Syn.* TINCTURA RHEI (B. P., Ph. E.), L. *Prep.* 1. (B. P.) Rhubarb, bruised, 2; cardamom seeds, bruised, ¼; coriander, bruised, ¼; saffron, ¼; proof spirit, 20; macerate for 48 hours with 15 of the spirit, agitating occasionally, pack in a percolator, and when it ceases to drop pour on the remaining spirit, press and wash the marc, and add spirit to make up 20.—*Dose.* As a stomachic, 1 to 2 drs.; as a purgative, ½ to 1 oz.

2. (Ph. E.), Powdered rhubarb, 3½ oz.; cardamom seeds, bruised, ½ oz.; proof spirit, 1 quart; digest, or proceed by the method of displacement.

3. (Ph. L. 1824.) Rhubarb, 2 oz.; cardamoms, 4 drs.; saffron, 2 drs.; proof spirit, 32 fl. oz. Both the above are cordial, stomachic, and laxative.—*Dose.* 1 fl. dr. to 1 fl. oz.

Tincture of Rhubarb (Compound) *Syn.* TINCTURA RHEI COMPOSITA (Ph. L. & D.) *Prep.* 1. (Ph. L.) Rhubarb, sliced, 2½ oz.; liquorice root, bruised, 6 drs.; ginger (bruised) and hay saffron, of each, 3 drs.; proof spirit, 1 quart; macerate for 7 days, then press, and filter.

2. (Ph.) Rhubarb, 3 oz., cardamoms, 1 oz.; liquorice root, ½ oz.; saffron, ¼ oz.; proof spirit, 1 quart; macerate for 14 days.

3. (Ph. L.) 1824. Rhubarb, 2 oz.; liquorice root, 4 drs.; ginger and saffron, of each, 2 drs.; proof spirit, 16 fl. oz.; water, 12 fl. oz.

Obs. This tincture is a popular remedy in diarrhœa and colic, and is an especial favourite with drunkards.—*Dose,* as a stomachic, 1 to 3 fl. drs.; as a purgative, ½ to 1½ fl. oz. The tincture of rhubarb of the shops is mostly inferior, being generally deficient both in rhubarb and spirit. The following forms we have seen extensively employed in the wholesale trade:—East Indian rhubarb, 20 lbs.; boiling water, q. s. to cover it; infuse for 24 hours, then slice the rhubarb, and put it into a cask with moist sugar, 14 lbs.; ginger, bruised, 3½ lb.; hay saffron, 1 lb.; carbonate of potash, ½ lb.; bruised nutmegs, ¼ lb.; rectified spirit, 19 galls.; water, 21 galls.; macerate with frequent agitation for 14 days, decant the clear portion, and press and filter the bottoms. Those houses that adhere to the Ph. L. for 1824 substitute cardamom seeds, 5 lbs., for the ginger. For the corresponding Ph. E. formula see the last article.

Tincture of Rhubarb (Brandish's Al′kaline). *Syn.* TINCTURA RHEI ALKALINA BRANDISHII, L. *Prep.* From rhubarb, in coarse powder, 1½ oz.; Brandish's alkaline solution, 1 quart; macerate for a week. In the original formula only ½ oz. of rhubarb is ordered.—*Dose.* 20 drops to 2 fl. drs., in any bland liquid, not acidulous; in acidities, dyspepsia, &c.

Tincture of Rhubarb and Al′oes. *Syn.* SACRED ELIXIR†; TINCTURA RHEI ET ALÖES, (Ph. E.), L. *Prep.* (Ph. D.) Rhubarb, in powder 1½ oz.; Socotrine or East Indian aloes, 6 drs.; cardamom seeds, bruised, 5 drs.; proof spirit, 1 quart; macerate 7 days, or percolate. A warm stomachic purgative.—*Dose.* ½ fl. oz. to 1 fl. oz.

Tincture of Rhubarb and Gen′tian. TINCTURA RHEI AMARA, TINCTURA RHEI ET GENTIANÆ (Ph. E.), L. *Prep.* (Ph. E.) Rhubarb, 2 oz.; gentian, ½ oz.; proof spirit, 1 quart; proceed as for the last. Stomachic, tonic, and purgative.—*Dose.* 1 fl. dr. to 1 fl. oz.

Tincture of Rhubarb and Sen′na. *Syn.* WARNER'S GOUT CORDIAL; TINCTURA RHEI ET SENNÆ (Ph. U. S.), L. *Prep.* (Ph. U. S.) Rhubarb, 1 oz.; senna and red sanders wood, of each, 2 drs.; coriander and fennel seed, of each, 1 dr.; saffron and extract of liquorice, of each, ½ dr.; stoned raisins, 6 oz.; proof spirit, 2½ pints; macerate for 14 days. A popular stomachic and laxative.—*Dose.* ½ to 1½ fl. oz.

Tincture, Riemer's Nervous. *Prep.* From oil of juniper, 1 part; volatile liquor of hartshorn, 4 parts; rectified spirit, 16 parts.—*Dose.* 1 teaspoonful, in water.

Tincture, Ruspini's. Tooth tincture.

Tincture of Saf′fron. *Syn.* TINCTURA CROCI (B. P., Ph. E. & D.), T. C. SATIVÆ, L. *Prep.* 1. (B. P.) Saffron, 1; proof spirit, 20; macerate 48 hours with 15 of the spirit, agitating occasionally, pack in a percolator, let it drain, and then pour on the remaining spirit; when it ceases to drop, wash the marc with spirit to make up 20.—*Dose* ½ to 2 drs.

2. (Ph. E.) Hay saffron, 2 oz. (2 oz.—Ph. D.); proof spirit, 1 quart (1 pint—Ph. D.); proceed either by maceration (for 14 days—Ph. D.) or by displacement. Stimulant, and emmenagogue.—*Dose.* 1 to 2 fl. drs. Chiefly used for its colour and flavour.

Tincture of Senna (Compound). *Syn.* TINCTURE OF SENNA, ELIXIR OF HEALTH†; TINCTURA SENNÆ (B.P.), TINCTURA SENNÆ COMPOSITÆ (Ph. L. E. & D.), L. *Prep.* 1. (B. P.) Senna, broken small, 5; raisins, freed from seeds, 4; caraway, bruised, 1; coriander, bruised, 1; proof spirit, 40; macerate the ingredients 48 hours in three fourths of the spirit, agitating occasionally; pack in a percolator, and when it ceases to drop, pour on the remaining spirit; press, filter, and make up 40.—*Dose.* 2 to 8 drs.

2. (Ph. L.) Senna, 3½ oz.; caraway seeds, bruised, 3½ drs.; cardamom seeds, bruised, 1 dr.; stoned raisins, 5 oz.; proof spirit, 1 quart; macerate for 7 days, press, and filter.

3. (Ph. E.) Senna and stoned raisins, of each, 4 oz.; sugar, 2½ oz.; corianders, 1 oz.;

jalap, 6 drs.; caraways and cardamoms, of each, 5 drs.; proof spirit, 1 quart; digest, or proceed by percolation.

4. (Ph. D.) Senna, 4 oz.; caraway and cardamom seeds, of each, bruised, ½ oz.; proof spirit, 1 quart; macerate for 14 days.

5. (Wholesale.) From senna, 6 lbs.; treacle, 2 lbs.; caraways, ¾ lb.; cardamoms, ¼ lb.; rectified spirit and water, of each, 4 galls.; as before. Carminative, stomachic, and purgative.—*Dose.* ½ to 1 fl. oz.

Obs. "If Alexandrian senna be used for this preparation, it must be freed from cynanchum (argel) leaves, by picking." (Ph. E.)

Tincture of Ser'pentary. *Syn.* TINCTURE OF VIRGINIAN SNAKE ROOT; TINCTURA SERPENTARIÆ (B. P., Ph. L. & E.), L. *Prep.* 1. (B. P.) Serpentary, bruised, 1; proof spirit, 8; macerate 48 hours, with 6 of the spirit, agitating occasionally, pack in a percolator and let it drain; pour on the remaining spirit, and when it ceases to drop, press, and wash the marc to make up 8.—*Dose.* ½ to 2 drs.

2. (Ph. L.) Serpentary, bruised, 3½ oz. (cochineal, 1 dr.—Ph. E.); proof spirit, 1 quart; macerate for 7 days (or by percolation —Ph. E.), strain, and filter. Stimulant, tonic, and diaphoretic.—*Dose.* 1 to 3 fl. drs.

Tincture of Sesquichlo"ride of Iron. *Syn.* TINCTURE OF MURIATE OF IRON, TINCTURE OF STEEL, STEEL DROPS; TINCTURA FERRI PERCHLORIDI (B. P.), TINCTURA FERRI SESQUICHLORIDI (Ph. L. & D.), T. FERRI MURIATIS (Ph. E.), FERRI MURIATIS LIQUOR, L. *Prep.* 1. (B. P.) Strong solution of perchloride of iron, 1; rectified spirit, 3: mix.—*Dose.* 10 to 30 minims in water.

2. (Ph. L.) Sesquioxide of iron, 6 oz.; hydrochloric acid, 1 pint; mix, and digest in a sand bath, frequently shaking (with a gentle heat, for a day—Ph. E.), until solution is complete, then add, when cold, of rectified spirit, 3 pints, and (in a short time) filter. Sp. gr. ·992. "1 fl. oz., potash being added, deposits nearly 30 grs. of sesquioxide of iron." (Ph. L.)

3. (Ph. D.) Iron wire, 8 oz.; pure hydrochloric acid, 1 quart; distilled water, 1 pint; mix, and dissolve by a gentle heat; next add, in successive portions, of pure nitric acid, 18 fl. drs.; evaporate by a gentle heat to a pint, and, when cold, mix this in a bottle with rectified spirit, 1½ pint; lastly, after 12 hours, filter. Sp. gr. 1·237.

Obs. This tincture is an active ferruginous tonic.—*Dose.* 10 to 30 drops, gradually increased, taken in water, ale, or wine. In the old tinctura martis, Ph. L., iron filings, and in the T. ferri muriatis, Ph. E. 1817, black oxide of iron, were used instead of the sesquioxide or carbonate. 'Bestuchef's nervine tincture of the P. Cod. is prepared by dissolving 1 dr. of dry sesquichloride of iron in 7 drs. of spirit of sulphuric ether. See GOLDEN DROPS.

Tincture of Sesquini'trate of Iron‡. *Syn.* TINCTURA FERRI SESQUINITRATIS, L. *Prep.* (Onion.) Iron filings, ½ oz.; nitric acid (1·5), 2½ oz.; dissolve, add of hydrochloric acid (1·16), 6 drs., simmer for 2 or 3 minutes, cool, add of rectified spirit, 8 oz., and filter. Proposed as a substitute for the last preparation, but the name misrepresents its chemical constitution.

Tincture of Squills. *Syn.* TINCTURA BECHICA, TINCTURA SCILLÆ (B. P., Ph. L. E. & D.), L. *Prep.* 1. (B. P.) Dried squill, bruised 1; proof spirit, 8; macerate for 48 hours with 6 of the spirit, agitating occasionally, pack in a percolator, let it drain, and pour on the remaining spirit; when it ceases to drop, press, filter, and make up to 8.—*Dose.* 15 to 30 minims.

2. (Ph. L.) Squills, recently dried and sliced (or in coarse powder), 5 oz.; proof spirit, 1 quart; macerate for 7 days (14 days—Ph. D.; or by percolation—Ph. E.), press and filter. A stimulating expectorant and diuretic. —*Dose.* 10 to 30 drops; in chronic coughs, and other bronchial affections.

Tincture, Stomach'ic. Compound tincture of cardamoms. Compound tincture of gentian is also, occasionally, so called.

Tincture of Stramo"nium. *Syn.* TINCTURE OF THORN-APPLE; TINCTURA STRAMONII (B.P., Ph. D. & U. S.), L. *Prep.* 1. (B. P.) Stramonium seeds, bruised, 1; proof spirit, 8; macerate 48 hours with 6 of the spirit, agitating occasionally; pack in a percolator, let it drain, and pour on the remaining spirit. When it ceases to drop, press, filter, and add spirit to make 8.—*Dose.* 10 to 20 minims.

2. (Ph. D.) Stramonium or thorn-apple seeds (bruised), 5 oz.; proof spirit, 1 quart; macerate for 14 days (or by displacement— Ph. U. S.), then press, and filter. Anodyne.— *Dose.* 10 to 20 drops; in neuralgia, rheumatism, &c. Said to be superior to laudanum.

Tincture of Sum'bul. *Syn.* TINCTURA SUMBULI, B. P. *Prep.* 1. (B. P.) Sumbul, bruised fine, 1; proof spirit, 8; digest 7 days and filter.—*Dose.* 15 to 30 minims.

2. From sumbul, bruised, 5 oz.; proof spirit, 1 quart; macerate for a week, and strain, with expression. Stimulant and tonic. —*Dose.* 10 to 30 or 40 drops.

Tincture of Thorn-apple. Tincture of stramonium.

Tincture of Tobac'co. *Syn.* TINCTURA NICOTIANÆ, TINCTURA TABACI, L. *Prep.* From pure manufactured tobacco, 1¼ oz.; proof spirit, 1 pint; macerate for 7 days. Compound spirit of juniper is often used instead of proof spirit. Sedative and narcotic.—*Dose.* 10 to 30 drops. A tincture is also made from the fresh leaves. See VEGETABLE JUICES and TINCTURES (Ethereal).

Tincture of Tol'u. *Syn.* TINCTURA TOLUTANUS (B. P.), TINCTURA TOLUTANA (Ph. L. & D.), T. BALSAMI TOLUTANI, T. TOLUIFERÆ BALSAMI, L. *Prep.* 1. (B. P.) Balsam of tolu, 1; rectified spirit, 8; dissolve, filter, and make up to 8.—*Dose.* 15 to 30 minims, mixed with mucilage or syrup.

2. (Ph. L.) Balsam of Tolu, 2 oz. (3½ oz.—Ph. E.); rectified spirit, 1 quart (1 pint—Ph. D.); dissolve (by the aid of a gentle heat—Ph. E. & D.), and filter.

Obs. This tincture is reputed pectoral and expectorant; but it is chiefly used as an adjuvant in mixtures, on account of its flavour.—*Dose.* 10 to 60 drops.

Tincture, Tooth. *Prep.* 1. (Greenhough's.) From bitter almonds, 2 oz.; Brazil wood, cinnamon, and orris root, of each, ½ oz.; alum, cochineal, and salt of sorrel, of each, 1 dr.; spirit of scurvy grass, 2 fl. oz.; proof spirit, 1½ pint; macerate a week.

2. (Hudson's.) From the tinctures of myrrh and cinchona, and cinnamon water, equal parts, with a little arquebusade and gum arabic.

3. (Ruspini's.) From orris root, 8 oz.; cloves, 1 oz.; ambergris, 20 grs.; rectified spirit, 1 quart; digested for 14 days. The above are used as cosmetics for the teeth and gums. The last has long been a popular dentifrice.

Tincture, Toothache. Odontalgic tincture. See also DROPS, ESSENCE, &c.

Tincture of Vale'rian. *Syn.* TINCTURA VALERIANÆ (B. P., Ph. L. E. & D.), L. *Prep.* 1. (B.P.) Valerian bruised, 1; proof spirit, 8; macerate the valerian 48 hours with 6 of the spirit, agitating occasionally; pack in a percolator, let it drain, pour on the remainder of the spirit; when it ceases to drop, press and filter, washing the marc with spirit to make up 8.—*Dose.* 1 to 2 drs.

2. (Ph. L.) Valerian root, bruised, 5 oz.; proof spirit, 1 quart; macerate 7 days (14 days—Ph. D.; or by percolation—Ph. E.), press, and filter. Tonic and antispasmodic.—*Dose.* 1 to 3 fl. drs.; in hysteria, epilepsy, &c.

Tincture of Valerian (Compound). *Syn.* AMMONIATED TINCTURE OF VALERIAN, VOLATILE T. OF V.; TINCTURA VALERIANÆ COMPOSITA (Ph. L.), T. V. AMMONIATA (B. P., Ph. E.), L. *Prep.* 1. (B.P.) Valerian, bruised, 1; aromatic spirit of ammonia, 8; macerate the valerian 7 days, press, filter, and add spirit to make up 8.—*Dose.* ½ to 1 dr.

2. (Ph. L.) Valerian root, bruised, 5 oz.; aromatic spirit of ammonia (simple—Ph. E.), 1 quart; macerate for 7 days (or by percolation—Ph. E.), then press, and filter. Stimulant, tonic, and antispasmodic.—*Dose* and *use*, same as those of the simple tincture, than which it is thought to be more powerful. The tincture of the shops is generally made with only 1 lb. of the root to the gallon.

Tincture of Vera'trum. *Syn.* TINCTURE OF WHITE HELLEBORE; TINCTURA VERATRI VIRIDIS; TINCTURA HELLEBORI ALBI, T. VERATRI (Ph. E.), L. *Prep.* 1. (B. P.) Green hellebore root, in coarse powder, 4; rectified spirit, 20; macerate the powder with 15 of the spirit 48 hours, agitating occasionally, pack it in a percolator, let it drain, pour on the remainder of the spirit, when it ceases to drop, press, filter, wash the marc with spirit to make up 20.—*Dose.* 5 to 20 minims.

2. (Ph. E.) White hellebore, 4 oz.; proof spirit, 1 pint; digest or percolate.—*Dose.* 10 drops, 2 or 3 times a day, gradually increased; in gout, rheumatism, &c., as a substitute for colchicum; also, externally.

Tincture of Virginian Snake Root. Tincture of serpentary.

Tincture of Vittie-vayr. *Syn.* TINCTURA VETIVERIÆ, L. *Prep.* From vittie-vayr (roots of Andropogon muricatis), 2½ oz.; proof spirit, 1 pint; macerate a week. Stimulant, tonic, and sudorific.—*Dose.* 15 to 30 drops.

Tincture, Warburg's Fever. *Syn.* TINCTURA FEBRIFUGA WARBURGII. According to M. Fuchs, this tincture may be exactly imitated as follows:—Take of hepatic aloes and zedoary root, of each, 1 dr.; saffron, 3 grs.; angelica root and camphor, of each, 2 grs.; spirit (·897, or about 18 o. p.), 3 oz.; make a tincture (which should be 25 drs.), and dissolve in it (by the aid of a gentle heat), 30 grs. of sulphate of quinine. It is put up in 5-dr. bottles, each of which contains a dose, and is sold at about 5*s.* English. If the spirit be weaker than 18 or 20 o. p., some of the sulphate remains undissolved.

TINCTURES (Concentrated). *Syn.* TINCTURÆ CONCENTRATÆ HAENLI, L. *Prep.* (Ph. Baden.) Digest 8 parts of the vegetable powder in 16 of spirit of the sp. gr. ·857 (45 o. p.), for 4 days, at 72° Fahr., with occasional agitation, then press, and filter; to the marc or residuum add as much spirit as it has absorbed, and again press, and filter; the weight of the mixed liquors should be 16 parts. In this way are prepared concentrated tinctures of aconite leaves; arnica and chamomile flowers; belladonna, digitalis, hemlock, henbane, peppermint, and savine leaves; ipecacuanha and valerian roots, &c.

TINCTURES (Cu'linary). See ESSENCES, SPIRITS, &c.

TINCTURES (Ethe''real). *Syn.* TINCTURÆ ÆTHEREÆ, L. *Prep.* (P. Cod.) From the vegetable substance, 1 oz.; sulphuric ether, 4 oz. (or 6 fl. oz.); by maceration, for 4 days, in a well-closed vessel; or, preferably, by percolation in a cylindrical glass vessel furnished with a stopper, and terminating at the lower end in a funnel, obstructed with a little cotton. The powder being introduced over the cotton, pour on enough ether to moisten it, put in the stopper, fix the tube into the neck of a bottle, and leave it for 48 hours; then add, gradually, the remaining portion of the ether, and, lastly, enough water to displace the ether absorbed. In this manner are prepared the ethereal tinctures of aconite leaves, arnica flowers, belladonna, hemlock, foxglove, tobacco, pellitory, solanum, valerian, stramonium, &c., of the Paris Codex.

The ethereal tinctures of amber, ambergris, assafœtida, cantharides (acetic ether), castor, musk, tolu, &c., are prepared by maceration only.

TINCTURES (Odorif'erous). These are prepared from odoriferous substances by the usual processes of digestion or percolation. See Spirits.

TINCTURES from Recent Vegetables. See Vegetable Juices.

TIN'DER (German). See Amadou.

TISANE. [Fr.] *Syn.* Ptisan; Ptisana, L. This form of medicine is much used in France. Tisanes may be readily prepared by slightly medicating barley, rice, or tamarind water, lemonade, &c. See Decoction, Infusion, Julep, Ptisan, &c., and below.

Tisane Antiscorbutique. An infusion of buckbean and the fresh roots of horseradish.

Tisane Antivenerienne. Various compound decoctions of sarsaparilla are known by this name.

Tisane Commune. A decoction of pearl-barley and couch-grass, flavoured with liquorice root.

Tisane Pectorale. An infusion of the roots of liquorice and marsh-mallow, Canadian maiden-hair, and the flowers of the red poppy and coltsfoot, in a decoction of rice.

Tisane Royale. From senna, fresh chervil, and sulphate of soda, of each, 4 drs.; aniseed and cinnamon, of each, 1 dr.; 1 lemon, sliced; cold water, 1¾ pint; macerate for 24 hours, stirring occasionally, then press and filter. Aperient.—*Dose.* A wine-glassful, or more, repeated every half-hour, until it operates.

TIS'SUE (Blis'tering). See Vesicants.

TITA'NIUM. A rare metal, discovered by Klaproth in 1794, and examined by Wollaston in 1822. It is occasionally found at the bottom of the smelting furnaces of iron works, in combination with nitrogen and cyanogen, under the form of minute crystals, having a coppery lustre.

TOAST (Essence of). This is liquid burnt sugar or spirit colouring. *Used* to make extemporaneous toast-and-water (3 or 4 drops to the glass), and to flavour soups, gravies, &c.

TOBAC'CO. *Syn.* Tabacum (Ph. L. E. & D.), L.; Tabac, Fr. The prepared leaf of *Nicotiana Tabacum* (Linn.), or other species of the same genus. The name was given to this herb by the Spaniards, because it was first seen by them at Tabasco, or Tabaco, a province of Yucatan, in Mexico.

The tobacco of commerce is chiefly obtained from Virginia, and other parts of the United States, and recently from Japan and California, but the finest varieties are imported from Havannah and from the East. The plants are gathered when mature, during hot dry weather, and are hung up in pairs, in sheds, to dry. When sufficiently dry, the leaves are separated from the stems, bound up in bundles, and these are formed into bales, or packed in hogsheads, for exportation.

Prep. To impart to the dried leaves the characteristic odour and flavour of tobacco, and to render them agreeable to smokers and snuffers, it is necessary that they should undergo a certain preparation, or kind of fermentation. If a fresh green leaf of tobacco be crushed between the fingers, it emits merely the herbaceous smell common to most plants; but if it be triturated in a mortar along with a very small quantity of quicklime or caustic alkali, it will immediately exhale the peculiar odour of manufactured tobacco. This arises from the active and volatile ingredients being liberated from their previous combination, by the ammonia developed by fermentation, or the action of a stronger base. Tobacco contains a considerable quantity of chloride of ammonium, and this substance, as is well known, when placed in contact with lime or potassa, immediately evolves free ammonia. If we reverse the case, and saturate the excess of alkali in prepared tobacco by the addition of any mild acid, its characteristic odour entirely disappears. In the preparation of tobacco previously to its manufacture for sale, these changes are effected by a species of fermentation. Pure water, without any addition, is quite sufficient to promote and maintain the perfect fermentation of tobacco. The leaves soon become hot and evolve ammonia; during this time the heaps require to be occasionally opened up and turned over, lest they become too hot, take fire, or run into the putrefactive fermentation. The extent to which the process is allowed to proceed varies, for different kinds of snuff or tobacco, from one to three months.

Qual., &c. Tobacco is a powerful narcotic, sedative, and emetic; and is also cathartic and diuretic; but the last in a weaker degree than either squills or foxglove. Its action is violently depressing and relaxing, producing fainting, and even death, in comparatively small quantities. Toxicologists rank it among the more active narcotico-acrid poisons; and physicians, when they wish to produce sudden physical prostration, in accidents or spasmodic diseases, order an enema of the infusion or smoke of tobacco. Its deleterious properties depend on the presence of narcotine, one of the most frightful vegetable poisons known, of which ordinary Virginia tobacco contains from 6 to 7%. Yet of such a vegetable substance, so rich in such a deadly poison, upwards of 30,000,000 lbs. are said to be annually consumed in the British islands alone, by smokers and snuffers.

Tobacco, British. *Syn.* Herb tobacco; Tabacum Anglicum, Species sternutoriæ, L. *Prep.* Take of thyme, marjoram, and hyssop, of each, 2 oz.; betony and eyebright, 3 oz.; rosemary and lavender, of each, 4 oz.; coltsfoot, 1 lb.; mix, press them together, and cut the mass in imitation of manufactured foreign tobacco. Some asthmatic subjects add 5 or 6 oz. of stramonium or thorn-apple leaves; and others add ½ lb. of genuine tobacco.

Tobacco, Indian. See Lobelia.

TOD'DY. Obtained from various species of palms, by cutting off the end of the flowering bud, and collecting the sap. *Used*, fresh, as a cooling beverage; and, after fermentation, as an intoxicating one. Sweetened grog is so called in Cornwall, and in some other parts of England.

TOF'FY. *Syn.* Everton toffy. A sweetmeat prepared by heating brown sugar, in a saucepan or skillet, with about one half its weight of fresh butter, for 15 to 20 minutes, or until a 'little of it dropped into cold water forms a lump that breaks crisply;' it is then poured into a little buttered tin mould.

TOM'BAC. A species of brass with excess of zinc. Red tombac is red brass or Dutch gold; white tombac, an alloy of copper with arsenic.

TON'ICS. Medicines that increase the tone of the muscular fibre, and impart vigour to the system.

TON'QUIN REMEDY. *Syn.* Pulvis Tunchinensis, P. alexipharmicus Sinensis, L. *Prep.* From valerian, 20 grs.; musk, 16 grs.; camphor, 6 grs.; mix. Antispasmodic and alexiterial, in doses of 6 to 12 grs., in hooping-cough, &c.; 1 dr., in hydrophobia, exanthemata, and mania.

TOOTH'ACHE. *Syn.* Odontalgia, L. This annoying affection frequently arises from sympathy with a disordered stomach. In such cases a saline purgative should be administered, and an emetic, if required. When cold is the cause, an excellent remedy is a hot embrocation of poppy-heads, followed by the use of flannel and diaphoretics. When it arises from a hollow or decayed tooth, the best application is a piece of lint moistened with creasote, or a strong spirituous solution of creasote, and closely rammed into the cavity of the tooth. Laudanum, the essential oils of cloves, caraway, and cajeput, and essence or tincture of pellitory of Spain, are also used in the same way. To prevent the recurrence of the latter kind of toothache, the cavity should be filled with an amalgam of gold, or with mineral marmoratum, or some other good cement. In many cases, chewing a piece of good ginger, or, still better, a small piece of pellitory, will afford relief in a few minutes. The celebrated John Wesley recommended a 'few whiffs' at a pipe containing a little caraway seed mixed with the tobacco. A slight 'shock' from a voltaic battery will often instantly remove the toothache after all other means have failed. See Drops, Essence, Tincture, &c.

TOOTH CEMENTS. *Prep.* 1. Amalgam of gold, applied warm. Silver, and even tin, are also used in the same way.

2. A piece of purified white gutta percha, softened in hot water, and applied at once. Efficient and durable.

3. Zinc filings, 1 part; quicksilver, 2 parts; mixed, and applied at once. Not very durable.

4. (Bernotte's.) From powdered mastic mixed with about half its weight of ether, and, afterwards, with enough finely powdered burnt alum to form a stiff paste. 'Taveare's Cement' is similar.

5. (Evans.) Pure tin, 2 parts; cadmium and bees' wax, of each, 1 part; melt them together, cast the compound metal into a small ingot, and reduce it to filings. For use, form these into a liquid amalgam with quicksilver, q. s.; squeeze out the excess of quicksilver through a piece of chamois leather, and at once apply it to the tooth. (See No. 9.) Recommended as very durable and unobjectionable.

6. ('Marmoratum.') From anhydrous phosphoric acid, 12 grs.; pure caustic lime, 13 grs.; both finely pulverised, mixed rapidly in a mortar, and applied, in the dry state, as rapidly as possible, as it soon becomes moist; the mixed powder, after being well pressed in, is smoothed off with the finger moistened with a drop of water. This is white and durable, and soon acquires great hardness. In its composition it resembles the natural earthy matter of the teeth.

7. ('Mineral marmoratum.') The same as 'mineral succedaneum' (No. 9), with the addition of a little powdered glass or quartz. A common sort is made of levigated glass mixed with amalgam of tin.

8. ('Mineral metallic cement.') Add finely levigated steel filings to some mineral succedaneum. Dark-coloured inferior to 'mineral marmoratum.'

9. ('Mineral succedaneum.') This is merely amalgam of gold first above noticed. The common method of proceeding is to heat pure gold in a bright iron ladle, and to add enough pure mercury to render it of a doughy consistence at the heat of hot water; when cold, the excess of mercury, if any, must be removed by pressure in a piece of chamois leather. For use, a little must be kneaded, as hot as possible, in the hand, and at once wedged into the cavity of the tooth.

10. (Ostermaier's.) Same as No. 6.

11. ('Poudre metallique.') The article sold in Paris under this name is said to be a triple amalgam of mercury, silver, and ammonium, with the latter in excess; part of the ammonium escapes as ammoniacal gas, whilst the remainder of the ammonium, silver, and mercury, remains as a firm alloy in the cavity of the tooth. (Redwood.)

12. ('Silica.') From levigated porcelain, plaster of Paris, and iron filings, equal parts, made into a paste with the thickest quick-drying copal varnish.

13. ('Vienna cement.') From powdered asbestos, made into a paste with mastic varnish.

14. (Wirth's.) From levigated quartz, made into a paste with very thick mastic varnish.

Obs. It is absolutely necessary for success that the teeth be well cleaned out, and wiped dry, before applying any of the above stoppings or cements.

TO'PAZ. See Gems.

TOR'MENTIL. *Syn.* Tormentillæ radix; Tormentilla (Ph. L. & E.), L. The root or rhizome of *Potentilla Tormentilla.* It is astringent and febrifuge, without being stimulant.—*Dose.* 20 to 60 grs.; in agues, diarrhœa, &c.; also, formerly, in syphilis.

TOUCH-NEEDLES. See Assaying.

TOUCH-WOOD. See Amadou.

TOUS-LES-MOIS. The fecula of the roots of *Canna edulis* (Ph. D.); intended as a substitute for arrow-root. To the naked eye, it closely resembles the finest quality of potato-starch, but under the microscope its granules are found to be oblong, oval, with a concentric structure, and larger than those of the potato tuber.

TOXICOL'OGY. See Poison.

TRAG'ACANTH. See Gum.

TRANSPA''RENCIES. Water-colour pictures on paper, linen, or calico, if executed in non-opaque or glazing colours, may be converted into transparencies by simply brushing over their backs with Canada balsam, thinned down, when necessary, with a little oil of turpentine. For coarse work, boiled oil may be employed.

TRAUMAT'IC BALSAM. Compound tincture of benzoin is known by this name. See Tincture.

TRAUMAT'ICINE. This article, as manufactured by the Gutta Percha Company, is simply a solution of white and dry unmanufactured gutta percha in bisulphuret of carbon. A small portion dropped on a wound, or raw surface, almost instantly forms a pliable, waterproof, and air-tight defensive covering to the part. The only objection to the preparation is the fetid odour of the menstruum, which, however, is lost in a few seconds, or may be obviated by employing chloroform as the solvent.

TREA'CLE. *Syn.* Molasses; Theriaca (B. P.), Theriaca, Sacchari fæx (Ph. L. & E.), L. The viscid, brown, uncrystallisable syrup which drains from moist sugar during its formation (molasses), and from the sugar-refining moulds (sugar-house molasses). The last, according to Dr. Ure, has generally the sp. gr. 1·4, and contains about 75% of solid matter.

Treacle is more laxative than sugar, and always contains more or less free acid. It is used as the vehiculum in some of the pill-masses of the Ph. L. See Sugar.

Treacle, German. *Syn.* Theriaca Germaniæ, L. An evaporated infusion or decoction of juniper berries. It is sweet-tasted, aromatic, and diuretic.

Treacle, Venice. *Syn.* London treacle; Theriaca, T. Andrōchi, L. The theriaca of the Ph. L. 1746 consists of 61 ingredients, and contains 1 gr. of opium in 75 grs.; that of the Paris Codex consists of 72 ingredients, and contains 1 gr. of opium in 72 grs.; that of the Ph. E. 1744 consists of 10 ingredients, and contains 1 gr. of opium in every 100 grs. It is prepared as follows:—Take of serpentary root, 6 oz.; valerian and contrayerva roots, of each, 4 oz.; aromatic powder, 3 oz.; guaiacum resin, castor, and nutmeg, of each, 2 oz.; saffron and opium (dissolved in a little wine), of each, 1 oz.; clarified honey, 75 oz.; reduce all the dry ingredients to fine powder, then mix them. The confections or electuaries of catechu and opium are the representatives of the above polypharmic compounds in the modern British Pharmacopœias.

TRI-, tris-. See Nomenclature.

TRIP'OLI. *Syn.* Rotten stone; Alana, Terra cariosa, L. A mineral employed as a polishing powder, originally imported from Tripoli, in Barbary. It consists almost entirely of silica, and is composed of the skeletons of minute infusoria, the precise character of which is readily distinguishable under the microscope.

TRIS'MUS. See Tetanus.

TRITURA'TION. *Syn.* Tritura, Trituratio, L. The act of rubbing a solid body to powder. See Pulverization.

TRO'CHES. See Lozenges.

TRO'NA. A native carbonate of soda, found on the banks of the soda-lakes of Sokena, in Africa.

TROPH'AZOME. A concentrated infusion of minced lean meat mixed with the fluid obtained from the residuum after being heated for 20 minutes in a water bath, and flavoured with salt and spices, the whole being, lastly, simmered for a few minutes. Excellent for convalescents.

TROUT. The *Salmo furio* of Linnæus, a highly esteemed fish, found in most of the rivers and lakes of this country. Other members of the genus *salmo* are also so called; as, *S. eriox*, the bull or gray trout; *S. ferox*, the great gray or lake trout; *S. trutta*, the salmon trout, &c. All of these varieties are in the finest condition from the end of May to late in September.

TUNG'STEN. W. *Syn.* Tungstenum, Wolframium, L. A heavy, gray, brittle metal, discovered by Delhuyart.

TUNGSTATE OF SODIUM. Na_2WO_4. This salt is used for rendering linen, cotton, and other fabrics uninflammable; also as a substitute for stannate of sodium as a mordant in dyeing. It may be prepared by adding 9 parts of finely powdered tungsten to 8 parts of fused carbonate of sodium, and continuing the heat for some time; on boiling the cooled and pulverised mass with water, evaporating the filtrate to dryness, and treating the residue with luke-warm water, the salt dissolves out. Muslin steeped in a 20% solution of this salt is perfectly uninflammable when dry, and the saline film left upon its surface is so smooth that the muslin may be ironed without difficulty. See Richardson and Watt's 'Chemical Technology,' i,[4]48.

TUR'BOT. The *Rhombus maximus* (Cuvier), said to be the best and, excepting the halibut, the largest of our flat fishes. Dutch turbots are the most esteemed.

TUR'KEY. See POULTRY.

TUR'MERIC. *Syn.* CURCUMA (Ph. L. & D.), L. The rhizome of *Curcuma longa.* The best is imported from Ceylon. It is stimulant and carminative, but is chiefly used in dyeing yellow, and as an ingredient in curry-powder; also as a test for alkalies. It gives a fugitive golden yellow with wold, and an orange tinge to scarlet. It dyes wool and silk, mordanted with common salt, or sal ammoniac, a fugitive yellow.—*Dose.* 10 to 30 grs. See CURCUMINE.

TURNBULL'S BLUE. *Syn.* FERRICYANIDE OF IRON; FERRI FERRIDCYANIDUM, L. *Prep.* Precipitate a solution of protosulphate of iron with another of red prussiate of potash (ferricyanide of potassium).

Obs. This is a variety of Prussian blue, remarkable for its beautiful colour, and may be distinguished from the ordinary Prussian blue of commerce by its action on the yellow prussiate of potash. When boiled in a solution of the latter, it is decomposed, a portion is dissolved, and a gray residue remains.

TURNER'S YELLOW. See YELLOW PIGMENTS.

TURN'SOLE. See LITMUS.

TUR'PENTINE. *Syn.* TURPENTIN; TEREBINTHINA (Ph. L. E. D.), L. An oleo-resin flowing from the trunk, the bark being removed, of *Pinus palustris* (pitch or swamp pine) and *Pinus Tæda* (loblolly or old field pine)." (Ph. L.) "From *Pinus sylvestris* (the Scotch fir)." (Ph. D.) "From various species of *Pinus* and of *Abies.*" (Ph. E.) It is viscid, of the consistence of honey, and transparent; by distillation it is resolved into oil of turpentine, which passes over into the receiver; and into resin, which remains in the still.

Turpentine, Bordeaux. *Syn.* FRENCH TURPENTINE. From the *Pinus maritima,* or cluster pine. Solidifies with magnesia. (Lindley.)

Turpentine, Chian. *Syn.* CHIO TURPENTINE, CYPRUS T., SCIO T.; TEREBINTHINA CHIA (Ph. L. & E.), L. "An oleo-resin flowing from the incised trunk of *Pistachia terebinthus*" (Linn.). (Ph. L.) It is pale, aromatic, fragrant, and has a warm taste, devoid of acrimony or bitterness. It is much adulterated. A factitious article (terebinthina Chia factitia), made as follows, is also very generally sold for it:—Black resin, 7 lbs.; melt, remove the heat, and stir in of balsam of Canada, 7 lbs.; oils of fennel and juniper, of each, 1 fl. dr.

Turpentine, Venice. *Syn.* TEREBINTHINA VENETA (Ph. E.), L. Liquid resinous exudation from the *Abies Larix,* or larch tree. It is sweeter and less resinous-tasted than common turpentine, but is now scarcely ever met with in trade. That of the shops is wholly a factitious article, made as follows:—Black resin, 48 lbs.; melt, remove the heat, and add of oil of turpentine, 2 galls.

TUR'PETH MINERAL. Basic sulphate of mercury.

TUR'TLE. *Syn.* GREEN TURTLE. The *Testuda midas* (Linn.), a chelonian reptile, highly esteemed for its flesh, eggs, and fat.

TUSSILA'GO. See COLTSFOOT.

TU'TENAG. A name sometimes applied to German silver; at others, to pale brass and bell metal. "In India zinc sometimes goes under this name." (Brande.)

TUT'TY. *Syn.* TUTIA, TUTHIA, IMPURE OXIDE OF ZINC. The sublimate that collects in the chimneys of the furnaces in which the ores of zinc are smelting. Drying; astringent. *Used* in eye-waters and ointments.

TYPE METAL. An alloy formed of antimony, 1 part; lead, 3 parts; melted together. Small types are usually made of a harder composition than large ones. A good stereotype metal is said to be made of lead, 9 parts; antimony, 2 parts; bismuth, 1 part. This alloy expands as it cools, and, consequently, brings out a fine impression.

UL'MIN, ULMIC ACID. By boiling sugar in dilute sulphuric acid for a long time, a brownish-black substance is produced. Boullay and Malaguti state that this is a mixture of two distinct bodies—ulmin (sacchulmin—Liebig) and ulmic acid (sacchulmic acid—Liebig). The first is insoluble in solutions of the alkalies; the latter dissolves in them freely. A number of black uncrystallisable substances, produced by the action of powerful chemical agents upon vegetable matter, have been confounded under these names.

ULTRAMARINE'. *Syn.* LAPIS-LAZULI BLUE, ULTRAMARINE B.; CÆRULEUM ULTRAMONTANUM, L. This beautiful pigment is obtained from the blue mineral azure stone, lazulite, or lapis lazuli, the finest specimens of which are brought from China, Persia, and Great Bucharia.

Prep. Pure lapis lazuli (reduced to fragments about the size of a pea, and the colourless pieces rejected), 1 lb., is heated to redness, quenched in water, and ground to an impalpable powder; to this is added, of yellow resin, 6 oz.; turpentine, bees' wax, and linseed oil, of each, 2 oz.; previously melted together; the whole is next made into a mass, which is kneaded in successive portions of warm water, as long as it colours it blue; from these it is deposited on repose, and is then collected, well washed with clean water, dried, and sorted according to its qualities. The first water, which is usually dirty, is thrown away; the second gives a blue of the first quality; and the third, and following ones, yield sumples of less value. The process is founded on the property which the colouring matter of azure-stone has of adhering less firmly to the resinous cement than the foreign matter with which it is associated. When azure-stone has its colour altered by a moderate heat, it is reckoned bad or factitious.

Obs. Ultramarine is the most costly, but at the same time the most splendid and permanent, of our blue pigments, and works well in oil.

Ultramarine Ashes. *Syn.* SAUNDER'S BLUE. Obtained from the resinous mass from making ultramarine, by melting it with fresh oil, and kneading it in water containing a little potash or soda; or, by burning away the wax and oil of the mass and well grinding and washing the residue with water. Very permanent, but much less brilliant than ultramarine.

Ultramarine, Artificial. *Syn.* AZURE BLUE, MEISSNER ULTRAMARINE, PARIS B., VIENNA B.; CÆRULEUM ULTRAMONTANUM FACTITIUM, L. From the researches of Clement, Desormes, and Robiquet, it has been inferred that the colour of ultramarine depends on the presence of sulphuret of sodium in a peculiar state of combination with the silicates of soda and alumina; but, according to Elsner and Tirnmon, a minute quantity of sulphuret of iron is also an essential ingredient. It is by heating mixtures of this kind that the artificial ultramarine of commerce is prepared. The finer specimens, thus obtained, are quite equal in durability and beauty of colour to those prepared from lazulite, while they are very much less expensive.

Prep. 1. Kaolin, 37 parts; sulphate of soda, 15; carbonate of soda, 22; sulphur, 18; charcoal, 8; intimately mixed and heated from 24 to 30 hours, in large crucibles; the product is then heated again in cast-iron boxes, at a moderate temperature, till the required tint is obtained; it is, finally, pulverised, washed, and dried.

2. (Gmelin.) Sulphur, 2 parts; dry carbonate of soda, 1 part; mix well; gradually heat them in a covered crucible to redness, or till the mixture fuses, then sprinkle in, by degrees, another mixture of silicate of soda and 'aluminate of soda' (containing 72 parts of silica and 70 parts of alumina), and continue the heat for an hour. The product contains a little free sulphur, which may be separated by water.

3. (Robiquet.) By exposing to a low red heat, in a covered crucible, as long as fumes are given off, a mixture of pure kaolin, 2 parts; anhydrous carbonate of soda and sulphur, of each, 3 parts. Some manufacturers who adopt this process use 1-3rd less carbonate of soda.

4. (Tirnmon.) Take of crystallised carbonate of soda, 1075 grs.; apply a gentle heat, and, when fused in its water of crystallisation, shake in of finely pulverised orpiment, 5 grs., and, when partly decomposed, add as much gelatinous hydrate of alumina as contains 7 grs. of anhydrous alumina; finely sifted clay, 100 grs., and flowers of sulphur, 221 grs., are next to be added, and the whole placed in a covered crucible, and at first gently heated, to drive off the water; but as soon as this is effected, raised to redness, the heat being so regulated that the ingredients only 'sinter' together, without actually fusing; the mass is then to be cooled, finely pulverised, suspended in river water, and brought upon a filter; the product has now a very beautiful delicate green or bluish colour, but on being heated in a covered dish, and stirred about from time to time, until the temperature reaches that of dull redness, at which it must be kept for 1 or 2 hours, it changes to a rich blue. If the heat of the first calcination has been properly regulated, the whole of the mass taken from the crucible will have uniform colour; but if too little heat has been used, and the ingredients have not been properly mixed, there will be colourless parts, which should be rejected; if too much heat has been used, or the mass allowed to fuse, brown parts will appear, especially if the crucible is of a bad kind, or easily destroyed; these must also be rejected. ('Compt. Rend.,' 1842.)

Ultramarine, Cobal'tic. *Syn.* CHINESE BLUE, COBALT B., LOUISA B., HÖFFNER'S B., THÉNARD'S B. A very rich blue pigment, with many synonymes, prepared by slowly drying and heating the dull redness a mixture of freshly precipitated alumina (freed from water as much as possible), 8 to 10 parts; arseniate or phosphate of cobalt, 1 part. By daylight it is of a pure blue, but by artificial light the colour turns on the violet. For other formulæ see BLUE PIGMENTS.

U'PAS. The Javan name for several deadly poisons. 'Bohun upas' is a gum-resin obtained from the bark of the *Antiaris toxicaria.* (See ANTIARINE.) The 'upas tieuté' is obtained from the *Strychnos Tieuté,* and owes its fatal power to strychnine. They are both used to poison arrows and other deadly weapons.

URA''NIUM. U. A rare metal, discovered by Klaproth, in 1789. It occurs in the pitchblende of Saxony, and the uranite of Cornwall.

Uses. Its ores and oxides are occasionally used to colour glass and enamels.

U'RATES. Salts of uric acid.

U'REA. COH_4N_2. *Syn.* CYANATE OF AMMONIUM (Anomalous). A crystalline, colourless, transparent substance, discovered by Fourcroy and Vauquelin in Urine, and by Wöhler as the first organic compound artificially produced.

Prep. (Thénard.) Fresh urine, gently evaporated to the consistence of a syrup, is treated with its own volume of nitric acid of sp. gr. 1·19; the mixture is shaken and immersed in an ice bath, to solidify the crystals of nitrate of urea; these are washed with ice-cold water, drained, and pressed between sheets of blotting paper; they are next dissolved in water, and the solution is decomposed and precipitated with carbonate of potassium (or carbonate of barium); the whole is then gently evaporated nearly to dryness, and the residuum is exhausted with pure alcohol, which dissolves the urea, which crystallises out as the solution cools.

Urea, Ni'trate of. *Syn.* UREÆ NITRAS, L. *Prep.* From urine, as described above; or it may be prepared by saturating artificial urea with nitric acid. Diuretic.—*Dose.* 2 to 5 grs., twice or thrice daily; in dropsy.

U'RIC ACID. $C_5H_4N_4O_3$. *Syn.* LITHIC ACID; ACIDUM LITHICUM, A. URICUM, L. A substance discovered by Scheele, and peculiar to the urine of certain animals, and the excrement of serpents and several birds. The fæces of the boa constrictor consist of little else than urate of ammonium. It constitutes one of the commonest varieties of urinary calculi, and of the red gravel or sand which is voided in certain morbid states of the urine. Guano derives its principal value as a manure from the presence of urate of ammonium. The gouty concretions of the joints, popularly known as chalk-stones, consist chiefly of urate of sodium.

Prep. Dissolve the chalk-like excrement of serpents, reduced to fine powder, in a solution of caustic potassa, by boiling, then add hydrochloric acid in excess, again boil for 15 minutes, and well wash the precipitate with water.

Prop., &c. Brilliant, very minute, white and silky scales, which are tasteless, inodorous, slightly soluble in boiling water, and dissolve in strong sulphuric acid, but are again precipitated by water. It forms salts with the bases called urates, all of which are very sparingly soluble. The characteristic reaction of uric acid is, that, when moistened with nitric acid and heated, it dissolves, and by evaporation yields a red compound, which, upon the addition of a drop or two of solution of ammonia, assumes a magnificent crimson colour, being converted into murexide.

U'RINE. The density of the urine varies from 1·005 to 1·030; the average, in health, being 1·020, when it contains about 380 grs. of solid matter in the pint. According to Berzelius, the proportion is about 6⅔ %, the rest being pure water. It exhibits a decidedly acid reaction, and is never alkaline, except during disease, or the use of large quantities of alkaline salts of the vegetable acids. The average quantity secreted during 24 hours may be taken at 1½ pint to 1¾ pint.

The presence of bile in urine, or other like fluids, may be detected as follows:—Put a small quantity of the suspected liquid into a test-tube, and add to it drop by drop, strong sulphuric acid, until it becomes warm, taking care not to raise the temperature above 122° Fahr.; then add from 2 to 5 drops of syrup (made with 5 parts of sugar to 4 of water), and shake the mixture. If the liquid contain bile, a violet coloration is observed. Acetic acid may be substituted for sugar.

The presence of sugar, and the quantity present, may be determined in the manner described under SUGAR (tests for). White merino, that has been wet with a solution of bichloride of tin, is also said to form a ready test for sugar in urine.

The quantity of urea present in urine is best determined by treating that liquid with a solution of pernitrate of mercury of known strength, alternately with a solution of baryta, as long as a white precipitate falls. As soon as the whole of the urea is thrown down, the precipitate assumes a yellow colour.

URINOM'ETER. An hydrometer adapted to determining the density of urine. That of Dr. Prout is the simplest and best.

URN POWDER. Crocus martis, or jeweller's rouge.

URTICAR'IA. See RASH.

US'QUEBAUGH. *Syn.* ESCUBAC. Literally, mad water, the Irish name of which, 'whiskey,' is a corruption. At the present time it is applied to a strong cordial spirit, much drunk in Ireland, and made in the greatest perfection at Drogheda.

Prep. 1. Brandy or proof spirit, 3 galls.; dates (without their kernels) and raisins, of each, bruised, ¼ lb.; juniper berries, bruised, 1 oz.; mace and cloves, of each, ¾ oz.; coriander and aniseed, of each, ½ oz.; cinnamon, ¼ oz.; macerate, with frequent agitation, for 14 days, then filter, and add of capillaire or simple syrup, 1 gall.

2. Pimento and caraways, of each, 3 oz.; mace, cloves, and nutmegs, of each, 2 oz.; aniseed, corianders, and angelica root, of each, 8 oz.; raisins, stoned and bruised, 14 lbs.; proof spirit, 9 galls.; digest as before, then press, filter, or clarify, and add of simple syrup, q. s. Should it turn milky, add a little strong spirit, or clarify it with alum, or filter through magnesia.

Obs. Usquebaugh is either coloured yellow with saffron (about ¼ oz. per gall.), or green with sap-green (about ¼ oz. per gall.); either being added to the other ingredients, before maceration in the spirit.

VACCINA'TION. See COW-POX.

VAC'CINE MATTER. *Syn.* LYMPHA VACCINIÆ, L. This is collected either upon the points of lancet-like pieces of ivory, or by opening the pustule, and applying a small glass ball and tube (like those called by the boys in London candle-pops, or fire-pops) to the orifice, expelling part of the air in the ball by bringing a lighted taper near it; then, withdrawing the taper, the matter is sucked into the ball, in which it may be sealed up hermetically or cemented, and thus kept for a length of time. It is, however, now generally preserved between two small pieces of glass, or in straight capillary glass tubes. It is said that cotton thread is a convenient and efficient vehicle. The matter may be liquefied with a little clean water before application. A degree of heat scarcely higher than that of the blood lessens its efficacy.

VAC'UUM. Empty space; a portion of

space void of matter. For experimental and manufacturing purposes, a sufficient vacuum is produced either by means of the air-pump, or by filling an enclosed space by steam, which is then condensed by the application of cold. Evaporation proceeds much more rapidly, and liquids boil at much lower temperatures in an exhausted receiver than when exposed to the air. Thus, under ordinary circumstances, in the air, ether boils at 96°, alcohol at 177°, and water at 212° Fahr.; but in vacuo water boils at about 88°, alcohol at 56°, and ether at —20° Fahr. In the best vacuum obtainable by a powerful air-pump, water placed over oil of vitriol, to absorb the aqueous vapour as it forms, will often enter into violent ebullition whilst ice is in the act of formation on its surface. The reduction of the boiling-point with reduced pressure is practically taken advantage of by the pharmaceutist in the preparation of extracts, by the sugar refiner in the evaporation of his syrups, by the distiller in the production of certain liqueurs, and by the chemist in a variety of processes of interest or utility. See EXTRACTS, EVAPORATION, REFRIGERATION, &c.

VALE'RIAN. *Syn.* VALERIANÆ RADIX (B. P.), VALERIANÆ RADIX, VALERIANA (Ph. L. E. & D.), L. "The root of the wild plant *Valeriana officinalis* (Linn.), or wild valerian." (Ph. L.) An excitant, antispasmodic, tonic, and emmenagogue, not only acting on the secretions, but exercising a specific influence over the cerebro-spinal system, and in large quantities producing agitation, mental exaltation, and even intoxication.—*Dose.* 10 to 30 or 40 grs., thrice daily; in hysteria, epilepsy, headache (affecting only one side), morbid nervous sensibility, &c. Even the odour of it exerts a species of fascination over cats.

VALERIAN'IC ACID. $HC_5H_9O_2$. *Syn.* VALERIC ACID; ACIDUM VALERIANICUM, A. VALERICUM, L. *Prep.* 1. A mixture of potato oil or corn-spirit oil (hydrated oxide of amyl) with about 10 times its weight of quicklime and hydrate of potassa in equal proportions, placed in a glass flask, is kept heated to about 400° Fahr., for 10 or 12 hours, by means of a bath of oil or fusible metal; the nearly white solid residuum is mixed with water, an excess of sulphuric acid added to the mixture, and the whole subjected to distillation; the distillate is supersaturated with potassa, evaporated nearly to dryness, to dissipate any undecomposed potato oil, and then mixed with weak sulphuric acid in excess; a light oily liquid (terhydrated valerianic acid) separates, which, by cautious rectification, yields at first water containing a little acid, and afterwards pure monohydrated valerianic acid, which is perfectly identical with that prepared from valerian root.

2. (Ph. D.) See VALERIANATE OF SODIUM. This is the most economical process.

Prop., &c. A limpid oily liquid, smelling strongly of valerian root; it has an acid taste and reaction, and leaves a sensation of sweetness and a white spot on the tongue; is inflammable; boils at 347°; is freely soluble in alcohol and ether; dissolves in 30 parts of water, and forms salts called valerianates, most of which have a sweetish taste, are soluble, and uncrystallisable; sp. gr. ·937; placed in contact with water, it absorbs a portion of it, and is converted into the terhydrated acid, with increase of sp. gr., and reduction of the boiling-point.

VALE'RIC ACID. See VALERIANIC ACID.

VALO'NIA. The cup of a large species of acorn, imported from the Levant. *Used* in tanning leather.

VANAD'IC ACID. V_2O_5. *Syn.* VANADIC ANHYDRIDE, TEROXIDE OF V.; ACIDUM VANADICUM, L. *Prep.* (Johnston.) From the native vanadate of lead, by dissolving it in nitric acid, passing sulphuretted hydrogen through the solution, to throw down lead and arsenic, filtering, and evaporating the resulting blue liquid to dryness; the residuum is then dissolved in a solution of ammonia, and a piece of sal ammoniac, considerably larger than can be dissolved, introduced; as the latter dissolves, a pulverulent precipitate of vanadate of ammonium is formed, which must be washed, first in a solution of sal ammoniac, and then in alcohol of ·860; by exposing this salt, in an open platinum crucible, to a heat a little below redness, and keeping it constantly stirred, until it acquires a dark red colour, pure vanadic acid is obtained.

Prop., &c. Vanadic acid is orange-coloured, scarcely soluble in water, and forms, with the alkaline bases, soluble salts called vanadates; and with the other bases sparingly soluble salts. All of these have an orange or yellow colour. "Vanadate of ammonia mixed with solution of galls forms a black fluid, which is the best writing ink hitherto known. The quantity of the salt required for this purpose is very small; the writing is perfectly black, and not obliterated by alkalies, acids, chlorine, or other reagents." (Ure.)

VANA'DIUM. V. A rare metal discovered by Sefstom, in 1830, in some Swedish iron extracted from an iron mine near Jönköping. It has since been found in a lead ore from Scotland, and in the iron slag of Staffordshire.

VANIL'LA. *Syn.* VANILLE, Fr. The dried pods of various species of Vanilla, a genus of the natural order *Orchidaceæ*. It is chiefly used in the manufacture of chocolate and perfumery. As a *medicine*, it is much employed on the Continent as an aromatic stimulant and neurotic.—*Dose.* 6 to 12 grs.; in asthenic fevers, hysteria, hypochondriasis, impotency, &c.

Vanilla is reduced to powder (PULVIS VANILLÆ; POUDRE DE VANILLE) by slicing it, and triturating the fragments with twice or thrice their weight of well-dried lump sugar. For SUCRE DE VANILLE, 11 parts of sugar are employed.

VAN SWIETEN'S SOLUTION. Contains $\frac{1}{1000}$th part of its weight of corrosive sublimate; or ½ gr. per fl. oz.

VARICOSE VEINS. See VARIX.

VA'RIX. The permanent unequal dilation of a vein, or veins, which are then said to be 'varicose.' It is known by the presence of a soft tumour, which does not pulsate, and often assumes a serpentine figure. Varicose veins of the groin and scrotum generally form a collection of knots. The treatment consists of cold applications, and pressure from bandages. Some cases are relieved by ligature. When occurring in the legs, much standing or walking should be avoided, and the use of the elastic stockings made for the purpose will be proper.

VAR'NISH. *Syn.* VERNIS, Fr. Any liquid matter, which, when applied to the surface of a solid body, becomes dry, and forms a hard glossy coating, impervious to air and moisture.

Varnishes are commonly divided into two classes—FAT or OIL VARNISHES and SPIRIT VARNISHES. The fixed or volatile oils, or mixtures of them, are used as vehicles or solvents in the former, and concentrated alcohol in the latter.[1] The sp. gr. of alcohol for the purpose of making varnishes should not be more than ·8156 (= 67 o. p.), and it should be preferably chosen of even greater strength. A little camphor is often dissolved in it, to increase its solvent power. The oil of turpentine, which is the essential oil chiefly employed for varnishes, should be pure and colourless. Pale drying linseed oil is the fixed oil generally used; but poppy oil and nut oil are also occasionally employed. Among the substances which are dissolved in the above menstrua are —amber, animé, copal, elemi, lac, mastic, and sandarach, to impart body and lustre; benzoin, on account of its agreeable odour; annotta, gamboge, saffron, Socotrine aloes, and turmeric, to give a yellow colour; dragon's blood and red sandal wood, to give a red tinge; asphaltum, to give a black colour and body; and caoutchouc to impart toughness and elasticity.

In the preparation of spirit varnishes, care should be taken to prevent the evaporation of the alcohol as much as possible, and also to preserve the portion that evaporates. On the large scale, a common still may be advantageously employed; the head being furnished with a stuffing-box, to permit of the passage of a vertical rod, connected with a stirrer at one end and a working handle at the other. The gum and spirit being introduced, the head of the still closely fitted on and luted, and the connection made with a proper refrigerator, heat (preferably that of steam or a water bath) should be applied, and the spirit brought to a gentle boil, after which it should be partially withdrawn, and agitation continued until the gum is dissolved. The spirit which has distilled over should be then added to the varnish, and, after thorough admixture, the whole should be run off, as rapidly as possible, through a silk-gauze sieve, into stone jars, which should be immediately corked down, and set aside to clarify. On the small scale, spirit varnishes are best made by maceration in closed bottles or tin cans, either in the cold or by the heat of a water bath. In order to prevent the agglutination of the resin, it is often advantageously mixed with clean siliceous sand or pounded glass, by which the surface is much increased, and the solvent power of the menstruum greatly promoted.

To ensure the excellence of oil varnishes, one of the most important points is the use of good drying oil. Linseed oil for this purpose should be very pale, perfectly limpid or transparent, scarcely odorous, and mellow and sweet to the taste.—100 gall. of such an oil is put into an iron or copper boiler, capable of holding fully 150 galls., gradually heated to a gentle simmer, and kept near that point for about 2 hours, to expel moisture; the scum is then carefully removed, and 14 lbs. of finely pulverised scale litharge, 12 lbs. of red lead, and 8 lbs. of powdered umber (all carefully dried and free from moisture), are gradually sprinkled in; the whole is then kept well stirred, to prevent the driers sinking to the bottom, and the boiling is continued at a gentle heat for about 3 hours longer; the fire is next withdrawn, and, after 30 to 40 hours' repose, the scum is carefully removed, and the clear supernatant oil decanted from the 'bottoms.'—The product forms the best boiled or drying-oil of the varnish-maker.—Another method is to heat a hogshead of the oil gradually for 2 hours, then to gently simmer it for about 3 hours longer, and, after removing the scum, to add, gradually, 1 lb. of the best calcined magnesia, observing to mix it up well with the oil, and, afterwards, to continue the boiling pretty briskly for at least an hour, with constant agitation. The fire is then allowed to die away, and, after 24 hours, the oil is decanted as before. The product is called 'clarified oil,' and requires to be used with driers. It should be allowed to lay in the cistern for 2 or 3 months to clarify.

In the preparation of oil varnishes, the gum is melted as rapidly as possible, without discolouring or burning it; and when completely fused, the oil, also heated to nearly the boiling-point, is poured in, after which the mixture is boiled until it appears perfectly homogeneous and clear, like oil, when the heat is raised, the driers (if any are to be used) gradually and cautiously sprinkled in, and the boiling continued, with constant stirring, for 3 or 4 hours, or until a little, when cooled on a palette knife, feels strong and stringy between the fingers. The mixture is next allowed to cool considerably, but while still quite fluid, the turpentine, previously made moderately hot, is cautiously added, and the whole thoroughly incorporated. The varnish is then run through a filter or sieve into stone jars, cans, or other vessels, and set aside to clarify itself by subsidence. When no driers are used, the mixture of oil and gum is boiled until it runs perfectly clear, when it is removed from the fire, and, after it has cooled a little, the turpentine is added as before.

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[1] Methylated spirit is now generally used for making spirit varnishes, in place of duty-paid alcohol.

It is generally conceived that the more perfectly the gum is fused, or run, as it is called, the larger and stronger will be the product; and the longer the boiling of the 'gum' and oil is continued, within moderation, the freer the resulting varnish will work and cover. An excess of heat renders the varnish stringy, and injuries its flowing qualities. For pale varnishes as little heat as possible should be employed throughout the whole process. Good body varnishes should contain 1½ lb.; carriage, wainscot, and mahogany varnish, fully 1 lb.; and gold size, and black japan, fully ½ lb. of gum per gall., besides the asphaltum in the latter. Spirit varnishes should contain about 2½ lbs. of gum per gall. The use of too much driers is found to injure the brilliancy and transparency of the varnish. Copperas does not combine with varnish, but only hardens it; sugar of lead, however, dissolves in it to a greater or less extent. Boiling oil of turpentine combines very readily with melted copal, and it is an improvement on the common process to use it, either before or in conjunction with the oil, in the preparation of copal varnish that it is desired should be very white. Gums of difficult solubility are rendered more soluble by being exposed, in the state of powder, for some time to the air.

Varnishes, like wines, improve by age; and should always be kept as long as possible before use.

From the inflammable nature of the materials of which varnishes are composed, their manufacture should be only carried on in some detached building of little value, and built of uninflammable materials. When a pot of varnish, gum, or turpentine catches fire, it is most readily extinguished by closely covering it with a piece of stout woollen carpeting, which should be always kept at hand, ready for the purpose.

An excellent paper, by Mr. J. W. Niel, on the manufacture of varnishes, will be found in the 'Trans. of the Soc. of Arts,' vol. 49. See also the articles ALCOHOL, AMBER, COPAL, OILS, &c., in this work.

Varnish, Am'ber. *Prep.* 1. Take of amber (clear and pale), 6 lbs.; fuse it, add of hot clarified linseed oil, 2 galls.; boil until it 'strings well,' then let it cool a little, and add of oil of turpentine, 4 galls. or q. s. Nearly as pale as copal varnish; it soon becomes very hard, and is the most durable of the oil varnishes; but it requires some time before it is fit for polishing, unless the articles are 'stoved.' When required to dry and harden quicker, drying oil may be substituted for the linseed oil, or 'driers' may be added during the boiling.

2. Amber, 4 oz.; pale boiled oil, 1 quart; proceed as last. Very hard.

3. Pale transparent amber, 5 oz.; clarified linseed oil or pale boiled oil, and oil of turpentine, of each, 1 pint; as before.

Obs. Amber varnish is suited for all purposes where a very hard and durable oil varnish is required. The paler kind is superior to copal varnish, and is often mixed with the latter to increase its hardness and durability. The only objection to it is the difficulty of preparing it of a very pale colour. It may, however, be easily bleached with some fresh-slaked lime.

Varnish, Balloon. See FLEXIBLE VARNISH (*below*).

Varnish, Bessemer's. This consists of a pale oil copal varnish, diluted with about 6 times its volume of oil of turpentine, the mixture being subsequently agitated with about 1-30th part of dry slaked lime, and decanted after a few days' repose. 5 parts of the product mixed with 4 parts of bronze powder forms 'Bessemer's gold paint.'

Varnish, Black. *Prep.* 1. (BLACK AMBER VARNISH.) From amber, 1 lb.; fuse, add, of hot drying oil, ½ pint; powdered black resin. 3 oz.; asphaltum (Naples), 4 oz.; when properly incorporated and considerably cooled, add of oil of turpentine, 1 pint. This is the beautiful black varnish of the coachmakers.

2. (IRONWORK BLACK). From asphaltum, 48 lbs.; fuse, add of boiled oil, 10 galls.; red lead and litharge, of each, 7 lbs.; dried and powdered white copperas, 3 lbs.; boil for 2 hours, then add of dark gum amber (fused), 8 lbs.; hot linseed oil, 2 galls; boil for 2 hours longer, or until a little of the mass, when cooled, may be rolled into pills, then withdraw the heat, and afterwards thin it down with oil of turpentine, 30 galls. *Used* for the ironwork of carriages, and other nice purposes.

3. (BLACK JAPAN, BITUMINOUS VARNISH.)—*a.* From Naples asphaltum, 50 lbs.; dark gum animé, 8 lbs.; fuse, add of linseed oil, 12 galls.; boil as before, then add of dark gum amber, 10 lbs., previously fused and boiled with linseed oil, 2 galls.; next add of driers, q. s., and further proceed as ordered in No. 2. Excellent for either wood or metals.

b. From burnt umber, 8 oz.; true asphaltum, 4 oz.; boiled linseed oil, 1 gal.; grind the umber with a little of the oil; add it to the asphaltum, previously dissolved in a small quantity of the oil by heat; mix, add the remainder of the oil, boil, cool, and thin with a sufficient quantity of oil of turpentine. Flexible.

4. (BRUNSWICK BLACK.)—*a.* To asphalt, 2 lbs., fused in an iron pot, add of hot boiled oil, 1 pint; mix well, remove the pot from the fire, and, when cooled a little, add of oil of turpentine, 2 quarts. *Used* to blacken and

polish grates and ironwork. Some makers add driers.

b. From black pitch and gas-tar asphaltum, of each, 25 lbs.; boil gently for 5 hours, then add, of linseed oil, 8 galls.; litharge and red lead, of each, 10 lbs.; boil as before, and thin with oil of turpentine, 20 galls. Inferior to the last, but cheaper.

Varnish, Body. *Prep.* 1. From the finest African copal, 8 lbs.; drying oil, 2 galls.; oil of turpentine, 3½ galls.; proceed as for AMBER VARNISH. Very hard and durable.

2. Pale gum copal, 8lbs.; clarified oil, 2 galls; dried sugar of lead, ½ lb.; oil of turpentine, 3½ galls.; proceed as before, and mix the product, whilst still hot, with the following varnish:—pale gum animé, 8 lbs.; linseed oil, 2 galls.; dried white copperas, ¼ lb.; oil of turpentine, 3½ galls.; the mixed varnishes are to be immediately strained into the cans or cistern. Dries in about 6 hours in winter, and in about 4 hours in summer. *Used* for the bodies of coaches and other vehicles.

Varnish, Bookbinder's. *Prep.* Take of pale gum sandarach, 8 oz.; rectified spirit, 1 pint; dissolve by cold digestion, and frequent agitation. Used by binders, to varnish morocco leather book-covers. A similar varnish is also prepared from very pale shell-lac and wood naphtha.

Varnish, Cabinet-maker's. French polish is occasionally so called.

Varnish, Carriage. *Prep.* 1. (SPIRIT.) Take of gum sandarach, 1¼ lb.; very pale shell-lac, ¾lb.; very pale transparent resin, ½ lb.; rectified spirit of ·8221 (64 o. p.) 3 quarts; dissolve, and add of pure Canadian balsam, 1½ lb. *Used* for the internal parts of carriages, &c. Dries in 10 minutes or less.

2. (OIL.)—*a.* (Best pale.) Take of pale African copal, 8 lbs.; fuse, add of clarified linseed oil, 2½ galls.; boil until very stringy, then add of dried copperas and litharge, of each, ¼ lb.; again boil, thin with oil of turpentine, 5½ galls., mix, whilst both are hot, with the following varnish, and immediately strain the mixture into a covered vessel:—Gum animé, 8 lbs.; clarified linseed oil, 2½ galls.; dried sugar of lead and litharge, of each, ¼ lb.; boil as before, thin with oil of turpentine, 5½ galls. Dries in 4 hours in summer, and 6 in winter. *Used* for the wheels, springs, and carriage parts of coaches, and other vehicles, and by house painters, decorators. &c., who want a strong, quick-drying, and durable varnish.

b. (Second quality.) From gum animé ('sorts'), 8 lbs.; clarified oil, 3 galls.; litharge, 5 oz.; dried and powdered sugar of lead and white copperas, of each, 4 oz.; boil as last, and thin with oil of turpentine, 5½ galls. *Used* as the last.

Varnish, Chinese. *Prep.* From mastic and sandarach, of each, 2 oz.; rectified spirit (64 o. p.), 1 pint; dissolve. Dries in 6 minutes. Very tough and brilliant.

Varnish, Copal. *Prep.* 1. (OIL.)—From pale hard copal, 2 lbs.; fuse, add of hot drying oil, 1 pint; boil as before directed, and thin with oil of turpentine, 3 pints, or q. s. Dries hard in 12 to 24 hours.

b. From clear and pale African copal, 8 lbs.; pale drying oil, 2 galls.; rectified oil of turpentine, 3 galls.; proceed as before and immediately strain it into the store can or cistern. Very fine, hard, and durable.

2. (SPIRIT.)—*a.* From coarsely powdered copal and glass, of each, 4 oz.; alcohol of 90% (64 o. p.), 1 pint; camphor, ½ oz.; heat the mixture, with frequent stirring, in a water bath, so that the bubbles may be counted as they rise, until solution is complete, and, when cold, decant the clear portion.

b. From copal (which has been melted, dropped into water, and then dried and powdered), 4 oz.; gum sandarach, 6 oz.; mastic, 2 oz.; pure Chio turpentine, 3 oz.; powdered glass, 5 oz.; spirit of 90%, 1 quart; dissolve by a gentle heat. Dries rapidly.

3. (TURPENTINE.) To oil of turpentine, 1 pint, heated in a water bath, add, in small portions at a time, of powdered copal (prepared as above), 3 to 4 oz.; dissolve, &c., as before. Dries slowly, but is very pale and durable.

4. (JAPANNER'S COPAL VARNISH.) From pale African copal, 7 lbs.; pale drying oil, ½ gal.; oil of turpentine, 3 galls.; proceed as in No. 1. Dries in 20 to 60 minutes, and may be polished as soon as hard, particularly if stoved. See JAPANNING.

Obs. All copal varnishes, when properly made, are very hard and durable, though less so than those of amber; but they have the advantage over the latter of being paler. They are applied on coaches, pictures, polished metal, wood, and other objects requiring a good durable varnish. Animé is frequently substituted for copal in the copal varnishes of the shops. See BODY and CARRIAGE VARNISHES, COPAL, &c.

Varnish, Crystal. *Prep.* 1. From genuine pale Canada balsam and rectified oil of turpentine, equal parts. *Used* for maps, prints, drawings, and other articles of paper, and also to prepare tracing paper, and to transfer engravings.

2. Mastic, 3 oz.; rectified spirit, 1 pint; dissolve. *Used* to fix pencil drawings.

Varnish, Drying. Spirit copal varnish.

Varnish, Dutch. Lac and toy varnishes are often so called.

Varnish, Etch'ing. See ETCHING.

Varnish, Fat. See OIL VARNISH.

Varnish, Flexible. *Syn.* BALLOON VARNISH, CAOUTCHOUC V., INDIA-RUBBER V. *Prep.* 1. From India rubber (cut small), 1½ oz.; chloroform, ether (washed), or bisulphuret of carbon, 1 pint; digest in the cold until solution is complete. Dries as soon as it is laid on. Pure gutta percha may be substituted for India rubber.

2. India rubber, in shavings, 1 oz.; rectified mineral naphtha or benzol, 1 pint; digest at a gentle heat, in a closed vessel, and strain. Dries very badly, and never gets perfectly hard.

3. India rubber, 1 oz.; drying oil, 1 quart; dissolve by heat. Very tough; dries in about 48 hours.

4. Linseed oil, 1 gal.; dried white copperas and sugar of lead, of each, 3 oz.; litharge, 8 oz.; boil, with constant agitation, until it strings well, then cool slowly, and decant the clear portion. If too thick, thin it down with quick-dying linseed oil. The above are used for balloons, gas bags, &c. See BALLOON, CAOUTCHOUC, &c.

Varnish, Furniture. A solution of pure white wax, 1 part, in rectified oil of turpentine, 4 parts, frequently passes under this name. See BODY, CARRIAGE, and COPAL VARNISHES, &c.

Varnish, Gilder's. *Prep.* (Watin.) Pale gum-lac in grains, gamboge, dragon's blood, and annotta, of each, 12½ oz.; saffron, 3¼ oz.; dissolve each resin separately in 5 pints of alcohol of 90%, and make two separate tinctures of the dragon's blood and annnotta, with a like quantity of spirit; then mix the solutions in the proper proportions to produce the required shade. *Used* for gilded articles, &c.

Varnish, Glass. A solution of soluble glass. *Used* to render wood, &c., fire-proof.

Varnish, Gun-barrel. *Prep.* From shell-lac, 1½ oz.; dragon's blood, 3 drs.; rectified spirit, 1 quart. Applied after the barrels are 'browned.'

Varnish, Hair. *Prep.* From hog's bristles (chopped small), 1 part; drying oil, 10 parts; dissolve by heat. Said to be *used* to give cotton or linen cloth the appearance of horsehair.

Varnish, India-rubber. See FLEXIBLE VARNISH (*above*).

Varnish, Italian. *Prep.* Boil scio turpentine until brittle, powder it, and dissolve this in oil of turpentine. *Used* for prints, &c.

Varnish, Japan. Pale amber or copal varnish. *Used* for japanning tin, papier mâché, &c.

Varnish, Lac. *Prep.* 1. Pale seed-lac (or shell-lac), 8 oz.; rectified spirit, 1 quart; dissolve.

2. Substitute lac bleached with chlorine for seed-lac. Both are very tough, hard, and durable, but quite inflexible. Wood naphtha may be substituted for spirit. *Used* for pictures, metal, wood, or leather, and particularly for toys.

Varnish, Lac (Aqueous). *Prep.* From pale shell-lac, 5 oz.; borax, 1 oz.; water, 1 pint; digest at nearly the boiling-point until dissolved; then strain. Equal to the more costly spirit varnish for many purposes; it is an excellent vehicle for water colours, inks, &c.; when dry, it is waterproof.

Varnish, Lac (Coloured). *Syn.* LACQUER, BRASSWORK VARNISH. *Prep.* 1. Take of turmeric (ground), 1 lb.; rectified spirit, 2 galls.; macerate for a week, strain, with expression, and add to the tincture, gamboge, 1½ oz.; pale shell-lac, ¾ lb.; gum sandarach, 3½ lbs.; when dissolved, strain, and further add of good turpentine varnish, 1 quart. Gold coloured.

2. Seed-lac, 3 oz.; turmeric, 1 oz.; dragon's blood, ¼ oz.; rectified spirit, 1 pint; digest for a week, frequently shaking, then decant the clear portion. Deep gold coloured.

3. Spanish annotta, 3 lbs.; dragon's blood, 1 lb.; gum sandarach, 3½ lbs.; rectified spirit, 2 galls.; turpentine varnish, 1 quart; as before. Red coloured.

4. Gamboge, 1 oz.; Cape aloes, 3 oz.; pale shell-lac, 1 lb.; rectified spirit, 2 galls.; as bofore. Pale brass coloured.

5. Seed-lac, dragon's blood, annotta, and gamboge, of each, ¼ lb.; gum sandarach, 2 oz.; saffron, 1 oz.; rectified spirit, 1 gall. Resembles the last.

Obs. Lacquers are used upon polished metals and wood, to impart to them the appearance of gold. Articles in brass, tin plate, and pewter, or which are covered with tinfoil, are more especially so treated. As lacquers are required of different depths and shades of colour, it is best to keep a concentrated solution of each of the colouring ingredients ready, so that it may be added, at any time, to produce any desired tint.

Varnish, Mahogany. *Prep.* From gum animé ('sorts'), 8 lbs.; clarified oil, 3 galls.; litharge and powdered dried sugar of lead, of each, ¼ lb.; proceed as for body varnish, and thin with oil of turpentine, 5 galls., or q. s.

Varnish, Mastic. *Syn.* PICTURE VARNISH, TURPENTINE V., TINGRY'S ESSENCE V. *Prep.* 1. Take of pale and picked gum mastic, 5 lbs.; glass (pounded as small as barley, and well washed and dried), 3 lbs.; finest newly rectified oil of turpentine (lukewarm), 2 galls; put them into a clean 4-gall. tin bottle or can, bung down securely, and keep rolling it backwards and forwards pretty smartly on a counter, or any other solid place, for at least 4 hours, when, if the gum is all dissolved, the varnish may be decanted, strained through muslin into another bottle, and allowed to settle; if the solution is still incomplete, the agitation must be continued for some time longer, or the gentle warmth applied as well. Very fine.

2. (Second quality.) From mastic, 4 lbs.; oil of turpentine, 2 galls.; dissolve with heat.

Obs. Mastic varnish is much used for pictures, &c.; when good, it is tough, hard, brilliant, and colourless. It greatly improves by age, and, when possible, should never be used before it has been made at least a twelvemonth. Should it get 'chilled,' 1 lb. of well-washed siliceous sand should be made moderately hot, and added to each gallon, which must then be well agitated for 5 minutes, and afterwards allowed to settle.

Varnish, Oak. *Syn.* WAINSCOT VARNISH, COMMON TURPENTINE V. *Prep.* 1. Clear pale resin, 3½ lbs.; oil of turpentine, 1 gal.; dissolve.

2. To the last add of Canada balsam, 1 pint. Both are cheap and excellent common varnishes for wood or metal.

Varnish, Oil. The finer qualities are noticed under AMBER, BODY, CARRIAGE, and COPAL VARNISH; the following produces the ordinary oil varnish of the shops:—Take of good clear resin, 3 lbs.; drying oil, ½ gal.; melt, and thin with oil of turpentine, 2 quarts. A good and durable varnish for common work.

Varnish, Painter's. See CARRIAGE, COPAL, MAHOGANY, OAK, OIL, and other varnishes. The selection depending greatly on the colour and quality of the work.

Varnish, Patent Leather. This is carefully prepared drying oil. The skins being stretched on a board, and every trace of grease being removed from them by means of a mixture of fuller's earth and water, they are ready to receive the varnish, which is then spread upon them, very thinly, by means of a species of scraper. The first coat varnish consists of pale Prussian blue (that containing some alumina), 5 oz.; drying oil, 1 gal.; boiled to the consistence of single size, and, when cold, ground with a little vegetable black; it is stoved, and afterwards polished with fine-grained pumice;—the second coating resembles the first, excepting in having a little pure Prussian blue mixed with it;—the third coat varnish consists of a similar mixture, but the oil is boiled until it strings well, and a little more pure Prussian blue and vegetable black are added;—the last coat varnish, or finish, is the same as the third, but must contain ½ lb. of pure dark-coloured Prussian blue, and ¼ lb. of pure vegetable black per gal., to which a little oil copal or amber varnish is often added; each coat being duly stoved and pumiced before the next is applied. The heat of the stove or oven is commonly 120° Fahr. for 'enamelled skins,' as those of the calf and seal, intended for 'uppers;' and 175° to 180° for stout 'japan leather;' the exposure in the stove is commonly for 6 to 10 hours. The skins are next oiled, and grained. The 'graining' of the 'enamelled skins' is done by holding the skin in one hand, and with a curved board lined with cork (graining stick), lightly pressed upon the fleshy side, working it up and down until the proper effect is produced.

Varnish, Picture. Several varnishes, especially mastic varnish, are called by this name. Pale copal or mastic varnish is generally used for oil paintings, and crystal, white hard spirit, or mastic varnish, for water-colour drawings on paper.

Varnish, Printer's. Diluted with twice its volume of oil of turpentine, it forms a good common varnish.

Varnish, Sealing-wax. Black, red, or any coloured sealing-wax, broken small, with enough rectified spirit (or methylated spirit) to cover it, digested till dissolved. A most useful varnish for wood-work of electrical or chemical apparatus, for tops of corks, &c.

Varnish, Spirit. *Prep.* 1. (BROWN HARD.—*a.* From gum sandarach, 3 lbs.; pale seed-lac or shell-lac, 2 lbs.; rectified spirit (65 o. p.), 2 galls.; dissolve, and add of turpentine varnish, 1 quart; agitate well, strain (quickly) through gauze, and in a month decant the clear portion from the sediment. Very fine.

b. From seed-lac and yellow resin, of each, 1½ lb.; rectified spirit, 5 quarts; oil of turpentine, 1¼ pint; dissolve. Inferior to the last.

2. (WHITE HARD.)—*a.* From gum sandarach (picked), 5 lbs.; camphor, 2 oz.; washed and dried coarsely pounded glass, 3 lbs.; rectified spirit (65 o. p.), 7 quarts; proceed as in making mastic varnish; when strained, add of pure Canada balsam, 1 quart. Very pale, durable, and brilliant.

b. From gum sandarach and gum mastic, of each, picked, 4 oz.; coarsely powdered glass, 8 oz.; rectified spirit, 1 quart; dissolve, and add of pure Strasburg turpentine, 3 oz. Very fine.

3. (SOFT BRILLIANT.) From sandarach, 6 oz.; elemi (genuine), 4 oz.; animé, 1 oz.; camphor, ½ oz.; rectified spirit, 1 quart; as before.

4. (SCENTED.) To the preceding add some gum benzoin, balsam of Peru, balsam of Tolu, oil of lavender, or the essence of musk or ambergris. The first two can only be employed for dark varnishes.

Obs. The above varnishes are chiefly applied to articles of the toilette, as work-boxes, card-cases, &c.; but are also suitable to other articles, whether of paper, wood, linen, or metal, that require a brilliant and quick-drying varnish. They dry almost as soon as applied, and are usually hard enough to polish in 24 hours. They are, however, much less durable, and more liable to crack, than oil varnishes.

Varnish, Stopping-out. *Syn.* PETIT VERNIS, Fr. From lampblack, made into a paste with turpentine. *Used* by engravers. See ETCHING.

Varnish, Tingry's. MASTIC VARNISH.

Varnish, Toy. Similar to common spirit varnish, but using carefully rectified wood naptha as the solvent. See LAC and SPIRIT VARNISH.

Varnish, Transfer. *Syn.* MORDANT VARNISH. *Prep.* From mastic (in tears) and sandarach, of each, 4 oz.; rectified spirit, 1½ pint; dissolve, and add of pure Canada balsam, ½ pint. *Used* for transferring and fixing engravings or lithographs on wood, and for gilding, silvering, &c. See CRYSTAL VARNISH.

Varnish, Turpentine. See MASTIC and OAK VARNISH.

Varnish, Wainscot. See Oak Varnish.

Varnish, Wax. *Syn.* Milk of wax; Emulsio ceræ spirituosa, L. *Prep.* Take of white wax (pure), 1 lb.; melt it with as gentle a heat as possible, add of warm rectified spirit, sp. gr. ·830 (60 o. p.), 1 pint; mix perfectly, and pour the liquid out upon a cold porphyry slab; next grind it with a muller to a perfectly smooth paste, adding more spirit, as required; put the paste into a marble mortar, make an emulsion with water, 3½ pints, gradually added, and strain it through muslin. *Used* as a varnish for paintings; when dry, a hot iron is passed over it, or heat is otherwise evenly applied, so as to fuse it, and render it transparent, after which, when quite cold, it is polished with a clean linen cloth. The most protective of all varnishes.

2. Wax (pure), 5 oz.; oil of turpentine, 1 quart; dissolve. *Used* for furniture. See Sealing-wax Varnish.

Varnish, White. See Spirit Varnish, 2 *a* and *b*.

VAR'NISHING. To give the highest degree of lustre to varnish after it is laid on, as well as to remove the marks of the brush, it undergoes the operation of polishing. This is performed by first rubbing it with very finely powdered pumice-stone and water, and, afterwards, with an oiled rag and tripoli, until the required polish is produced. The surface is, last of all, cleaned with soft linen cloths, cleared of all greasiness with powdered starch, and then rubbed bright with the palm of the hand.

In varnishing, great care must be taken that the surface is free from grease or smoke; as, unless this be the case, the best oil or turpentine varnish in the world will not dry and harden. Old articles are usually washed with soap and water, by the painters, before being varnished, to prevent any misadventure of the kind alluded to.

VEAL. "The grain should be close, firm, and white, and the fat of a pinkish-white, not a dead white, and the kidneys well covered with a thick white fat." (Soyer.)

Veal, like pork, requires to be well dressed, to develop its nutritive qualities. It should also be eaten fresh, as a peculiar principle is generated in it when improperly kept, which acts as a malignant poison. See Roasting, &c.

VEG'ETABLE AL'KALI†. Potassa.

VEGETABLE JUICES. See *below*.

VEGETABLES. Vegetables are organic beings, which are distinguished from animals by a number of characteristics, but, like them, are composed of certain proximate principles, or compounds, which possess a high degree of scientific interest, and in many cases are invaluable to man. Among the most important of these are—albumen, gluten, gum, lignin, starch, sugar, tannin, wax, the fixed and volatile oils, the resins, and gum-resins, the alkaloids, and innumerable forms of extractive matter. Several of these substances are noticed under their respective names.

The method of propagating plants from their seeds, depending on their simple exposure, at the proper season, to warmth and moisture, under the protection of the soil, is well known; that by propagation from 'slips' and 'cuttings,' which will doubtless prove interesting to the amateur gardener, are noticed below.

The choice of slips and cuttings should be made from the side shoots of trees and plants, and, when possible, from such as recline towards the ground, observing, when they are removed by the knife, to leave a little wood of a former year or season's growth attached to them, as such are found to take root more readily than when they are wholly composed of new wood. The time to take slips or cuttings is as soon as the sap gets into full motion. Before setting them the latter should be cut across, just below an eye or joint, with as smooth a section as possible, observing not to injure the bud. The superfluous leaves may be removed, but a sufficient number should be left on for the purposes of vegetation. The common practice of removing all or nearly all the leaves of cuttings is injudicious. In some cases leaves alone will strike root. When cuttings are set in pots, they should be so placed as to reach to the bottom and touch the sides throughout their whole length, when they will seldom fail to become rooted plants. In the case of tubular-stalked plants, it is said to be advantageous to insert both ends into the soil, each of which will take root, and may then be divided, when two plants will be produced instead of one. An equable temperature, a moist atmosphere, a shady situation, and a moderate supply of water, are the principal requisites to induce speedy rooting. Excess of any of these is prejudicial. When the size of the cuttings admit, it is better to place them under a hand- or bell-glass, which will preserve a constant degree of heat, and prevent evaporation from the surface of the leaves, which is the most common cause of their dying, especially in hot, dry weather.

Qual. The vegetable kingdom furnishes by far the larger portion of the food of man, and indirectly, perhaps, the whole of it. The great value of culinary vegetables and fruit in a mixed diet need not be insisted on, since it is a fact which is almost universally known and appreciated.

In the choice of culinary vegetables, observe, that if they are stiff and break freely and crisply, they are fresh, and fit for food; if, on the contrary, they have a flabby appearance, or are soft or discoloured, they are stale, and should be rejected.

The dose of the generality of vegetable substances that exercise no very marked action on the human frame is about ½ to 1 dr. of the powder, night and morning; or 1 oz., or q. s. to impart a moderately strong colour or taste, may be infused, or boiled, in 1 pint of water, and a wine-glassful or thereabouts, taken 2 or 3 times a day.

Collection and pres. The following general directions are given in the London Pharmacopœia for the collection and preservation of vegetable substances—(vegetabilia Ph. L.):—

"Vegetables are to be collected in dry weather, and when neither wet with rain nor dew; they are to be collected annually, and are not to be kept beyond a year.

"Barks are to be collected at that season in which they can be most easily separated from the wood." Spring is the season here alluded to; as at this time, after the sap begins to ascend, the bark is, in general, very easily separated.

"Flowers are to be collected recently blown." The red rose, however, must be gathered before the buds are expanded.

"Fruits and seeds are to be collected when ripe.

"Herbs and leaves are to be gathered after the flowers have expanded, and before the seeds are mature.

"Roots and rhizomes (underground stems), for the most part, are to be dug up after the old leaves and stalks have fallen, and before the new ones appear." ("Roots, which are required to be preserved fresh, should be buried in dry sand."—Ph. L. 1836.)

"Seeds are to be collected when they are ripe, and before they drop from the plant." ("They ought to be preserved in their seed vessels."—Ph. L. 1836.)

"The different parts of vegetables are to be kept dried for use, except where we shall otherwise direct. Expose those you wish to dry, within a short time after they have been gathered, in shallow wicker baskets, to a gentle heat, in a dark place, and where there is a current of air. Then, the moisture being driven off, gradually increase the heat to 150° Fahr., in order that they may be dried. Finally, preserve the more delicate parts, viz., flowers and leaves, in black glass vessels, well closed, and keep the rest in proper vessels, preventing the access of light and moisture."

Fruits, culinary vegetables, and vegetable juice, of every class, may be preserved for any length of time by several of the methods described under PUTREFACTION. On the small scale, the following method is often adopted:—The substances to be preserved are put into strong glass or stoneware bottles, with necks of a proper size, which are then corked with the greatest care, tied or wired, and luted with a mixture of lime and soft cheese, or with a paste formed of linseed meal and water, spread on rags; or, tin cases are employed, and are soldered up instead of being corked. The bottles are then placed in an oven, the temperature of which is cautiously raised to fully 212° Fahr.; or, they are enclosed, separately, in canvas bags, and put into a copper of water to which some salt has been added, which is then gradually heated until it boils, and thus kept for 15 or 20 minutes; the whole is next left to cool, when the bottles are taken out and carefully examined before being laid by, lest they should have cracked, or the lute have given way.

Herbs and flowers are now generally preserved for distillation by means of common salt. The objection which is raised against the use of fresh aromatic plants is thus obviated, whilst the odours of the distilled products are rendered superior to those obtained from either the recent or dried plant, fruit, or flower, without the great loss, inconvenience, or trouble attending the common methods. Besides, many aromatic and odorous substances almost entirely lose their properties by drying; while most of them yield more oil, and that of a finer quality, in the fresh than in the dried state. The odours of roses, elder flowers, and a variety of others, are vastly improved by this treatment, and these flowers may thus be preserved with ease and safety from season to season, or even longer, if required. The process simply consists in intimately mixing the flowers, or other vegetables, soon after being gathered, with about ¼ their weight, or less, of good dry salt, and ramming down the mixture as tightly as possible in strong casks. The casks are then placed in a cold cellar, and covered with boards, on which heavy weights are put, to keep the mass tight and close. See FRUITS, PUTREFACTION, &c.

Juices of Vegetables. 1. (EXPRESSED VEGETABLE JUICE, SIMPLE V. J.; SUCCI EXPRESSI, L.) These are obtained by bruising the fresh leaves, or other vegetable matter, in a marble mortar, or in a mill, and expressing the liquid portion by means of a powerful screw press. After defecation for 12 or 14 hours in a cold situation, the juice is either decanted or filtered from the feculous sediment, and is next heated for some minutes to about 185° Fahr., to coagulate albuminous matter. The clear portion is subsequently separated as before, and the product preserved for use in well-closed and well-filled bottles, in a cool situation. Some plants, as borage, cabbage, &c., require the addition of ⅛ of water before being pressed. The expression of the juice of lemons, oranges, quinces, &c., is facilitated by previously mixing the pulp with clean chopped straw. Buckthorn berries, mulberries, &c., after being crushed between the hands, are commonly left for 3 or 4 days to undergo a slight fermentation, before pressing them.

The expression of the juices of the narcotic plants, and of some other vegetables, has lately assumed considerable interest, from these juices being now extensively used in pharmacy for the preparation of extracts and the preserved juices, noticed below. It appears that the juice of young plants just coming into flower yield only ⅔ the amount of extract which may be obtained from the same quantity of juice expressed from the matured plant, or ject, the apartments may be supplied with air that has been previously warmed by passing through a heated chamber, on the principle recommended by Dr. Reid; but care must be taken that, in warming the air, we do not over-heat it, nor contaminate it.

A sufficient supply of light, another powerful sanitary agent, is now regarded as nearly as essential as thorough ventilation, and the two are commonly treated of together. According to Palladio, the opening of windows should not exceed a fourth, nor be less than a fifth, of the length of the side of a room, and should be in height two and one sixth times the width. Mr. Gwilt, another high authority on this subject, has given as a definite rule, that we should allow 1 square foot of glass to every 100 cubic feet of space in any apartment or enclosure. A great deal must, however, depend on the shape of the apartment; but, in all cases, care should be taken that the windows are placed at the longest side of the room, and not at the narrowest, or the end of it. A southern aspect affords the most light and heat; a northern one, the most diffused and least variable light, and is hence usually chosen by artists for their studios.

VERA'TRINE. $C_{32}H_{52}N_2O_8$. *Syn.* VERATRIA, VERATRINA, SABADILLINE; VERATRIA (B. P., Ph. L. & E.), L. An alkaloid discovered by Pelletier and Caventou, in the seeds of *Asagreæ officinalis* (sabadilla), and in the rhizomes of *Veratrum album* (white hellebore).

Prep. 1. (Ph. E.) Digest sabadilla seeds in boiling water for 24 hours, then squeeze them, dry them thoroughly by a gentle heat, beat them in a mortar, and separate the seeds from the capsules by agitation in a deep and narrow vessel; next grind the seeds in a coffee-mill, and exhaust them by percolation with rectified spirit; concentrate the resulting tincture by distillation, so long as no deposit forms, and pour the residuum, whilst still hot, into 12 times its volume of cold water; then filter through calico, and wash the residuum on the filter as long as the washings yield a precipitate with ammonia; unite the filtered liquid with the washings, add ammonia in excess, collect the precipitate on a filter, wash it slightly with cold water, and dry it first by imbibition with filtering paper, and then in the vapour bath. "The product is not pure, but sufficiently so for medical use. From this coloured substance it may be obtained white, but at considerable loss, by solution in very weak hydrochloric acid, decolorisation with animal charcoal, and reprecipitation with ammonia."

2. (Ph. L. 1836.) This is the same in principle as the last; a tincture is formed by boiling the seeds in rectified spirit, which is then evaporated to a syrup, dissolved in very dilute sulphuric acid, the veratrine precipitated with magnesia, redissolved in very dilute acid, treated with animal charcoal, the filtrate again evaporated to a syrup, and precipitated with ammonia; it is, lastly, washed and dried.

3. By means of ether, as noticed under ALKALOID and ACONITINE. This is by far the best method.

Prop. Pure veratrine is perfectly white; but as usually met with, it is a yellowish or greenish-white powder; it is highly acrid; uncrystallisable; scarcely soluble in water, soluble in ether, and freely soluble in hot alcohol; heated to about 125° Fahr., it fuses like wax, and solidifies, upon cooling, to a transparent yellow mass. With the dilute acid it forms salts, which are either amorphous or difficultly crystallisable. The smallest possible portion of its powder causes violent sneezing.

Tests. 1. Potassa, ammonia, and their carbonates, give flocculent white precipitates, which at first are not crystalline under the microscope, but which, after some minutes, assume the appearance of small scattered clusters of short prismatic crystals; they are insoluble in excess of potassa and its carbonate, and only very slightly so in excess of ammonia.—2. With sulphuric acid it strikes an intense red colour, changing afterwards to crimson, and finally to violet.—3. A dilute acetic solution of veratrine is turned to a superb red by strong sulphuric acid.

Veratrine is distinguished from brucine and the other alkaloids by its fusibility—by the crystalline form of its precipitate with potassa, and—by its reaction with oil of vitriol.

Uses, &c. "As an external application, it has been efficaciously employed by Magendie in France, and by Dr. Turnbull in this country; but the extravagant eulogies of the latter have not tended to confirm the reputation of this remedy." (Dr. A. T. Thomson.) From 6 to 12 grs., dissolved in 1 fl. oz. of rectified spirit, as a liniment; or 30 grs., mixed with 1 dr. of olive oil, and 1 oz. of lard, as an ointment, have been occasionally found very serviceable in neuralgia, and other like painful affections, and in gouty and rheumatic paralysis. As an internal remedy, it possesses no advantage, as it merely acts as a violent and depressing cathartic.—*Dose.* $\frac{1}{32}$ to $\frac{1}{16}$ gr. In larger doses, it acts as a powerful irritant poison. For antidotes, &c., see ALKALOID.

VERA'TRUM. See WHITE HELLEBORE.

VER'DIGRIS. *Syn.* ÆRUGO, L.; VERT-DE-GRIS, Fr. This is a mixture of several basic acetates of copper which have a green or blue colour. It is obtained in the wine districts of the south of Europe, by the action of refuse grapes, from which the juice has been expressed, on thin sheets of copper When pure, it should dissolve, almost entirely, and without effervescence, in dilute sulphuric acid. It is very poisonous; for antidotes, see COPPER.

An inferior quality of verdigris is now prepared from pommage, or apple marc, in the cider districts of England.

Verdigris, Distilled. *Syn.* CRYSTALLISED VERDIGRIS. This name is applied to the normal acetate of copper, which is prepared in the wine districts by dissolving ordinary verdigris, 1 part, in good distilled vinegar, 2 parts; the operation being performed in a copper vessel, by the aid of a gentle heat and agitation; the solution is afterwards slowly evaporated until a pellicle begins to form on the surface, when it is transferred into glazed earthen pans ('oulas'), in each of which is placed 2 or 3 cleft sticks, and it is then left in a warm apartment for 14 or 15 days, to crystallise.

A spurious article is often prepared by adding a solution of sulphate of copper, 12½ lbs., to a solution of sugar of lead, 19 lbs., or q. s., and filtering, evaporating, and crystallising the mixture.

There is an acetate of copper and lime which resembles distilled verdigris in colour. It was manufactured pretty extensively in Scotland some years ago, and fetched a high price, till Dr. Ure published an analysis of it in the 'Edin. Phil. Trans.' It is much inferior for all uses in the arts.

Pure distilled verdigris is entirely soluble in water, and is not precipitated on the addition of sulphuric acid or of ammonia in excess.

Verdigris, English. *Prep.* Blue vitriol, 24 lbs.; white vitriol, 16 lbs.; sugar of lead, 12 lbs.; alum, 2 lbs.; (all coarsely powdered;) mix, and heat them in a pot over the fire until they unite into a mass. Sold by fraudulent dealers for foreign verdigris.

VER'DITER. *Syn.* BLUE VERDITER, REFINER'S VERDITER; CENDRES BLEUES, Fr. A blue pigment, obtained by adding chalk, whiting, or milk of lime, to a solution of copper in nitric acid; or, by triturating recently precipitated and still moist carbonate of oxide of copper with hydrate of lime.

Prep. A quantity of whiting or milk of lime is put into a tub, and upon this the solution of copper is poured; the mixture is stirred every day for some hours together, until the liquor loses its colour; it is then poured off, and more solution of copper added; this is repeated until the whiting or lime has acquired the proper colour; the whole is then washed with water, drained, spread on chalk stones, and dried in the sun.

Obs. The cupreous solution employed in the above process is made by neutralising the nitric solution obtained from the refiners of gold and silver, by heating it along with metallic copper. For the finer qualities of verditer the lime should be of the purest kind, and the cupreous precipitate should be carefully triturated with it, after it is nearly dry, by which a fine velvety appearance is produced. The 'cendres bleues en pâtes' of the French differ from the above mainly in a solution of chloride of copper being employed, and in the resulting green precipitate being turned blue by the action of carbonate of potassa. Verditer is made into crayons whilst moist, or dried into a powder, or it is used as a water colour in the moist state.

Verditer, Green. *Syn.* BREMEN GREEN. The process for refiner's verditer frequently miscarries, and a green colour is produced instead of a blue one. It may also be obtained directly by omitting the 'blueing up' with carbonate of potassa, mentioned above.

VER'JUICE. *Syn.* AGRESTA, OMPHACIUM, L. The expressed juice of unripe grapes. The term is also often extended to the expressed juice of the wild or crab apple. It was formerly used as an astringent and refrigerant in medicine; but it is now principally employed as an ingredient in sauces, ragoûts, &c.

VERMICEL'LI. This, like macaroni, is prepared from a stiff paste made of a peculiar fine kind of granular wheat flour, called semoule, which is mixed up with hot water, and, after being well kneaded, is formed into small ribands, cylinders, or tubes, by being placed in a vertical cylinder press, the bottom of which is filled with proper-shaped holes, through which it is driven by an iron plate or 'follower' being forced down by a powerful screw. The pieces that protrude are broken off, twisted into any desired shape upon paper, and dried. Those in the form of fillets or ribands are called 'lazagnes.' See MACARONI.

VER'MIFUGES. *Syn.* ANTHELMINTICS; ANTHELMINTICA, HELMINTHAGOGA, VERMIFUGA, L. Medicines employed to destroy or expel intestinal worms. Some of these, as coarsely powdered tin- and iron-filings and cowhage, act as mechanical agents, by irritating the worms; others have a specific action upon worms, as male fern, kousso, santonin, &c.; others, again, owe their power to their action as purgatives, as calomel, gamboge, jalap, &c. See WORMS.

VERMIL'ION. *Syn.* FACTITIOUS CINNABAR, RED SULPHIDE OF MERCURY, RED SULPHURET OF MERCURY. This article may be prepared both in the moist and dry way; that of commerce is almost entirely obtained by the latter.

Prep. 1. By sublimation. Take of pure mercury, 202 parts; pure sulphur, 33 parts; fuse them together by a gentle heat, observing not to allow the mass to take fire; when fused, cover over the vessel, and, when the whole has become cold, powder the mass, and sublime it in a closed vessel, so placed in a furnace that the flame may freely circulate and play upon it to about half its height, the heat being at first gradually applied, and afterwards augmented until the lower part of the subliming vessel becomes red hot; the cold sublimate is broken into pieces, ground along with water to a fine powder, elutriated, passed through a sieve, and dried. *Prod.* Fully 112% of the weight of the mercury employed.

2. In the humid way. (Brunner.) Take of pure quicksilver, 300 parts; pure sublimed sul-

phur, 114 parts; triturate them together for several hours, until a perfect 'ethiops' is formed, add gradually of caustic potassa, 75 parts, (dissolved in) water, 450 parts; continue the trituration for some time longer, then gently heat the mixture in an iron vessel, at first constantly stirring, but afterwards only from time to time, observing to keep the heat at about 113°, or, at all events, under 122° Fahr., and to add fresh water, to compensate for the portion evaporated. When the colour begins to redden, great caution is requisite to preserve the mixture at the lower temperature, and to keep the sulphuret of mercury perfectly pulverulent; as soon as the colour becomes nearly 'fine,' the process must be conducted with increased caution, and at a lower heat for some hours, or until a rich colour is produced, when the newly formed vermilion must be elutriated with water, to separate any particles of metallic mercury, and carefully dried. *Prod.* 332 parts of vermilion, equal in brilliancy to the finest Chinese.

Obs. It has been said that the rich tone of Chinese vermilion may be imitated by adding to the materials 1% of sulphuret of antimony, and by digesting the ground sublimate, first in a solution of sulphuret of potassium, and next in diluted hydrochloric acid, after which it must be well edulcorated with water, and dried. Our own belief is, that the finer qualities of vermilion owe their superiority of shade more to the care bestowed on their sublimation, and the extent to which their division is carried, than to anything else.

Vermilion is a beautiful and permanent red pigment, and works and covers well both in oil and water.

VERT'IGO. Dizziness and swimming of the head. In its more serious forms there is more or less mental confusion, the objects around the patient appear in motion, the ears are oppressed with strange sounds, and visible illusions are experienced, whether the eyes be closed or open, and in darkness as well as in the light. The causes are fulness of the vessels of the head, nervous derangement, general debility, hæmorrhage, the use of narcotics, an overloaded stomach, and, in some cases, an empty one. It is also frequently symptomatic of fevers and inflammations, and of a condition threatening apoplexy. The treatment must be varied, according to the cause and the peculiar habit or condition of the patient.

VES'ICANTS. *Syn.* EPISPASTICS; EPISPASTICA, VESICANTIA, L. Substances which vesicate, or raise blisters. Among these are the cantharis or blistering fly, mezereon, croton oil, boiling water, &c.; the first only of which is now in common use in England.

"It is a principle sufficiently established with regard to the living system, that, where a morbid action exists, it may often be removed by inducing an action of a different kind, in the same or a neighbouring part. On this principle is explained the utility of blisters in local inflammation and spasmodic action, and it regulates their application in pneumonia, gastritis, hepatitis, phrenitis, angina, rheumatism, colic and spasmodic affections of the stomach; diseases in which they are employed with the most marked advantage. A similar principle exists with respect to pain; exciting one pain often relieves another. Hence blisters often give relief in toothache, and some other painful affections. Lastly, blisters, by their operation, communicate a stimulus to the whole system, and raise the vigour of the circulation. Hence, in part, their utility in fevers of the typhoid kind, though in such cases they are used with still more advantage to obviate or remove local inflammation." ('Med. Lex.')

Blisters are commonly prepared with cantharides plaster, or with some other preparation of cantharides; and, in the former case, are usually lightly covered with the powdered fly. In order to prevent the action of the cantharides upon the mucous membrane of the bladder, blistering plasters are often sprinkled with a little powdered camphor, or, better still, are moistened with camphorated ether, which leaves a thin layer of camphor. In all these cases the layer should not be too thick, for in that case the plaster would not take effect.

When it is not wished to maintain a discharge from the blistered part, it is sufficient to make a puncture in the vesicle, to let out the fluid; but when the case requires the blister to be 'kept open,' as it is called, the whole of the detached cuticle is carefully removed with a pair of scissors, and the part is dressed with either the ointment of cantharides or of savine, at first more or less diluted with lard, or simple ointment, with an occasional dressing of resin cerate. According to Mr. Crowther, the blistered surface is best kept clean by daily fomentation with warm water.

Of late years, to obviate the unpleasant effects occasionally arising from the common blister, various compounds having cantharides for their base have been wrought before the public. Of these, the vesicating collodion noticed under COLLODION is the most convenient and effective. The following also deserve notice:—

1. Take of cantharides, in fine powder, 2 parts; spermaceti, 2 parts; olive oil, 4 parts; white wax, 8 parts; water, 10 parts; simmer, with constant agitation, for 2 hours, strain through flannel, separate the plaster from the water, gently remelt it with common turpentine, 1 part, and spread the mass whilst still fluid. This nearly resembles the form recommended by MM. Henry and Guibourt.

2. (P. Cod.) Distil off the ether from a concentrated ethereal tincture of cantharides, melt the oily residue with twice its weight of white wax, and spread the mixture on thin oiled silk, or on cloth prepared with wax plaster.

3. (Oettinger.) Cantharidal ether (prepared from cantharides, 1 part; ether, 2 parts), and sulphuric ether, of each, 10 dr.; turpentine and black resin, of each, 2½ drs.; mix, dissolve, and apply it to the surface of stretched silk or taffeta which has been previously prepared with two coatings of a solution of isinglass.

Obs. The above compounds are spread on leather, linen, paper, silk, oiled silk, taffeta, &c., and then form the numerous compounds vended under the names of—blistering tissue, charta epispastica, rannus vesicatorius, papier epispastique, sparadrapum vesicatorium, taffetas vesicans, tela vesicatoria, &c.

Acetic extract of cantharides, croton oil, or extract of mezereon, is sometimes substituted for the ethereal extract ordered in the above formulæ.

The 'papier epispastique' of Vée is prepared of three strengths, which are respectively distinguished by the colours white, green, and red. The composition is made by boiling powdered cantharides for an hour with water, lard, and green ointment, or with lard coloured with alkanet root, adding white wax to the strained fats, and spreading the mixture whilst fluid:—No. 1 is made with 10 oz. of cantharides to 4 lbs. of lard; No. 2 of 1 lb. of cantharides to 8 lbs. of green ointment; and No. 3, of 1½ lb. of flies to 8 lbs. of reddened lard. To each are added 2 lbs. of white wax. (Dorvault.)

The magistral blister of Valleix is a revival of the vesicating epithem. See Blister, Cantharides, Collodion, &c., and *below*.

VESICA'TION. The formation of a blister is a vital process, and its success may be taken as a proof of the presence of life. Hence, a French physician, Dr. Mandl, has suggested such a stimulation of the skin as would ordinarily cause a blister as a test of life, in those cases of long-continued trance which we occasionally hear of, where all the functions of life seem to be extinct. Dr. Mandl's plan is to apply a stick of lunar caustic. The application of a little strong vinegar of cantharides, or other cantharidal blister, of the size of a sixpenny piece, or of two or three spoonfuls of boiling water by means of a bent tube of like diameter, is however, more certain and satisfactory.

VES'ICATORIN. *Syn.* Canthar'idin, Cantharidina, Cantharides-camphor. The blistering principle of Spanish flies, discovered by M. Robiquet.

Prep. 1. (P. Cod.) Exhaust powdered cantharides with concentrated alcohol, by percolation; distil off the spirit from the filtered tincture, and leave the residuum to deposit crystals; these may be purified by dissolving them in boiling alcohol, digestion with animal charcoal, filtration whilst hot, and crystallising by refrigeration.

2. (Thierry.) Macerate cantharides (in coarse powder) for several days in ether, in a closed displacement apparatus; then, after the whole of the soluble matter has been extracted by the addition of fresh portions of ether, pour on sufficient water to displace the retained ether; next distil off the ether, dissolve the remaining extract in boiling alcohol, filter while hot, and abandon the filtrate to spontaneous evaporation. *Prod.* ·5%.

3. Digest the aqueous extract of cantharides in hot alcohol, filter, evaporate to dryness, digest the residuum in sulphuric ether, evaporate, and slightly wash the resulting crystals with cold alcohol.

Prop., &c. Micaceous plates resembling spermaceti; fusible; vaporizable; insoluble in water; soluble in ether, oils, acetic acid, and hot alcohol; powerfully vesicant and poisonous. Its vapour, even at ordinary temperatures, frequently produces temporary blindness. The 1-100th part of a grain, placed on a piece of paper, and applied to the edge of the lower lip, caused small blisters in 15 minutes, which, when rubbed with a little simple cerate, extended over a large surface, and covered both lips with blisters. (Robiquet.)

VETCH. The common name of various leguminous plants of the genera *Vicia* and *Ervum*, now much cultivated as green fodder for milch cows and working stock. The seeds (tares) were formerly reputed detersive and astringent. Those of "the Canadian variety make good bread." (Lindley.)

VET'ERINARY MEDICINES. The common form of medicine for horses is that popularly known as horse balls. They are usually prepared by mixing the dry ingredients, in the state of powder, with a sufficient quantity of treacle, or syrup bottoms, to give the mass a proper consistence for rolling into balls; adding, when necessary, linseed meal, or any other simple powder, to increase the bulk. The usual practice among the veterinary druggists is to keep a compound known in the trade as 'ball-mass,' or 'common mass,' ready prepared to give form and bulk to more active ingredients. This is usually made of about equal parts of linseed meal and treacle, together with a little palm or lard, thoroughly incorporated by kneading with the hands; and it is kept in a cool situation, tied over to prevent it drying and hardening. For use, the ball-masses are either rolled or moulded into small cylinders of about 1½ to 1¾ oz. in weight; and in size, from 2 to 2¼ inches long, and from about ½ to ⅞ of an inch in diameter; and they are wrapped in soft paper, which is administered with them. Those for dogs are commonly formed into large boluses or nut-like pieces. The common practice, in some houses, of adding a little salt of tartar or acetate of potassa to ball-masses kept in stock, for the purpose of preserving them in a soft state, is not to be commended, since these articles decompose many of the saline and mineral compounds which are subsequently added to them.

Medicines for neat cattle are always administered in a liquid form, popularly called drenches. A similar plan is adopted with small cattle, as sheep and goats. For these, however, the quantity should seldom exceed ¼ pint. In all cases, drenches should be very slowly administered.

The following are a few useful horse-balls:—

ALTERATIVE BALLS.—1. Levigated sulphuret of antimony, sulphur, and linseed meal, of each, 8 oz.; nitre, 4 oz.; palm oil, q. s. to form a mass; for 12 balls. One to be taken every day, or every other day.

2. (Bell.) Sulphuret of antimony, nitre, sulphur, and ethiop's mineral, of each, 3 oz.; soft soap, 10 oz.; oil of juniper, ½ oz.; for 12 balls. As the last.

3. (White.) Sulphuret of antimony, caraways, and treacle, of each, ¼ oz.; for one ball. As the last.

CORDIAL BALLS.—1. (Blaine.) Coriander seed, caraway, and gentian, of each, 8 oz.; ginger, 4 oz.; oil of aniseed, ½ oz.; honey or palm oil, q. s. to form a mass. Cordial, warming, and stomachic.—*Dose.* 1½ oz.

2. (Hill.) Anise, caraway, and cumin seed, of each, 4 lbs; ginger, 2 lbs.; treacle, q. s.; divide into 1¾-oz. balls. *Prod.* 21 lbs.

COUGH BALLS.—1. (Blaine.) Ipecacuanha, 1 dr.; camphor, 2 drs.; honey, q. s. to form a ball. One night and morning.

2. (B. Clark.) Emetic tartar and benzoin, of each, 2 drs.; squills, 4 drs.; spermaceti and balsam of copaiba, of each, 1 oz.; elecampane and sulphur, of each, 2 oz.; syrup of poppies, q. s. to mix; for 8 balls. As the last.

DIURETIC BALLS.—1. (Bracy Clark.) Nitre and common turpentine, of each, 1 lb.; Castile soap, ½ lb.; barley meal, 2½ lbs., or q. s. For common-sized balls.

2. (Morton.) Digitalis, 1 oz.; aloes, 2 oz.; liquorice, 13 oz.; honey or Barbadoes tar, q. s. to mix; for 1-oz. balls. One, twice a day, with care.

PHYSIC BALLS, PURGING B., CATHARTIC B. —1. Aloes and hard soap, of each, 5 oz.; salt of tartar and cayenne pepper, of each, 1 oz.; melt together. For 8 balls.

2. (Vet. Coll.)—*a.* (Common physic ball.) Aloes, 8 oz.; treacle, 3 oz.; olive oil, 1 oz.; melted together.—*Dose.* 1 to 1½ oz.

b. (Stronger ball.) To each dose of the last, add of croton oil, 4 to 8 drops.

Obs. The *dose* of the above is 1 ball, fasting, in the morning, preceded by a bran mash, on one or two successive nights, and followed by gentle exercise until the ball begins to operate.

WORM BALLS.—1. Barbadoes aloes, 5 drs.; calomel and ginger, of each, 2 drs.; oil of cloves, 12 drops; treacle, q. s. for a ball.

2. (J. Bell & Co.) Barbadoes aloes, 5 to 8 drs.; powdered tin, ethiop's mineral, and ginger, of each, 2 drs.; oils of aniseed and savine, of each, 20 drops; treacle, q. s. for a ball.

3. (Clater.) Sulphur and emetic tartar, of each, 1 dr.; linseed meal, 4 drs.; palm oil, q. s. to form a ball. One every morning, having prepared the animal with a physic ball containing 1 dr. of calomel. See BALLS; also Tuson's 'Veterinary Pharmacopœia.'

VIN'EGAR. *Syn.* ACETUM, L.; VINAIGRE, Fr. Dilute acetic acid, more or less contaminated with gum, sugar, and vegetable matter.

1. MALT VINEGAR; ACETUM, BRITISH VINEGAR (B. P.); ACETUM BRITANNICUM (Ph. L. & E.), L. This is the ordinary coloured vinegar consumed in this country, and is correctly described in the Ph. L. as "impure (dilute) acetic acid, prepared by fermentation from an infusion of malt (malt-wort)."

In the manufacture of MALT VINEGAR a mixture of malt and barley is mashed with hot water, and the resulting wort fermented, as in the common process of brewing. The liquor is then run into barrels, placed endways, tied over with coarse canvas, and arranged side by side in darkened chambers, moderately heated by a stove, and freely supplied with air. Here it remains till the acetous fermentation is nearly complete, which usually occupies several weeks, or even months. The newly formed vinegar is next run off into two large tuns, furnished with false bottoms, on which some 'rape' (the pressed cake from making domestic wines, or the green twigs or cuttings of vines) is placed. One of these vessels is wholly, and the other only about 3-4ths, filled. The fermentation recommences, and the acetification proceeds more rapidly in the latter than in the former tun, and the liquor it contains consequently matures the sooner. When fit for sale, a portion of the vinegar is withdrawn from the smaller quantity, and its place supplied with a like quantity from the full tun, and this in its turn is refilled from the barrels before noticed. This process is carried on with a number of tuns at once, which are all worked in pairs.

Prop., &c. The general properties of malt vinegar are well known. Its pleasant and refreshing odour is chiefly derived from acetic acid and acetic ether. Its strength is distinguished by the makers as Nos. 18, 20, 22, and 24; the last of which, also called 'proof vinegar,' is the strongest, and usually contains about 4·6% of real or about 5% of glacial acetic acid. Its density varies according to the quantity of foreign matter which it contains. Sp. gr. 1·017 to 1·019—B. P. This vinegar usually contains a small quantity of sulphuric acid. The presence of 1-1000th part of this acid is allowed by law.

Pur. "Brownish; of a peculiar odour. Its sp. gr. is 1·019. 1 fl. oz. of the acid is saturated by 1 dr. of the crystals of carbonate of soda. If, after 10 minims of solution of chloride of barium have been added to the same quantity, more of the chloride be poured into the filtered acid, nothing further is thrown down. The colour is not changed by the addition of hydrosulphuric acid." (Ph. L.)

2. Wine vinegar, French v.; Acetum Gallicum (Ph. E. & D.), A. vini, L.; Vinaigre d'Orleans, Fr. This is prepared, in wine countries, from grape juice and inferior new wines, worked up with wine-lees, by a nearly similar process to that adopted for malt vinegar. That prepared from white wine (white-wine vinegar) is the most esteemed. It is purer and pleasanter than malt vinegar. Sp. gr. 1·014 to 1·022—Ph. E.; 1·016—Phillips. It usually contains from 5 to 6% of acetic acid. "100 parts of good Orleans vinegar should require 10 parts of dry carbonate of potassa for saturation." (Soubeiran.)

3. German, or quick-method of making vinegar; process of Ham. This method is based upon the fact, that acetification is the mere oxidation of alcohol in contact with organic matter. Hence, by employing dilute alcohol, or liquors containing it, and by vastly enlarging the surface of the liquid exposed to the air at a proper temperature, we may reduce the period occupied in acetification from weeks to as many hours. In practice this is effected by causing the dilute spirit, previously mixed with 1-1000th part of sugar or malt extract, or the fermented and clarified malt-wort, to slowly trickle down through a mass of beech shavings steeped in vinegar, and contained in a vessel called a vinegar generator (essigbilder), or graduation vessel. This is an oaken tub, narrower at the bottom than at the top, furnished with a loose lid or cover, below which is a perforated shelf (colander or false bottom), having a number of small holes, which are loosely filled with packthread about 6 inches long, and prevented from falling through by a knot at the upper end. The shelf is also perforated with four open glass tubes, as air-vents, each having its ends projecting above and below the shelf. This arrangement is repeated a second and a third time, or even oftener, according to the size of the vessel. The tub or graduator at its lower part is pierced with a horizontal row of eight equidistant round holes, to admit atmospheric air. One inch above the bottom is a syphon-formed discharge pipe, whose upper curvature stands one inch below the level of the air-holes in the side of the tub. The floors or partitions of the tub or generator being covered with birch twigs or beech chips to the depth of a few inches, the alcoholic liquor (first heated to between 75° and 83° Fahr.) is introduced at the upper part of the apparatus. This immediately commences trickling slowly down through the holes by means of the packthreads, diffuses itself over the chips or twigs forming the respective strata, slowly collects at the bottom of the tub, and then runs off by the syphon pipe. The air enters by the circumferential holes, circulates freely through the tub, and escapes by the glass tubes. As the acetification proceeds, the temperature of the liquid rises to 100° or 105° Fahr., and remains stationary at that point while the action goes on favorably. The alcoholic solution or wort requires to be passed three or four times through the cask before acetification is complete, which is, in general, effected in from 24 to 36 hours.

Obs. For the production of a superior vinegar by this process, it is necessary that the spirit employed be sufficiently pure not to contaminate the product with its flavour or odour, and that the malt-wort should be fermented and treated with all the care usually employed in the production of beer. The best English manufacturers who have adopted this process are in the habit of filtering or clarifying their fermented wash, and also of storing it away for several months before they subject it to acetification in the graduator. The most favorable temperature for the process is about 90° Fahr., and this should be preserved, as much as possible, by artificial means. *Prod.* A malt-wort of the sp. gr. 1·072, or, in "technical language, weighing about 26 lbs. per barrel, afforded a vinegar containing 5·4% of pure acetic acid, and a residuary extract of 10 lbs., from 36 galls. The former of these would indicate 35 lbs. of sugar, or 13·7 lbs. per barrel of gravity; whilst the latter shows 3·8 lbs. per barrel; the two united being only 17·5 lbs., instead of 26, the original weight. The loss, therefore, has been 8·5 lbs., or from a sp. gr. of 1·072 to less than 1·050." (Ure.) Thus, about one third of all the extractive matter of the malt is lost or dissipated during the processes of fermentation and acetification. According to Knapp, a mixture of about 80 galls. of water, 9 galls. of spirit of from 44 to 45% Tralles (18 or 20 u. p.), and 3 galls. of vinegar containing 3·5% of real acid, forming together 92 galls., yield, on an average, an almost equal quantity of vinegar, or about from 90 to 91 galls. of the above-stated strength.

4. Wood vinegar. See Pyroligneous Acid.

5. Other varieties of vinegar, of minor importance; chiefly domestic, and commonly 'worked' as malt vinegar.—Ale vinegar, alegar; acetum cerevisiæ. From strong pale ale which has soured.—Argol vinegar; acetum ex tartaro. From white argol or cream of tartar, 1 lb.; dissolved in boiling water, 2 galls.; with the addition, when cold, of proof spirit or whiskey, 3 pints.—Crystal vinegar. Pickling vinegar, discoloured with fresh burnt animal charcoal.—Cider vinegar. From cider, worked as malt vinegar.—German household vinegar. From soft water, 7½ galls.; honey or brown sugar, 2 lbs.; cream of tartar, 2 oz.; corn spirit or whiskey, 1 gall.—Gooseberry vinegar. From bruised gooseberries and brown sugar, of each 1¼ lb.; water, 1 gall. Other fruits may be substituted for gooseberries.—Pickling vinegar. The strongest pale malt

vinegar.—RAISIN VINEGAR. From the marc left from making raisin wine, 1 cwt. to every 12 or 15 galls. of water, along with a little yeast.—SUGAR VINEGAR. From brown sugar, 4 lbs. to each gallon of water.—WHISKEY VINEGAR. From whiskey, 1 pint; sugar, 2 oz.; yeast, a dessert-spoonful.

Pur., tests, & assay. These are, for the most part, rather fully noticed under ACETIC ACID, ACETIMETRY, and above. The following additional tests, &c., may, however, be useful:—1. Paper written on or smeared with pure vinegar is not charred when strongly warmed before the fire; if it is, the sample examined contained fully 2% of oil of vitriol.—2. A small porcelain capsule, or china cup, dipped into a solution of sugar in 30 times its weight of water, and then heated to a temperature equal to that of boiling water, is not materially discoloured when a drop of pure vinegar is poured on it; but a spot of an intensely brown or black colour is formed if the sample contain only 1-300th part of sulphuric acid; if it contains only 1-1000th part, the spot is olive green; and if a less quantity, then only of a pale green colour.—3. The heavy white precipitate given with chloride of barium (see *above*) shows the presence of sulphuric acid; each grain, after being dried, and gently ignited, represents ·344 grs. of dry sulphuric acid. If the precipitate from 1000 grs. of the vinegar exceeds 2½ grs., it contains an illegal quantity of this acid.—4. If a solution of nitrate of silver gives a cloudy white precipitate, hydrochloric acid is present.—5. If, after the addition of 2 or 3 grs. of carbonate of potash, and evaporation of the sample to dryness, the residuum deflagrates when ignited, the sample under examination contains nitric acid.—6. If the vinegar be blackened by sulphuretted hydrogen or hydrosulphuret of ammonia, it contains either lead or copper. If it gives a yellow precipitate with iodide of potassium or chromate of potash, the metal is lead. If ferrocyanide of potassium gives a bronze-brown coloured precipitate, or a little olive oil, when agitated with some of the vinegar, be turned green, the metal is copper.—7. If a small sample, gently evaporated to dryness, leaves more than 1% of residuum, and this has a sweet taste, it is undecomposed sugar. The presence of acrid substances, as capsicum, chillies, grains of paradise, mustard seed, pellitory of Spain, pepper, &c., may be detected by neutralising the acidity of the vinegar with carbonate of soda, when the acrid taste of the adulterant will be readily perceived.

Vinegar, Aromat′ic. *Syn.* ACETUM AROMATICUM, L. *Prep.* 1. Glacial acetic acid, 1 lb.; oil of cloves, 1½ dr.; oil of rosemary, 1 dr.; oils of bergamot, cinnamon, pimento, and lavender, of each, ½ dr.; neroli, 20 drops; camphor, 2½ oz.; rectified spirit, 2 fl. oz.; mix. Very fine.

2. (Henry's.) From glacial acetic acid, strongly scented with the oils of cloves, lavender, rosemary, and *Calamus aromaticus* to which the usual quantity of camphor is added. This is the formula adopted at Apothecaries' Hall.

3. (Extemporaneous.) From acetate of potash (dry), 1 dr.; oil of vitriol, 20 drops; oils of lemon and cloves, of each, 3 drops.

Obs. Aromatic vinegar is used as a pungent and refreshing perfume, in faintness, &c. For this purpose it is generally dropped on a small piece of sponge placed in a stoppered bottle or a vinaigrette. It is highly corrosive, and should therefore be kept from contact with the skin and clothes.

Vinegar, Camp. *Prep.* Take of sliced garlic, 8 oz.; Cayenne pepper, soy, and walnut ketchup, of each, 4 oz.; 36 chopped anchovies; vinegar, 1 gal.; powdered cochineal, ½ oz.; macerate for a month, strain, and bottle.

Vinegar, Cam′phorated.

Vinegar of Canthar′ides. *Syn.* BLISTERING VINEGAR; ACETUM CANTHARIDIS (B. P., Ph. L. E. & D.), L. *Prep.* 1. (Ph. L.) Cantharides, in powder, 2 oz.; acetic acid, 1 pint; macerate, with agitation, for 8 days, then press, and strain.

2. (Ph. E.) Cantharides, 3 oz.; euphorbium, ½ oz.; acetic acid, 5 fl. oz.; pyroligneous acid, 15 fl. oz.; macerate a week.

3. (Ph. D.) Spanish flies, 4 oz.; strong acetic acid, 4 fl. oz.; commercial acetic acid (sp. gr. 1·044), 16 fl. oz.; macerate, as before, for 14 days.

4. (B. P.) Cantharides, in powder, 2; glacial acetic acid, 2; acetic acid (28 per cent.), 18, or a sufficiency: add the glacial acetic acid to 13 of acetic acid, and in this mixture digest the cantharides for two hours at a temperature of 200° F.; when cold, place them in a percolator, and when the liquid ceases to drop, pour over the residuum the remaining 5 of acetic acid, and when the percolation is finished, press and make the whole liquid up to 20.

Uses, &c. As a counter-irritant, and to raise blisters. For the last purpose it is applied on a piece of lint, evaporation being prevented with a piece of oiled skin or thin sheet gutta percha. The last is the best, and, indeed, the only effective form; the others being too weak. "If the acetic acid be strong, a blister will be as rapidly raised without the cantharides as with them." (Dr. A. T. Thomson.)

Vinegar, Cur′rie. *Prep.* From currie powder, ½ lb.; vinegar, 1 gal.; infuse for a week. *Used* as a flavouring. Other like vinegars may be made in the same way.

Vinegar of Col′chicum. *Syn.* ACETUM COLCHICI (Ph. L. E. &. D.), L. *Prep.* 1. (Ph. L.) Dried corms of colchicum or meadow saffron, 3½ drs.; dilute acetic acid, 1 pint; macerate for 3 days, then press out the liquor, and, after defecation, add to the strained liquid, proof spirit, 1½ fl. oz.

2. (Ph. E.) Fresh colchicum bulbs (dried), 1

oz.; distilled vinegar, 16 fl. oz.; proof spirit, 1 fl. oz.

3. (Ph. D.) Dried colchicum bulbs, 1 oz.; acetic acid (1·044), 4 fl. oz.; distilled water, 12 fl. oz.; as before, but prolonging the maceration for 7 days.

Obs. Vinegar of colchicum is chiefly used in gout. *Dose.* 20 drops to 1 fl. dr. The Dublin preparation is about three times as strong as the others, and the dose must therefore be proportionately less

Vinegar, Distill'ed. *Syn.* ACETUM DESTILLATUM (Ph. L. & E., and Ph. D. 1826), L. *Prep.* 1. (Ph. L.) Vinegar, 1 gal.; distil in a sand bath, 7 pints. Sp. gr. 1·0065.

2. (Ph. E.) Vinegar (preferably French), 8 parts; distil over with a gentle heat, 7 parts; and dilute the product, if necessary, with distilled water, until the sp. gr. is 1·005.

Pur., &c. "1 fluid oz. is saturated by 57 grs. of crystallised carbonate of soda." (Ph. L.) 100 grs. are saturated by 13 grs. of crystallised carbonate of soda. It contains about 4·6% of real acetic acid. If a pewter worm is used, a portion of lead is dissolved, and the product becomes cloudy and poisonous. Distilled vinegar is more agreeable than pure dilute acetic acid of the same strength.

Vinegar, Marseilles. *Syn.* VINEGAR OF THE FOUR THIEVES, PROPHYLACTIC VINEGAR; ACETUM PROPHYLACTICUM, A. ANTISEPTICUM, A. THERIACALE, A. QUATUOR FURUM, L.; VINAIGRE DES QUATRE VOLEURS, Fr. *Prep.* Take of the summits of rosemary and flowers of sage (dried), of each, 4 oz.; dried lavender flowers, 2 oz.; cloves, 1 dr.; distilled vinegar, 1 gal.; digest for 7 days, press, and filter. *Used* as a corrector of bad smells, and formerly as a prophylactic against the plague, and other contagious diseases. It is said to have been a favourite preventive with Cardinal Wolsey, who always carried some with him. The original formula also contained, of garlic, ½ oz.; fresh rue, 1½ oz.; and camphor, dissolved in spirit, 1 oz.

Vinegar of O''pium. *Syn.* ACETUM OPII (Ph. E. & D.), L. *Prep.* 1. (Ph. E.) Opium, sliced, 4 oz.; distilled vinegar, 16 fl. oz.; macerate for 7 days, press, and filter.—*Dose.* 5 to 20 drops.

2. (Ph. D.) Opium, in coarse powder, 1½ oz.; dilute acetic acid, 1 pint; macerate for 7 days.—*Dose.* 10 or 12 to 60 drops.

Obs. These were intended to supersede the old 'black drop,' which they closely resemble in their action.

Vinegar, Rasp'berry. *Syn.* ACETUM RUBI IDÆI, L.; VINAIGRE FRAMBOISE, Fr. *Prep.* 1. Bruised ripe raspberries and white wine vinegar, of each, 3 pints; macerate for 3 days, press, strain, and to each pint add of white sugar, 1 lb.; boil, skim, cool, and at once bottle. Some persons add 2 fl. oz. of brandy to each pint.

2. (P. Cod.) Fresh raspberries, picked from their calices, 3 lbs.; (1 lb.—Ph. Bor.); good vinegar, 2 lbs.; macerate, in glass, for a fortnight, then strain, without pressure.

Obs. In a similar manner may be made cherry vinegar, strawberry v., and the vinegars of all other like fruits.

Vinegar of Squills. *Syn.* ACETUM SCILLÆ (Ph. L. E. & D.), ACETUM SCILLITICUM, L. *Prep.* 1. (Ph. L.) Take of squills, recently dried and bruised, 2½ oz.; dilute acetic acid, 1 pint; macerate with a gentle heat, in a covered vessel, for 3 days, then press out the liquor, and, after defecation, add to the strained liquid, proof spirit, 1½ fl. oz. The Edinburgh and Dublin Colleges direct cold maceration for 7 days in a glass vessel, and the Dublin omits the spirit.

2. (Wholesale.) From squills, 7 lbs.; distilled vinegar, 6 galls.; macerate in the cold for 10 days, press, and filter. Expectorant and diuretic.—*Dose.* ½ to 1½ fl. dr.; in chronic pulmonary affections, dropsies, &c.

Vinegars (Cul'inary). *Prep.* 1. BLACK PEPPER VINEGAR, CAPER V., CAPSICUM V., CELERY-SEED V., CHILLIE V., CRESS-SEED V., GARLIC V., GINGER V., HORSERADISH V., ONION V., RED-ROSE V., SEVILLE-ORANGE-PEEL V., SHALLOT V., TRUFFLE V., WHITE PEPPER V., with several others of a like kind, are made by steeping about an oz. of the respective articles in a pint of good vinegar for 14 days, and straining.

2. BASIL VINEGAR, BURNET V., CELERY V., CHERVILLE V., ELDER-FLOWER V., GREEN-MINT V., TARRAGON V., with several others from like substances, are prepared from 2 to 3 oz. of the leaves to each pint of vinegar; the whole being frequently shaken for 14 days, then strained and bottled. They are used in cookery. The culinary vinegars may also be prepared in the same manner as the 'culinary spirits' and 'tinctures,' by simply substituting strong pickling vinegar for the spirit.

Vinegars (Perfumed'). *Syn.* ACETA ODORIFERA, L. *Prep.* From the dried flowers, 1 to 2 oz., or the fresh flowers, 2 to 4 oz.; strongest distilled vinegar, 1 pint; digest for a week, strain with pressure, and repeat the process with fresh flowers, if necessary. They may also be made by adding 15 to 20 drops, or q. s., of the respective essential oils to the vinegar. In a similar way are prepared the vinegars of clove-gilly flowers, elder flowers, lavender f. (vinaigre distillé de lavande), musk roses, orange flowers (fresh), Provins roses, red roses (vinaigre de rose; acetum rosatum), rosemary flowers (vinaigre de rosmarin; acetum anthosatum), tarragon flowers, &c. &c. Another excellent plan is to add 1 fl. oz. of glacial acetic acid to each pint of the respective perfumed spirits. This answers admirably for acetic eau de Cologne and like perfumes.

VI'NOUS FERMENTA'TION. *Syn.* ALCOHOLIC FERMENTATION. The peculiar change by which sugar, in solution, is converted into carbonic acid, which is eliminated, and into alcohol, which remains in solution in the fermented liquor.

The presence of a 'ferment' is essential to excite the vinous fermentation, as a solution of absolutely pure sugar remains unaltered, even though exposed to the conditions most favourable to its accession. In the juices of the sweet fruits, and in those vegetable solutions that spontaneously run into a state of fermentation, the ferment is supplied by nature, and is intimately associated with the saccharine matter. In the juice of those grapes which produce the more perfect wines, the relative proportions of the exciters of fermentation and the sugar are so accurately apportioned, that the whole of the former are decomposed, and nearly the whole of the latter is converted into alcohol; so that the liquid (wine) is left in a state but little liable to future change. An infusion of malt, however, in which the nitrogenised matters (gluten, vegetable albumen, &c.) are absent, or at least present in too small quantities to vigorously excite the vinous fermentation, undergoes a mixed species of decomposition, with the formation of products widely different from those that result from the true vinous fermentation; or, in other words, the liquid becomes spoiled. But if a ferment (yeast) be added to this infusion of malt under the above circumstances, and in the proper proportion to the sugar present, the true vinous fermentation speedily commences, and the liquid becomes converted into beer. This is what actually takes place in the process of brewing, and the scientific brewer endeavours to employ a proper quantity of ferment to decompose the whole of the saccharine matter of his wort; but, at the same time, as equally endeavours to avoid the use of an excess.

The chief product of the vinous fermentation is alcohol, but there are other substances simultaneously produced, and which remain associated with the fermented liquor. Among the principal of these are œnanthic acid, œnanthic ether, fusel oil (oil of potato spirit, oil of grain), &c.; none of which exist previously to fermentation, and are generally supposed to result from the action of the nitrogenised matters of the solution on the sugar. Under certain circumstances these extraneous products are formed in much larger quantities than under others; and as these substances injure the value of the alcohol with which they are associated, a knowledge of the peculiar circumstances favourable and unfavourable to their production is a desideratum to the brewer and distiller.

According to MM. Colin and Thénard, Frémy, Rousseau, and others, the essential condition of a ferment, to be able to excite the pure vinous fermentation, is to be sufficiently acidulous to act on coloured test-paper; and this acidity should arise from the presence of certain vegetable acids and salts, capable of conversion into carbonic acid and carbonates by their spontaneous decomposition. Those acids and salts which are found to pre-exist in fermentable fruits and liquors, as the tartaric, citric, malic, and lactic acids, and their salts, should be chosen for this purpose; preference being given to the bitartrate of potassa, on account of its presence in the grape. The addition of any of these substances to a saccharine solution renders its fermentation both more active and complete. The favourable influence of cream of tartar on fermentation was first pointed out by Thénard and Colin, and the addition of a little of this article has been adopted in practice, with manifest advantage, by the manufacturers of British wine.

There is good reason for supposing that each variety of sugar which is susceptible of the alcoholic fermentation is first converted into grape sugar, by contact with the ferment, and that this variety of sugar is alone capable of yielding carbonic acid and alcohol.

The circumstances most favourable to this fermentation are, a certain degree of warmth—a sufficient quantity of active ferment, and its due distribution through the liquor. The temperature of from 68° to 77° Fahr., is usually regarded as the most propitious for the commencement and progress of fermentation; but it has been ably shown by Liebig that, at this temperature, the newly formed alcohol slowly undergoes the 'acetous fermentation,' forming vinegar, by which the vinous character of the liquor is lessened. This conversion of alcohol into vinegar proceeds most rapidly at a temperature of 95° Fahr., and gradually becomes more languid, until, at about 46° to 50° Fahr. (8 to 10 Cent.), it ceases altogether, while the tendency of the nitrogenous substances to absorb oxygen at this low temperature is scarcely diminished in a perceptible degree. "It is therefore evident that if wort (or any other saccharine solution) is fermented in wide, open, shallow vessels, as is done in Bavaria, which afford free and unlimited access to the atmospheric oxygen, and this in a situation where the temperature does not exceed 46° to 50° Fahr., a separation of the nitrogenous constituents, *i. e.* the exciters of acidification, takes place simultaneously on the surface, and within the whole body of the liquid." (Liebig.) By this method wine or beer is obtained, which is invariably far superior in quality to that fermented in the usual manner. See FERMENTATION.

The symptoms of a perfect fermentation of malt wort, according to the usual English system with top yeast (*oberhefe*), have been thus described by a well-known practical writer on brewing: 1. A cream-like substance forms round the edges of the gyle tun, which gradually extends itself, and ultimately covers the whole surface of the liquor.—2. A fine curly or cauliflower head in a similar way extends itself over the surface, and indicates to the experienced brewer the probable quality of the fermentation.—3. The 'stomach,' or vinous odour, is next evolved, and continues to increase with the attenuation of the wort.

The peculiar nature of this odour is also an indication of the state of the fermentation.—4. The cauliflower head changes, or rises to a fine 'rocky' or 'yeasty' head, and ultimately falls down.—5. In this stage the head assumes a peculiar yeasty appearance, called by brewers 'close-yeasty,' and the gas is evolved in sufficient quantity to blow up little bells or bubbles, which immediately burst, and are followed by others, at intervals depending on the activity and forwardness of the fermentation. These bells should be bright and clear; as, if they appear opaque or dirty, there is something the matter with the wort. (Black.)

It is often of the utmost importance to brewers, wine-merchants, sugar-refiners, druggists, &c., to be able to lessen the activity of the vinous fermentation, or to stop it altogether, or to prevent its accession to syrups and other saccharine and vegetable solutions. Whatever will still the motion of the molecules of the nitrogenous matter forming the ferment will render them inoperative as exciters of fermentation. Among the simplest means of effecting this object, and such as admit of easy practical application, may be mentioned exposure to either cold or heat. At a temperature below about 50° Fahr., the acetous fermentation is suspended, and the alcoholic fermentation proceeds with diminished activity as the temperature falls, until at about 38° Fahr. it ceases altogether. In like manner, the rapid increase of the temperature of a fermenting liquid arrests its fermentation, and is preferable to the action of cold, as it is of easier application, and perfectly precipitates the ferment in an inert state. For this purpose, a heat of about 180° Fahr. is sufficient; but even that of boiling water may be employed with advantage. In practice, fluids are commonly raised to their boiling-point for this purpose, or they are submitted to the heat of a water bath (207½° Fahr.). In this way the fermentation of syrups and vegetable solutions and juices is commonly arrested in the pharmaceutical laboratory.

Among substances that may be added to liquids to arrest fermentation, the most active are—the volatile oil of mustard, coarsely powdered mustard seed or pure flour of mustard, sulphurous acid or the fumes of burning sulphur, sulphuric acid, sulphite of lime, tincture of catechu, strong spirit, strong acetic acid, chlorate of potassa, sugar of milk, bruised horse-radish, garlic, and cloves, and their essential oils, and all the other volatile oils that contain sulphur, and most of the salts that readily part with their oxygen. These substances arrest fermentation by rendering the yeast inoperative, and they possess this power nearly in the order in which they stand above. In practice, mustard, the fumes of burning sulphur, sulphite of lime, and chlorate of potassa, are those most adapted for beer, cider, wines, syrups, &c.; but some of the others are occasionally used, though less active. For arresting or preventing the fermentation of the vegetable juices and solutions, and the medicated syrups employed in pharmacy, mustard seed, either alone or combined with a little bruised cloves, may be safely used, as the addition of acids or salts would lead to the decomposition of their active principles. For this reason such liquids should be kept in a sufficiently low temperature to prevent fermentation; and should they pass into that state, it should be preferably arrested by the application of heat or cold, as above explained. Sugar of milk is also very effective for certain syrups, if not all of them.

To prevent, or rather to lessen, the production of fusel oil, it has been proposed to add a certain quantity of tartaric acid or bitartrate of potassa to the wort; or, to arrest the fermentative process somewhat before the liquid has reached its utmost degree of attenuation. The best means of depriving the spirit of this and other substances of a similar nature is to largely dilute it with water, and to redistil it at a gentle heat. Agitation with olive oil, decantation, dilution with a large quantity of water, and redistillation, have also been recommended. An excellent method is filtration through newly burnt and coarsely powdered charcoal. This plan succeeds perfectly with moderately diluted spirit. On the Continent, the addition of about 10% of common vinegar, and a very little sulphuric acid, followed by agitation, repose for a few days, and redistillation, is a favourite method. A solution of chloride of lime is also employed for the same purpose, and in the same way. In both these cases a species of ether is formed, which possesses a very agreeable odour. In the first, acetate of oxide of amyl (essence of jargonelle) is produced; and in the other, chloride of amyl, which also possesses a pleasant ethereal smell and taste. The affinity of the hydrated oxide of amyl (fusel-oil) for acetic acid is so great, that they readily unite without the intervention of a mineral acid. (Doebereiner.) Thus, the oil of vitriol mentioned above, though always used in practice, might be omitted without any disadvantage.

According to Messrs. Bowerbank, the distillers, quoted by Dr. Pereira, 500 galls. of corn spirit yield about one gal. of corn-spirit oil. See Acetification, Alcohol, Brewing, Distillation, Fermentation, Fusel Oil, Spirit, Vinegar, Viscous Fermentation, Yeast, &c.

VI'OLET. *Syn.* Purple violet, Sweet v.; Viola (Ph. L. & E.), L. "The recent petals of *Viola odorata*, Linn." (Ph. L.) It is chiefly used on account of its colour. See Syrup.

VIOLET DYE. Violet, like purple, is produced by a mixture of red and blue colouring matter, applied either together or in succession. The 'aniline colours' are now almost exclusively used for obtaining violet on silk and wool (see Aniline Purple & Tar Colours). With the old dye-stuffs, violet may thus be obtained:—A good violet may be given to silk or wool by passing it first through a solution of verdigris, then through a decoction of logwood, and, lastly, through alum water. A fast violet may be given by first dyeing the goods a crimson with cochineal, without alum or tartar, and, after rinsing, passing them through the indigo vat.—Linens and cottons are first galled with about 18% of gall-nuts, next passed through a mixed mordant of alum, iron liquor, and sulphate of copper, working them well, then through a madder bath made with an equal weight of root, and, lastly, brightened with soap or soda. Another good method is to pass cloth, previously dyed Turkey red, through the blue vat. Wool, silk, cotton, or linen, mordanted with alum and dyed in a logwood bath, or a mixed bath of archil and Brazil, takes a pretty, but false, violet.

VIS'COUS FERMENTATION. *Syn.* Mucilaginous fermentation, Mucous f. The peculiar change by which sugar, in solution, is converted into gummy matters, and other products, instead of into alcohol.

When the expressed juice of the beet is exposed to a temperature of 90° to 100° Fahr., for a considerable time, the sugar it contains suffers this peculiar kind of fermentation. Gases are evolved which are rich in hydrogen, instead of being exclusively carbonic acid, and when the sugar has, for the most part, disappeared, mere traces of alcohol are found in the liquid, but, in place of that substance, a quantity of lactic acid, mannite, and a mucilaginous substance, resembling gum arabic, and said to be identical with gum in composition. By boiling yeast or the gluten of wheat in water, dissolving sugar in the filtered solution, and exposing it to a tolerably high temperature, the viscous fermentation is set up, and a large quantity of the gummy principle generated, along with a ferment of a globular texture, like that of yeast, but which is capable of producing only the viscous fermentation in saccharine solutions.

The peculiar cloudy, stringy, oily appearance of wine and beer, called by the French 'graisse,' and the English 'ropiness,' depends on the accession of the viscous fermentation. The mineral acids and astringent substances, especially the sulphuric and sulphurous acids, and tannin, precipitate the viscous ferment, and are, hence, the best cures for this malady of fermented liquors. It is the large amount of tannic acid in the red wines and well-hopped beer which is the cause of their never being attacked with 'graisse,' or 'ropiness.' See Vinous Fermentation, Wines, &c.

VI''SION. The following means of preserving and restoring the sight may be appropriately inserted here:—

For near-sightedness.—Close the eyes and press the fingers very gently, from the nose outward, across the eyes. This flattens the pupil, and thus lengthens or extends the angle of vision. This should be done several times a day, or at least always after washing the face, until short-sightedness is overcome.

For loss of sight by age, such as require magnifying glasses, pass the fingers or towel from the outer corner of the eyes inwardly, above and below the eyeballs, pressing very gently against them. This rounds them up, and preserves or restores the sight.

It is said that many persons, by this last means, have preserved their sight so as to read fine print at 80 years of age; others, whose sight had been impaired by age, by carefully manipulating the eyes with their fingers, from their external angles inwardly, have restored their sight, and been able to dispense with glasses, and have since preserved it by a continuance of the practice. To be successful, or safe, these practices must be applied with great gentleness and caution. Many persons seriously damage their eyes by forcibly rubbing them when drowsy, especially on awaking in the morning.

The 'Lancet' remarks, that "there is good reason to believe that chicory (the coffee of the Londoners), from its narcotic character, exerts an injurious effect on the nervous system. So convinced of this is Professor Beer, of Vienna, a most celebrated German oculist, that he has enumerated chicoried coffee among the causes of amaurotic blindness."

To strengthen the eyes, to relieve them when swollen or congested, and to remove chronic ophthalmia, purulent discharges, &c., nothing is equal to frequently bathing them with water, at first tepid, but afterwards lowered in temperature to absolute coldness.

VIT'RIOL. A common name for sulphuric acid and for several of its salts. (See *below*.)

Vitriol, Blue. *Syn.* Roman vitriol. Commercial sulphate of copper.

Vitriol, Green. Commercial sulphate of iron.

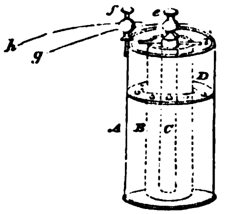
Vitriol, White. Commercial sulphate of zinc.

VITTIE VAYR. *Syn.* Vetiver. The Tamool name of the odorous and fibrous roots of the *Andropogon muricatus* sold by the perfumers.

VOLTA'IC ELECTRICITY. *Syn.* Galvanic e., Galvanism, Voltaism. That branch of electrical science which has reference to the phenomena attendant on the development of electricity by chemical action. Electricity thus developed may be made to show itself in the 'static' condition, so as to produce the effects of frictional electricity, but it is much more easily obtained in the 'dynamic' condition—in other words, as a 'voltaic current'—when it is especially remarkable for its chemical and magnetic effects. If a plate of zinc and a plate of platinum be immersed in dilute sulphuric acid, and connected outside the liquid by a wire, a current of electricity will immediately be set up, and will continue as long as the conducting circuit is complete and the action of the acid on the zinc goes on. The current of 'positive' electricity passes from the zinc, through the liquid, to the platinum, and thence through the wire to the zinc. The arrangement of two dissimilar metals immersed in a liquid which acts upon one of them is called a voltaic couple. By uniting a number of couples together in regular order, a voltaic pile or battery is formed.

The older forms of the voltaic battery, viz., **Volta's pile**, **Cruikshank's trough**, and **Wollaston's battery**, are now but little used. They all consist of a series of couples of zinc and copper, excited by an acid liquid, generally a mixture of water with $\frac{1}{40}$ of its bulk of sulphuric acid, and $\frac{1}{60}$ of nitric acid.

One of the most useful forms of the voltaic battery is that proposed by the late Prof. Daniell, and commonly known by his name. Its peculiar advantages arise from its action continuing without interruption for a long time, hence the name of 'constant battery' that has been applied to it. The following figure will explain the construction of each couple.



A. A copper cylinder, filled with a saturated solution of sulphate of copper.

B. A smaller porous cylinder (earthenware or membrane), containing a mixture of 1 measure of strong sulphuric acid, and about 8 measures of water.

C. A rod of amalgamated zinc, supported in the smaller cylinder by the cross piece (i).

D. A shelf full of small holes, for supporting crystals of sulphate of copper, to keep up the strength of the solution.

e and *f*. Screws and cups to connect the wires *g* and *h* with the battery.

g. The negative wire, connected with the zinc.

h. The positive wire, connected with the copper.

One of these couples is sufficient for electrotyping; six of them form a circle of considerable power, and about 20 produce one sufficiently strong for most experiments of demonstration and research.

In arranging these, as well as other batteries, when intensity, or travelling power, is desired, the metallic communication is made between the opposite metals (the zinc of one couple being united with the copper of another); but when simple quantity without intensity is required, the zinc of one battery is united with the zinc of the other, and the copper of the one with the copper of the other, an effect which is equally attainable with a single battery of enlarged dimensions.

Another useful apparatus is **Grove's battery**, in which the positive metal consists of amalgamated zinc immersed in sulphuric acid, diluted with 10 times its bulk of water; and the negative metal of platinum immersed in strong nitric acid. The two liquids are kept separate by the use of porous vessels, as in 'Daniell's battery.' This is an extremely powerful arrangement, but not so constant as Daniell's, owing to the reduction of the nitric acid to lower oxides of nitrogen. After this battery has been in action for about an hour, copious red nitrous fumes are given off, which cause great annoyance.

In place of platinum, compact charcoal or coke, prepared by a rather troublesome process, may be used, and the arrangement then constitutes a **Bunsen's battery**. Other substitutes for the costly platinum have been proposed, as lead coated with gold or platinum, and iron rendered 'passive' by immersion in strong nitric acid. Callan has obtained very good results with amalgamated zinc and cast iron immersed in diluted sulphuric acid, without the use of nitric acid (**Maynooth battery**).

In **Smee's battery**, which is much used in the arts, pairs of amalgamated zinc and platinised silver (or platinised platinum) are immersed in dilute sulphuric acid (1 part acid to 7 parts water). The plates of zinc are usually bent double, and the platinised plates interposed between the two surfaces formed by the bend. See **Platinizing** (*page* 1099).

In every voltaic combination the passage of the electricity (*i. e.* the positive modification of the force) in the liquid is from the active element to the inactive element; in the case of a simple zinc-and-copper couple, for instance, it is from the zinc to the copper. If this simple fact be borne in mind, it will decide in every case the question which confuses so many, namely, which is the positive, and which the negative end of a battery? The positive is the end where the electricity leaves the battery; the negative where it re-enters it. For further information connected with the subject of voltaic electricity, see articles on **Electricity**, **Electrolysis**, **Electrotype**, **Etching**, &c.

VOLUMETRIC ANALYSIS. Quantitative chemical analysis by measure. This method of analysis "consists in submitting the substance to be estimated to certain characteristic reactions, employing for such reactions liquids of known strength, and from the quantity of the liquid employed determining the weight of the substance to be estimated by means of the known laws of equivalence." As an example of this method we give the following from the Introduction in Mr. Sutton's excellent 'Handbook of Volumetric Analysis:'—"Suppose that it is desirable to know the quantity of pure silver contained in a shilling. The coin is first dissolved in nitric acid, by which means a bluish solution, containing silver, copper, and probably other metals, is obtained. It is a known fact that chlorine combines with silver in the presence of other metals to form chloride of silver, which is insoluble in nitric acid. The proportions in which the combination takes place are 35·46 of chlorine to every 108 of silver; consequently, if a standard solution of pure chloride of sodium is prepared by dissolving 58·46 grains of the salt (*i. e.* 1 equiv. sodium = 23, 1 eq. chlorine = 35·46 = 1 eq. chloride of sodium 58·46) in so much distilled water as will make up exactly 1000 grains by measure; every single grain of this solution will combine with ·108 grain of pure silver to form chloride of silver, which precipitates to the bottom of the vessel in which the mixture is made. In the process of adding the salt solution to the silver, drop by drop, a point is at last reached when the precipitate ceases to form. Here the process must stop. On looking carefully at the graduated vessel from which the standard solution has been used, the operator sees at once the number of grains which have been necessary to produce the complete decomposition. For example, suppose the quantity used was 520 grains; all that is necessary to be done is to multiply ·108 grain by 520, which shows the amount of pure silver present to be 56·16 grains." The volumetric method is much less troublesome than the ordinary method of analysis (by separating the constituents of a mixture and weighing them), and is admirably adapted for the examination of substances used in arts and manufactures. Most of the processes described under ACIDIMETRY and ALKALIMETRY are examples of this method. See those articles, also EQUIVALENTS, TEST-SOLUTIONS, &c.

WADE'S DROPS. Compound tincture of benzoin.

WA'FER PAPER. See WAFERS, in Cookery (*below*).

WA'FERS. Thin adhesive discs, used for securing letters or sticking papers together.

Prep. 1. (WAFERS, FLOUR W.) The finest wheaten flour is mixed with water, either pure or coloured, to a smooth pap or batter, which, after being passed through a sieve, to remove clots or lumps, is poured into the 'wafer-irons' (previously warmed and greased with butter or olive oil), and in this state exposed to the heat of a clear charcoal fire; the whole is then allowed to cool, when the irons are opened, and the thin cake, which has become hard and brittle, is cut into wafers by means of sharp annular steel punches, made exclusively for the purpose.

2. (GELATINE WAFERS, TRANSPARENT W.) Good gelatine or glue is dissolved, by the heat of a water bath, in just sufficient water to form a consistent mass on cooling; it is then poured, whilst hot, upon the surface of a warm plate or mirror glass, slightly oiled, and surrounded with a border of card paper (laid flat); a similar plate, also warmed and oiled, is next laid upon the gelatine, and the two plates pressed into as close contact as is permitted by the card paper; when quite cold, the thin sheet of gelatine is removed, and cut into wafers with punches, as before. 1 to 2 oz. of sugar is commonly added to each lb. of gelatine.

3. (MEDALLION WAFERS.) A sheet of metal or glass, having designs sunk in it corresponding to the raised part of seals, being provided, the hollows are filled up with a mixture formed of any appropriate coloured powder, made into a paste with gum water or size, leaving the flat part clear; melted coloured glue is then poured on the plate, and the process is otherwise conducted as before. For use, the paper is wetted where the wafer is to be applied.

Obs. Care must be taken that no poisonous colours be employed. For gelatine wafers, transparent colours only can be used. Those noticed under LIQUEURS and STAINS (Confectioner's) are appropriate. To these may be added plumbago, sesquioxide of iron (crocus martis), smalts, levigated vegetable charcoal, and vermilion.

Wafers. (In cookery.) *Prep.* Make fine flour, dried and sifted, into a smooth thin batter with good milk, or a little cream-and-water; add about as much white wine as will make it thick enough for pancakes, sweeten it with a little loaf sugar, and flavour it with powdered cinnamon. When thus prepared, have the wafer-irons made ready, by being heated over a charcoal fire; rub them with a piece of linen cloth dipped in butter; then pour a spoonful of the batter upon them, and close them almost immediately; turn them upon the fire, and pare the edges with a knife, if any of the batter oozes out. A short time will bake them, when the irons are perfectly heated. The wafers must be curled round whilst warm when they are for ornaments. 'Wafer paper' is prepared in a similar way to the above; but when intended to be kept for some time, the milk must be omitted. *Used* by cooks, &c.; and, recently, as an envelope for nauseous medicines.

Wafers, Da Silva's. These nostrums were introduced to the public some time ago, as though they were prepared from the formulæ of a celebrated physician whose name was affixed to them.[1] There are three varieties, which are said to be prepared as follows:—

1. APERIENT OR ANTIBILIOUS WAFERS. From sugar and extract of liquorice (Spanish juice), equal parts; senna and jalap, of each, in fine powder, about ½ dr. to every oz. of sugar employed; made into a mass with a concentrated infusion of senna, and divided into 12-gr. lozenges or squares with the corners rounded off.

2. FEMALE WAFERS. From sugar, horehound candy (or honey), and aperient wafer mass, equal parts; beaten to a proper consistence with weak gum water, to which a little orange-flower water has been added, and divided into 8 gr. tabellæ, as before.

3. PULMONIC WAFERS. From lump sugar and starch, of each, in powder, 2 parts; powdered gum, 1 part; made into a lozenge-mass

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[1] For an exposition of the Da Silva quackery, with Dr. Locock's letter on the subject, see the 'Anat. of Quackery,' or the 'Med. Cir.," ii, 106-126.

with vinegar of squills, oxymel of squills, and ipecacuanha wine, equal parts, gently evaporated to 1-6th their weight, with the addition of lactucarium in the proportion of 20 to 30 grs. to every oz. of the dry powders; the mass being divided into half-inch squares, weighing about 7½ grs. each (when dry), as before.

WAL'NUT. The *Juglans regia*, a tree of the natural order *Juglandaceæ*. The sap yields sugar; the fruit is the walnut; the kernels of the latter are eaten and pressed for their oil; the peel or husks are used for 'rooting' or dyeing brown; the unripe fruit is pickled, and its juice is used as a hair dye; the leaves are reputed diaphoretic and antisyphilitic; and the wood is esteemed for cabinet work.

WARBURG'S FEVER DROPS. See Warburg's Fever Tincture.

WARD'S RED DROP. A strong solution of emetic tartar in wine.

WARTS. *Syn.* Verrucæ, L. These chiefly attack the hands, and may be removed by the daily use of a little nitrate of silver, nitric acid, or aromatic vinegar, as directed under Corn. The first of the above applications produces a black stain, and the second a yellow one; both of which, however, wear off after the lapse of some days. Acetic acid scarcely discolours the skin. Erasmus Wilson, the eminent surgeon and talented author of several works on the skin, mentions the case of a gentleman who removed an entire crop of warts from his knuckles and fingers by subjecting them to a succession of sparks from one of the poles of an electrical machine. "He was in the habit, as is usual, of trying the amount of electric fluid collected in his machine by placing his knuckle near the brass knob, and receiving a spark. Observing that an odd sensation was produced whenever the spark struck a wart, he was tempted for amusement to give them a round of discharges. When his attention was next directed to his hands, he found, to his surprise and satisfaction, that all the warts had disappeared." Dr. Peez, of Wiesbaden, recommends the internal use of carbonate of magnesia in cases of warts.

The papular eruption which covers the hands of some persons, and which is occasionally called 'soft warts,' is best removed by the daily use of Gowlard's lotion.

WASH. The fermented wort of the distiller.

WASH-BALLS. See Savonettes.

WASHERWOMAN'S SCALL. See Psoriasis.

WASHES. The familiar name of lotions, more especially of those employed as cosmetics. See Freckles, Lotion, Milk of Roses, Skin Cosmetics, &c., and *below*.

Washes, Hair. *Prep.* 1. From rosemary tops, 2 oz.; boiling water, 1 pint; infused together in a teapot or jug, either with or without the addition of rectified spirit, 1 fl. oz. (or rum, 2 fl. oz.) to the cold strained liquor.

2. Box leaves, a small handful; boiling water, 1 pint; digest for an hour, simmer 10 minutes, and strain. Both are used to improve the growth of and strengthen the hair.

3. To clean the 'partings,' remove scurf, &c.—*a.* (Antipityrienne.) From sesquicarbonate of ammonia, 1 oz.; spirit of rosemary, ½ pint; rose of elder-flower water, 1½ pint.

b. (Detergent essence.) From honey, 2 oz.; borax, 1 oz.; cochineal (bruised), ½ oz.; camphor, 1 dr.; (dissolved in) rectified spirit, 2 fl. oz.; soft water, ¾ pint; oil of rosemary, 20 drops.

c. (Vegetable extract.) Take of salt of tartar, 1 oz.; rosemary water, 1 pint; burnt sugar, q. s. to tinge it brown; dissolve, filter, and add of essence of musk, 10 drops.

4. To darken the hair.—*a.* From pyrogallic acid, ½ oz.; distilled water, orange-flower water, and rectified spirit, of each, 1½ fl. oz.

b. (La Forest's cosmetic lotion or liquid hair dye.) Boil, for a few minutes, chloride of sodium, 1 dr., and sulphate of iron, 2 drs., in red wine, 1 lb.; then add of verdigris, 1 dr.; in 2 or 3 minutes remove it from the fire, and further add of powdered galls, 2 drs.; the next day filter. For use, moisten the hair with the liquid; in a few minutes dry it with a cloth, and afterwards wash the skin with water.

5. To prevent the hair falling off.—*a.* (American shampoo liquid.) Take of carbonate of ammonia, ½ oz.; carbonate of potash, 1 oz.; water, 1 pint; dissolve, and add the solution to a mixture of tincture of cantharides, 5 fl. oz.; rectified spirit, 1 pint; good rum, 3 quarts. *Used* to strengthen the hair and to remove dandruff, by moistening it with the mixture, rubbing, so as to form a lather, and then washing with cold water.

b. (Balm of Columbia.) As the last, omitting the potash, quadrupling the carbonate of ammonia, and adding some perfume.

c. (Eras. Wilson.) Eau de Cologne (strongest), 8 fl. oz.; tincture of cantharides, 1 fl. oz.; oils of rosemary and lavender, of each, ½ fl. dr.

d. (Dr. Locock's lotion.) From expressed oil of mace (nutmeg), 1 oz., liquefied, at a gentle heat, with olive oil, ½ oz.; and, when cold, formed into an emulsion by agitation with rose water, ½ pint; spirit of rosemary, 2½ fl. oz.; stronger liquor of ammonia, 1½ fl. drs. For other formulæ, see Baldness, Hair dyes, Lotion, &c.

Washes, Medicinal. See Lotion, &c.

Washes, Mouth. *Syn.* Tooth washes; Collutoria, L. *Prep.* 1. Take of camphor (cut small), ½ oz.; rectified spirit, 2 fl. oz.; dissolve. A few drops to be added to a wineglassful of water, to sweeten the breath and preserve the teeth.

2. Chloride of lime, ½ oz.; water, 2 fl. oz.; agitate well together in a phial for ½ an hour, filter, and add, of rectified spirit, 2 fl. oz.; rose or orange-flower water, 1 fl. oz. *Used*, highly diluted with water, as the last, by smokers and persons having a foul breath.

3. Mastic (in powder), 2 drs.; balsam of Peru, ½ dr.; gum, 2 drs., or q. s.; orange-flower water, 6 fl. oz.; tincture of myrrh, 2 fl. drs.; for an emulsion. In loose teeth, &c.

4. Tannin, ½ dr.; tincture of tolu, 2 fl. dr.s; tincture of myrrh, 6 fl. drs.; spirit of horseradish, 2 fl. oz.; mix. In spongy gums, scurvy, &c.; diluted with tepid water.

5. (Swediaur.) Borax, ½ oz.; water and tincture of myrrh, of each, 1 fl. oz.; honey of roses, 2 oz. In tender or ulcerated gums.

6. Balsam of Peru, 2 drs.; camphor, ½ dr.; essence of musk and liquor of ammonia, of each, ½ fl. dr.; tincture of myrrh, 3 fl. drs.; spirit of horseradish, 1½ fl. oz. To sweeten and perfume the breath; a teaspoonful in ½ wineglassful of tepid water to rinse the mouth with.

Washes, Tooth. See *above*.

WASHING FLU'IDS. Solutions of carbonate of soda, rendered caustic with quicklime.

WASHING POW'DERS. See POWDERS.

WATCH'FULNESS. *Syn.* SLEEPLESSNESS; AGRYPNIA, L. The common causes of watchfulness are thoughtfulness or grief, disordered stomach or bowels, heavy and late suppers, and a deficiency of out-door exercise. The best treatment, in ordinary cases, simply consists in an attention to these points. The method of producing sleep recommended by a late celebrated hypnotist consists in merely adopting an easy recumbent position, inclining the head toward the chest, shutting the eyes, and taking several deep inspirations with the mouth closed. Another method, recommended by an eminent surgeon, and which appears infallible if persevered in with proper confidence, and which is suitable either to the sitting or recumbent posture, consists in tying a decanter cork with a bright metallic top, a pencil-case, or any other bright object on the forehead, in such a position that the eyes must be distorted or strained to be capable of seeing it. By resolutely gazing in this way for a short time, without winking, with the mind fully absorbed in the effort, the muscles of the eyes gradually relax, and the experimenter falls asleep. Gazing in a similar manner on any imaginary bright spot in the dark, as at night, exerts a like effect. A tumblerful of cold spring water, either with or without a few grains of bicarbonate of potash in it, taken just before lying down, will frequently succeed with the dyspeptic and nervous, when all other means fail. See SUPPER, &c.

WA'TER. H_2O. *Syn.* OXIDE OF HYDROGEN, PROTOXIDE OF H.; AQUA, L.; EAU, Fr.; WASSER, Ger. The ancients regarded water as a simple substance, and as convertible into various mineral and organic products. Earth, air, fire, and water, were at one time conceived to be the elementary principles or essences of matter, from which all form and substance derived their existence. The true constitution of water was not discovered until about the year 1781, when Cavendish and James Watt, independently and nearly simultaneously, showed it to be a compound of hydrogen and oxygen. Five years, however, before this time (1776), the celebrated Macquer, assisted by Sigaud de la Fond, obtained pure water by the combustion of hydrogen in the air. It has since been satisfactorily demonstrated that hydrogen and oxygen exist in water in the proportion of 1 to 8 by weight, or 2 to 1 by volume; the sp. gr. of hydrogen being to that of oxygen as 1 to 16. One cubic inch of perfectly pure water at 62° Fahr., and 30 inches of the barometer, weighs 252·458 grs.; by which it will be seen that it is 815 times heavier than atmospheric air. Its sp. gr. is 1·0, it being made the standard by which the densities of all solid and liquid bodies are estimated. The sp. gr. of frozen water (ice) is ·9175 water being 1·0 (Dufour); that of aqueous vapour (steam), ·6252, air being 1·0. Water changes its volume with the temperature; its greatest density is at about 39½° Fahr., and its sp. gr. decreases from that point either way. By the enormous pressure of 30,000 lbs. on the square inch, 14 volumes of water are condensed into 13 volumes. Water evaporates, at all temperatures, but at 212°, under ordinary circumstances, this takes place so rapidly that it boils, and is converted into vapour (steam), whose bulk is nearly 1700 times greater than that of water. The general properties and uses of water are too well known to require notice.

Var. Of these the following are the principal:—

DISTILLED WATER; AQUA DESTILLATA (B. P., Ph. L. E. & D.), L. Obtained by the distillation of common water through a block-tin worm, rejecting the first and last portions that come over. The still employed for this operation should be used for no other purpose; and when great nicety is required the distillation should be performed in glass or earthenware. It remains limpid on the addition of lime water, chloride of barium, nitrate of silver, oxalate of ammonium, or hydrosulphuric acid. It is the only kind of water that should be employed in chemical and pharmaceutical operations. When distilled water is not at hand, clean filtered or clarified rain water is the only kind that can be successfully substituted.

RAIN WATER; AQUA PLUVIA, L. A nearly pure kind of natural water; but it contains minute quantities of air, carbonic and nitric acid, carbonate of ammonium, &c.

SNOW WATER; AQUA NIVALIS, L. The purest of all natural waters.

SPRING WATER; AQUA (Ph. E.), AQUA FONTANA (Ph. D.), L. Rain water which has percolated through the earth almost always contains mineral impurities. For pharmaceutical use, spring water must be so far free of saline matter as not to possess the quality of hardness, or contain above 1·6000th part of solid matter. (Ph. E.)

River water; Aqua fluvialis, L. Less pure than good spring water. Thames water contains about 1·3500th part of fixed impurities, chiefly carbonate of calcium; or from 16 to 24 grs. of solid matter per gallon, indepedently of gaseous matter and mechanical impurities.

Well water, Pump water; Aqua puteana, L. Less pure than either of the preceding. Usually contains a large quantity of carbonate and sulphate of calcium. Hence its 'hardness' and property of curdling soap. When this arises from the first-named substance, it is called, temporary hardness,' since it is, for the most part, removed by boiling and exposure; but when it arises from sulphate of calcium, it is called 'permanent hardness,' since it cannot be so easily remedied.

Sea water; Aqua marina, L. The characteristic of this variety is its saltness. Its density is about 1·0274, and the average quantity of saline matter which it contains is about 3½ per cent., of which about $\frac{27}{35}$ are chloride of sodium, and the remainder chiefly chloride of magnesium and sulphate of magnesium.

Analysis of Sea Water (British Channel), by Dr. Schweitzer, of Brighton:

1000 *grains contained*—	*grains.*
Water	964·745
Chloride of sodium	27·059
„ of potassium	0·766
„ of magnesium	3·666
Bromide of magnesium	0·029
Sulphate of magnesium	2·296
„ of calcium	1·406
Carbonate of calcium	0·033
	1000

Pur. Pure water is perfectly transparent, odourless, and colourless, and evaporates without residue, or even leaving a stain behind. The purest natural water is that obtained by melting snow or frozen rain, that has fallen at some distance from any town. Absolutely pure water can only be obtained by the union of its gaseous constituents; but very pure water, sufficiently so for all purposes, may be procured by the careful distillation of common water.

Tests. 1. If a precipitate is formed, or a 'fur' or 'crust' deposited on the vessel during ebullition, it indicates the presence of carbonate of calcium.—2. The residuum, if any, of evaporation, is impurity; if it be organic matter, smoke and a peculiar odour will be evolved, as the residue becomes dry and charred.—3. If a solution of ferrous sulphate, when added to the water contained in a stoppered phial, occasions a reddish-brown precipitate after a few days, the presence of oxygen is indicated.—4. Neither litmus, syrup of violets, nor turmeric, are discoloured or affected when moistened with pure water; if the first two are reddened, it indicates an acid; if the last is turned brown, an alkali.—5. If a milkiness follows the addition of a solution of hydrate of calcium before and not after the water has been boiled, it contains carbonic acid.—6. Chloride of barium occasions a white precipitate, insoluble in nitric acid if sulphuric acid or sulphates be present.—7. Oxalate of ammonium produces a white precipitate in water containing calcium salts.—8. Nitrate of silver occasions a cloudy white precipitate, insoluble in nitric acid, but soluble in ammonia, in water containing chlorine or chlorides.—9. Phosphate of sodium and ammonium (microcosmic salt), added to water that has been boiled, and precipitated by oxalic acid (if required), produces, in a few hours, a white precipitate, if the water contains magnesium salts.—10. Tincture or infusion of galls turns water containing iron black; when this takes place, both before and after the water has been boiled, the metal is present under the form of sulphate; but if it only occurs before boiling, then ferrous carbonate may be suspected, and will be precipitated as a reddish powder by exposure to air and heat.—11. Ferrocyanide of potassium gives a blue precipitate in water containing a ferric salt, and a white one, turning blue by exposure to the air, in water containing a ferrous salt.—12. Sulphuretted hydrogen and the hydro-sulphates give a brown or black precipitate in water containing copper, iron, or lead; and a yellow precipitate in water containing arsenic, or its compounds.

Purif. Pure water is incapable of putrefaction, but ordinary water contains a small quantity of organic matter in solution, which speedily undergoes decomposition, even in closed vessels. This is especially the case with water kept in wooden casks, or in open cisterns into which leaves and insects are driven by the wind. Putrescent water is highly unwholesome as a beverage; and it is a fact, clearly demonstrated by the returns of the Registrar-General, that the last visitations of cholera corresponded in severity to the impurity of the water supplied to the respective districts.

Among the methods adopted for purifying foul water are the following:—1. Filtration through, or agitation with, coarsely powdered freshly burnt charcoal, either animal or vegetable, but preferably the former. This removes both mechanically suspended matter and part of the calcareous and gaseous impurities held in solution.—2. Free exposure to the action of the air, by which the organic matters become oxidised and insoluble, and speedily subside. This may be easily effected by agitating the water in contact with fresh air, or by forcing air through it by means of bellows.—3. The addition of a little sulphuric acid has a like effect; 15 or 20 drops are usually sufficient for a gallon. This addition may be advantageously made to water intended for filtration through charcoal, by which plan at least ⅔ of the latter may be saved. (Lowitz.)—4. An ounce of powdered alum (dissolved), well agitated with a hogshead or more of foul water, will purify it in the course of a few hours, when the clear portion may be decanted. When the water is very putrid, about ½ dr. (or even 1 dr. per gal.) may be employed; any alum that may be left in solution may be precipitated by the cautious addition of an equivalent proportion of carbonate of sodium.—5. A solution of ferric sulphate acts in the same way as alum; a few drops are sufficient for a gallon.—6. Agitation with about the ½ to 1½ of finely powdered black oxide of manganese has a similar effect to the last.—7. The addition of a little aqueous chlorine, or chlorine gas, to foul water, cleanses it immediately. This method has the advantage of the water being perfectly freed from any excess of the precipitant by heat.—8. Sea water may be rendered fit for washing by the addition of a solution of carbonate of sodium or salt of tartar, as long as it turns milky. After repose, the clear portion must be decanted.—9. Sea water may be rendered fit for use as a beverage by distillation. The waste heat of the cook's galley is amply sufficient for this purpose. (There are several patent contrivances for the distillation of water on shipboard.)—10. Hard water may be softened in the same way as sea water.—11. Hard water may be both aërated and softened by the addition of a few grains of bicarbonate of potassium per gallon, followed by half as much lemon juice or tartaric acid as is sufficient to saturate the alkali in the carbonate thus added.—12. The hardness of water depending on the presence of carbonate of calcium ('temporary hardness'), including that of most rivers and many springs, may be nearly removed by ebullition; or, as recommended by Prof. Clark, by mixing the hard water with lime water in the proper proportions, when the calcium combines with the excess of carbonic acid, which previously rendered the carbonate soluble, and is precipitated as carbonate (chalk), together with the carbonate originally present. This method has been successfully carried out on the large scale.—13. Another method is to precipitate the lime by the addition of oxalate of ammonium in atomic proportion, carefully avoiding excess, and then to agitate the water with a little binoxide of manganese, in fine powder.—14. 'Permanently hard' water, that chiefly due to sulphate of calcium, may be softened by the addition of carbonate of sodium or wood-ashes.

Water, Quantitative Analysis of. The general quantitative analysis of potable waters is confined to the following: total residue; chlorine; hardness, temporary and permanent; nitrates, and nitrites, and nitrogenous organic matter.

Excess of chlorine is generally an indication of the presence of sewage, unless in the case of tidal waters; while nitrates and nitrites are usually the result of the oxidation of decomposing organic matter, and therefore, likewise, indicate more or less contamination by sewage or decomposing animal matters. The nitrogenous organic matter is usually estimated as ammonia, urea, and albuminoid matter.

Unfortunately no decisive test for, or rather method of estimation of, the actually injurious organic matter has been discovered, not even a satisfactory proof of previous sewage contamination, but the fact of obtaining albuminoid ammonia, and the presence of an appreciable amount of nitrates or nitrites is generally sufficient ground for rejecting as suspicious a water, as if not absolutely injurious, at least liable to become so at any moment.

The hardness should be determined in the natural water, and after boiling it for one hour, replacing that lost by evaporation by distilled water. The second determination gives the permanent hardness or that due to sulphate of calcium, while the first determination is the total hardness, and minus the second gives the temporary hardness, or that due to bicarbonate of calcium. Temporary hardness can be remedied by Dr. Clark's softening process, which consists in treating the water with milk of lime, which decomposes the soluble bicarbonates into carbonates, insoluble in water. Permanent hardness can be best removed for washing processes by the addition of carbonate of sodium, or by filtering the water through wood-ashes.

Solid residue. One thousand grains of the water are evaporated down to dryness in a platinium dish over a water bath, and the residue heated to about 250 Fahr. for one hour. The increase in weight of the platinium vessel gives the total solid residue.

Hardness. One thousand measured grains of the water are run into a narrow-mouthed six or eight ounce stoppered bottle, well shaken and the air sucked out by means of a piece of glass tube. The standard soap solution is now run in a little at a time, shaking well between each addition, until a permanent lather is formed over the whole surface when the bottle is placed upon its side, and lasting for five minutes. The measure of soap solution used will indicate the hardness of the water by reference to Table A. Should, however, this not take place before 320 grain measures of soap solution have been added, a second trial must be made. One thousand grain measures of soap solution are placed in the bottle with a like amount of distilled water, and treated in the same manner as before. The amount of soap solution divided by two, will indicate half the hardness of the water. In the case of extremely hard water, where even 600 measures of soap solution gives no permanent lather, to every one thousand grains of the water twice that volume of distilled water must be added, and the degree of hardness found by multiplying the degree corresponding to a third of the soap solution by three.

Table A.

Soap test measures corresponding to one thousand measures of water of each degree of hardness.

Degree of hardness.	Soap test measures.	Difference.
0	14	18
1	32	22
2	54	22
3	76	20
4	96	20
5	116	20
6	136	20
7	156	19
8	175	19
9	194	19
10	213	18
11	231	18
12	249	18
13	267	18
14	285	18
15	303	17
16	320	—

The soap test is made as follows:—Sixteen grains of pure carbonate of calcium (Iceland spar) are dissolved in pure dilute hydrochloric acid, and the whole cautiously evaporated to dryness over a water bath, redissolved in water and again evaporated to dryness. The resulting chloride of calcium, if perfectly neutral, is dissolved in one gallon of pure distilled water, and constitutes the standard water of "sixteen degrees of hardness." Good curd soap is dissolved in proof spirit, in the proportion of one ounce to the gallon. One thousand grains of the water of sixteen degrees of hardness are placed into a bottle, and this soap solution run in from a burette until a permanent lather is formed. The number of measures is noted, and the soap solution made up to such a strength that 320 grain measures produce a lather permanent for five minutes in 1000 grain measures of water of sixteen degrees of hardness.

Chlorine. Two thousand grains of the water are evaporated down to a little less than half an ounce in a platinium capsule over a water bath, and the bulk made up to 250 grains exactly with pure distilled water, a drop of neutral chromate of sodium solution is added, and a standard solution of nitrate of silver run in from a burette until a red colouration is produced. The number of grains of standard solution used multiplied by ·0035 will give the grains of chlorine in one gallon of the water.

The standard solution is prepared by dissolving 33·53 grains of pure nitrate of silver in one gallon of distilled water.

Nitrates and Nitrites. The most convenient method is Messrs. Wanklyn and Chapman's modification of Schulze's. Two thousand grains of the water are placed in a retort, and half as much of a solution of hydrate of sodium (of a strength of one in ten) added. Half the contents of the retort are distilled over, and the residue cooled. A piece of sheet aluminium is introduced into the solution and the whole allowed to stand several hours, the neck of the retort being closed by a cork (traversed by a tube moistened with hydrochloric acid and connected with a drying tube, if thought necessary). The neck of the retort (and tube) is then washed down with a little pure water, and the contents distilled over, down to about an ounce, into two or three ounces of water placed in the receiver. The contents of the receiver are made up to 2000 grains, and one half Nesslerised, as described further on. The amount of ammonia found multiplied by 259·2 gives the amount of nitrates, as nitric acid, in one gallon of the water.

Drs. Frankland and Armstrong have also described a method of estimating nitrates by the use of a special piece of apparatus, for which method we must refer the reader to the 'Journal of the Chemical Society' for March, 1868.

Nitrogen as Ammonia and Organic Matter. For the estimation of these Messrs. Wanklyn's and Chapman's is, for general use, the best and most convenient method. It depends on the conversion of the nitrogen of the nitrogenous organic matter into ammonia, and the employment of Nessler's test to estimate this ammonia.

Nessler's Reagent. 500 grains of iodide of potassium are dissolved in a small quantity of hot distilled water. Place this over a water bath, and add to it a strong aqueous solution of mercuric chloride, until the precipitate ceases to be dissolved as quickly as formed, when the addition of mercuric chloride is stopped. Filter, add to the filtrate 2000 grains of potassium dissolved in water, and dilute the volume to 10,000 grains. A little of the aqueous mercuric chloride solution is added, and the whole allowed to settle and the clear liquid decanted off.

Standard Ammonia Solution. Dissolve 27·164 grains of pure sulphate of ammonium in one gallon of distilled water. For use dilute 100 grains to 1000 grains. It will then contain 1 grain of ammonia in 100,000 of water.

In order to estimate ammonia, several tall glass cylinders, graduated at 1000 grains, and holding about six ounces, are employed. One of these is filled up to the graduation with the ammonia solution to be estimated, and about 30 grains of Nessler's reagent added from a pipette. The colouration produced is noted. A second cylinder is filled nearly to the mark with distilled water, and what is thought sufficient ammonia to produce a similar colour to the first run in, the whole made up to 1000 grains, and 30 grains of Nessler added; if after standing ten minutes, the colouration in the second is the same as in the first, the amount of ammonia solution added is the same as in the water examined; but if this is not the case, a second trial must be added, using more or less standard ammonia as the intensity of colour is less or greater than the first. After a little experience more than two trials is rarely necessary.

Examination. Five thousand grains of the water to be analysed are placed in a tubulated retort, and half an ounce of a saturated solution of carbonate of sodium added. The contents are distilled over and every 500 grains collected separately, until 1000 or 1500 has passed over, when the next portion of 500 grains is Nesslerised; if it gives no reaction, the distillation is stopped; if it does, the distillation is continued until a portion of 500 grains ceases to. The ammonia in all these portions is estimated, making each portion of 500 grains up to 1000 with distilled water, and the total put down to ammonia, from ammonium salts and urea. The ammonia from ammonium salts can be estimated by boiling 2000 grains of the water with carbonate of sodium for half an hour, making up the loss from evaporation, and by using some of this instead of distilled water in estimating the ammonia in 1000 grains of the original water, the amount of ammonia will be obtained. This substracted from the total ammonia will give the ammonia from the urea, and multiplying by 1·76 will give the amount of urea.

To the retort after all the ammonia from the urea and has been driven off, one ounce of a solution of hydrate and permanganate of potassium, of a strength of 2000 grains of hydrate of potassium and 80 grains of permanganate to 10,000 grains of water, is added, and the distillation continued until no more ammonia comes over, collecting the distillate in portions of 500 grains as before. After estimation the total ammonia obtained must be put down to ammonia set free by the decomposition of nitrogenous organic, or albuminoid bodies. By multiplying the ammonia by ten, a fairly approximate weight of these substances will be obtained.

The following are some determinations of Professor Wanklyn. (Water Analysis.)

	Grains per gallon of Ammonia from	
	Urea and Salts.	Albuminoid bodies.
Thames, London Bridge	0·123	0·024
" Hampton Court	0·003	0·002
Well near East of London	2·800	0·210
London Institution	0·0014	0·006
Bishopsgate Street pump	0·525	0·018
Bala Lake	0·0007	0·017
Loch Katrine (Glasgow)	0·0003	0·006

Pres. Water is usually preserved on shipboard in iron tanks, or in casks well charred on the inside. It cannot be safely kept in copper or leaden vessels, and receives a calcareous impregnation by contact with lime, mortar, stucco, or stone containing lime. The addition to water of about ½ to 1⅝ of finely powdered black oxide of manganese materially promotes its preservation, especially at sea, where the motion of the vessel, and the consequent agitation of the water, increases the points of contact. Water never putrefies in iron vessels, or when some fragments of metallic iron are immersed in it. Distilled water should be preserved in stoppered glass bottles or carboys. See LOTION, SOLUTION, SPIRITS, WATERS (Distilled, Eye, Mineral, Perfumed, &c.), and the articles below.

Water, Barèges. *Prep.* Take of alum, carbonate of calcium, and hard Spanish soap, of each, 2 grs.; common salt, 4 grs.; dried carbonate of sodium, 20 grs.; sulphide of potassium, 16 grs.; water, 1 quart; boil them together until the fumes of sulphuretted hydrogen begin to be evolved, then add enough water to make up 1 gallon. *Used* as a medicated lotion or bath in cutaneous diseases, from the slightest eruption to the most obstinate cases of leprosy. 60 times the above quantity formed the medicated warm bath employed by the Emperor Napoleon. See WATERS (Mineral).

Water, Carrara. *Syn.* CARBONATED LIME WATER; AQUA CALCIS SUPERCARBONATIS, L. *Prep.* From lime water (professedly prepared from lime made by calcining Carrara marble), supersaturated by strong pressure with carbonic anhydride, so that the carbonate of calcium at first thrown down is redissolved. Each ½-pint bottle contains 8 to 10 grs. of carbonate of calcium.

Water, Chalyb'eated. *Syn.* AQUA CHALYBEATA, L. *Prep.* (Ure.) Ferrous sulphate, 3 grs.; bicarbonate of potassium, 61 grs.; cold rain or distilled water, 1 quart; mix, and agitate in a corked bottle. Possesses equal tonic powers to that of the springs, but it may be rendered pleasanter by forcing in a little carbonic acid gas. See WATERS (Mineral.)

Water, Fly. *Prep.* From white arsenic, 1 dr.; boiling water, 1 pint; dissolve, and sweeten the mixture with treacle. *Used* to kill flies. A dangerous method, and one that should never be adopted where there are children.

Water, Lime. See SOLUTION OF LIME.

Water, Lith'ia. From the freshly precipitated carbonate, as solution of magnesia. Antacid and antilithic.

Water, Potash. See SOLUTION.

Water, Rose. See WATERS (Distilled).

Water, Seidlitz. See POWDERS and WATERS (Mineral).

Water, Soda. Each bottle of this liquid should contain at least 15 grs. of carbonate of sodium, but that of the shops is usually nothing else but water highly charged with carbonic anhydride. Not a particle of soda enters into its composition, on which account is cannot be substituted for the preparation of the Pharmacopœias.

To produce a superior article of soda water, the possession of a powerful aërating and bottling machine is absolutely necessary. The water employed must also be of the purest quality, the carbonic anhydride well washed with water, and the corks so prepared that they will not impart their peculiar flavour to the beverage. See Powders, Solution, and Wines.

Water, Tar. See Infusion of Tar.

WATERS (Distilled). *Syn.* Aromatic waters, Odoriferous w., Perfumed w.; Aquæ (Ph. L.), Aquæ destillatæ (Ph. E. & D.), L. Pure water, charged, by distillation, with the volatile, odorous, and aromatic principles of plants.

Prep. 1. (Ph. L.)—*a.* 2 galls. of water are put into the still along with the vegetable matter (bruised, if necessary), but only 1 gal. is drawn over. In the Ph. L. 1836, 7 fl. oz. of proof spirit were added before distillation.

b. Take of the essential oil of the plant, 2 fl. dr.; powdered silex, 2 drs.; triturate them diligently together, and then with distilled water, 1 gal., gradually added; lastly (after briskly agitating the whole for some time), strain the solution.

2. (Ph. E.) As 1, *a*, but adding of rectified spirit, 3 fl. oz., before distillation.

3. (Ph. D.) From the respective essences (Ph. D.), 1 fl. oz.; distilled water, 2 quarts; agitated well together, and then filtered through paper.

The following are the aquæ destillatæ of the British Colleges, with some others, the quantities referring to a product of 1 gal., to be prepared as above when not otherwise directed.

Angelica Water; Aqua angelicæ (P. Cod.), L. Bruised seed, 3 lbs.

Aniseed Water; Aqua anisi (Ph. D.), L.

Balm Water; Aqua melissæ (P. Cod.), L. Fresh tops, 12 lbs.

Bitter-almond Water; Aqua amygdalæ amaræ, Aqua amygdalarum amarum (P. Cod.), L. Bitter-almond cake (from which the oil has been expressed), 5 lbs.; macerate for 24 hours, and filter the distilled product through paper previously wetted with pure distilled water. Poisonous.—*Dose.* 10 to 60 drops, as a substitute for hydrocyanic acid.

Borage Water; Aqua boraginis (P. Cod.), L. Fresh leaves, 12 lbs.

Caraway Water; Aqua carui (B. P., Ph. L. & D.). Caraway, bruised, 1; water, 20; distil 10.

Cascarilla Water; Aqua corticis cascarillæ (P. Cod.), L. Cascarilla, bruised, 3 lbs.

Cassia Water; Aqua cassiæ (Ph. E.), L. Cassia, bruised, 1½ lb.

Cherry-laurel Water; Aqua laurocerasi (B. P., Ph. E. & D.), L. *Prep.* 1. (B. P.) Fresh leaves of common laurel, 16, water, 50; chop the leaves, crush them in a mortar, and macerate them in the water for twenty-four hours; distil 20 of the liquid, shake the product, filter through paper, and preserve in a stoppered bottle.—2. (Ph. E.) Fresh leaves, chopped, 10 lbs. (10 lbs.—Ph. D.). To the product add of compound spirit of lavender, 8 fl. oz.; agitate well, and, if milky, filter it (through wet paper—Ph. D. & P. Cod.).—*Dose.* 10 to 60 drops, as a substitute for hydrocyanic acid. It is commonly imitated in trade, by dissolving 75 drops (minims) of the oil of bitter almonds in 2½ fl. oz. of rectified spirit, agitating the mixture with warm distilled water, 1 gal., and filtering.

Cinnamon Water; Aqua cinnamomi (B. P., Ph. L. E. & D.), L. 1. Cinnamon, bruised, 18 oz.; or oil, 2 fl. drs.—2. (B. P.) Cinnamon, bruised, 1; water, 16; distil 8.

Clove Water; Aqua caryophilli (P. Cod.), L. Cloves, bruised, 3 lbs.

Dill Water; Aqua anethi (B. P., Ph. L. & E.), L. 1. Bruised seed, 1½ lb.; or essential oil, 2 fl. drs.—2. (B. P.) Bruised fruit, 1; water, 20; distil 10.

Elder-flower Water; Aqua sambuci (B. P., Ph. L. & E.), L. 1. Fresh elder flowers, 10 lbs.—2. (B. P.) Fresh elder flowers, separated from the stalks, 1; water 2; distil 1.

Fennel Water; Aqua fœniculi (B. P., Ph. L. E. & D.), L. As dill water.

Hyssop Water; Aqua hyssopi (P. Cod.), L. Fresh tops, 12 lbs.

Juniper Water; Aqua baccæ juniperi (P. Cod.), L. Berries, bruised, 3 lbs.

Lavender Water; Aqua lavendulæ (P. Cod.), L. Flowering tops, 3 lbs.

Lettuce Water; Aqua lactucæ (P. Cod.), L. Fresh lettuces, bruised, 12 lbs.

Melilot Water; Aqua mellioti (P. Cod.), L. Dried flowers, 3 lbs.

Mint Water, Spearmint w.; Aqua menthæ viridis (B. P., Ph. L. E. & D.), L. 1. Dried herb, 2 lbs.; or fresh herb, 4 lbs.; or essential oil, 2 fl. drs.—2. (B. P.) English oil of spearmint, 1½ drm.; water, 1½ gal.; distil 1 gal.

Orange-flower Water; Aqua aurantii floris (B. P., Ph. L.), A. florum aurantii, L. "Water distilled from the flowers of *Citrus Bigaradia*, Risso, and *Citrus Aurantium*, D. C." (Ph. L.) Orange flowers, 10 lbs.; proof spirit, 7 fl. oz. (Ph. L. 1836.)

Origanum Water; Aqua origani (P. Cod.), L. Dried flowers, 3 lbs.

Peach Water; Aqua persicæ (P. Cod.), L. Fresh leaves, chopped small, 12 lbs.; as cherry-laurel water.

Pennyroyal Water; Aqua pulegii (Ph. L. & E.), Aqua menthæ pulegii (Ph. D.), L. As mint water (*above*).

Peppermint Water; Aqua menthæ piperitæ (B. P., Ph. L. E. & D.), L. As mint water (*above*).

Pimento Water; Aqua pimentæ (B. P., Ph. L. E. & D.), L. 1. Pimento, bruised, 1 lb.; or oil, 2 fl. drs.—2. (B. P.) Pimento, bruised, 1; water, 23, nearly; distil one half.

Rose Water; Aqua rosæ (B. P., Ph. L. E. & D.), L. Damask or hundred-leaved rose, 10 lbs. Ph). L. & E.).—Otto, 40 drops. (Ph. D.)—Fresh cabbage-rose petals, 1; water, 2; distil 1 (B. P.).

Sage Water; Aqua salviæ (P. Cod.), L. As lavender water (*above*).

Sassafras Water; Aqua ligni sassafras (P. Cod.), L. Sassafras chips. 3 lbs.

Spearmint Water. See Mint Water.

Tansy Water; Aqua tanaceti (P. Cod.), L. Flowering tops, 6 lbs.

Thyme Water; Aqua thymi (P. Cod.), L. As the last.

Valerian Water; Aqua valerianæ, A. radicis v. (P. Cod.), L. Root, bruised, 3 lbs.

Vanilla Water; Aqua vanillæ, L. Vanilla, coarsely powdered, 1 lb.; salt, 5 lbs.; water, 2½ galls.; macerate for 24 hours in a covered vessel, then distil 1 gal.

Uses, &c. Distilled waters are mostly employed as vehicles or perfumes. A few, as bitter-almond, cherry-laurel, and peach water, are poisonous in doses larger than a few drops. The *dose* of the aromatic or carminative waters, as those of dill, caraway, peppermint, pennyroyal, &c., is a wine-glassful, *ad libitum*.

Concluding remarks. In the preparation of distilled waters for medicinal purposes, the utmost care should be taken to prevent contamination from contact with either copper, lead, or zinc, since these metals are gradually oxidised and dissolved by them. In preparing them from the essential oils, silica, in impalpable powder, is the best substance that can be employed to promote the division and diffusion of the oil, as directed in the Ph. L. Magnesia and sugar, formerly used for the purpose, are objectionable; as the first not only decomposes a portion of the oil, but the water is apt to dissolve a little of it, and is hence rendered unfit to be used as a solvent for metallic salts, more especially for corrosive sublimate and nitrate of silver; whilst the other causes the water to ferment and acetify.

In the distillation of waters intended for perfumery, the utmost care is requisite to produce a highly fragrant article. The still should be furnished with a high and narrow neck, and the heat of steam, or a salt-water bath, should alone be employed. The first 2 or 3 fl. oz. of the runnings should be rejected, except when spirit is used, and the remainder collected until the proper quantity be obtained, when the whole product should be mixed together, as distilled waters progressively decrease in strength the longer the process is continued. When a very superior article is desired, the waters may be redistilled by a gentle heat, the first two thirds only being preserved. The herbaceous odour of recently distilled waters is removed by keeping them for some months, loosely covered in a cold cellar.

When distilled waters have been carefully prepared, so that none of the liquor in the still has 'spirted' over into the condensing worm, they keep well, and are not liable to change; but when the reverse is the case, they frequently become ropy and viscid. The best remedy for this is to redistil them. Waters which have acquired a burnt smell in the 'stilling' lose it by freezing. Distilled waters may be prevented from turning sour by adding a little calcined magnesia to them, and those which have begun to spoil may be recovered by adding 1 gr. each of borax and alum to the pint. This doctoring is not, however, to be recommended, and should never be adopted for those used in medicine. A drop of solution of terchloride of gold added to these waters shows whether they contain any uncombined essential oil, by forming, in that case, a fine metallic film on the surface. After distilled waters have acquired their full odour, they should be carefully preserved in well-stopped bottles. Some houses keep a separate still for each of the more delicate perfumed waters, as it is extremely difficult to remove any odour that adheres to the body of the still and worm. The addition of the small quantity of spirit ordered in the Ph. E., and Ph. L. 1836, in the preparation of their waters, in no way tends to promote their preservation.

In general, the druggist draw off 2 galls., or more, of water from the quantities of the herbs, barks, seeds, or flowers, ordered in the Pharmacopœias; hence the inferior quality of the waters of the shops. They do, however, very well for vehicles. The perfumers, on the contrary, use an excess of flowers, or at least reserve only the first and stronger portion of the water that distils over, the remainder being collected and used for a second distillation of fresh flowers.

The most beautiful distilled waters are those prepared in the south of France, and which are imported into England under the French names. Thus eau de rose, eau de fleurs d'oranges, &c., are immensely superior to the best English rose or orange-flower water, &c. The water that distils over in the preparation of the essential oils is usually of the strongest and finest class. See Essence, Oils (Volatile), Spirits (Perfumed), Vegetables, &c.

WATERS (Eye). *Syn.* Collyria, L. *Prep.* 1. From distilled vinegar, 1 fl. oz.; distilled water, ½ pint. ½ fl. oz. of rectified spirit, or 1 fl. oz. of brandy, is often added. In simple chronic ophthalmia, blear eyes, &c., also to remove particles of lime from the eyes.

2. Sugar of lead, 10 grs.; pure vinegar, ½ teaspoonful; distilled water, ½ pint. In ophthalmia, as soon as active inflammation ceases; also as the last.

3. Wine of opium, 2 fl. drs.; sulphate of zinc, 20 grs.; distilled water, ½ pint. Astringent and anodyne; in painful ophthalmia and extreme irritability.

4. Opium, 15 grs.; boiling water, 8 fl. oz.;

when cold, add of solution of acetate of ammonia, 2½ fl. oz., and filter. As the last.

5. Sulphate of zinc, 20 grs.; distilled water, ½ pint; dissolve. An excellent astringent water in chronic ophthalmia, weak and irritable eyes, &c.

6. Sulphate of copper, 10 grs.; camphor mixture (julep), ½ pint; dissolve. In the purulent ophthalmia of infants.

7. Camphor julep, 5 fl. oz.; solution of acetate of ammonia and rose water, of each, 2½ fl. oz.; mix. For weak or swollen eyes, particularly after ophthalmia.

8. Chloride of barium, 30 grs.; distilled water, ½ pint. In the ophthalmia of scrofulous and syphylitic habits.

9. (Bate's.) From blue vitriol, 15 grs.; camphor, 4 grs.; hot water, ¼ pint; agitate in a corked bottle, and, when cold, make it up to 4 pints, and filter. In purulent ophthalmia and blear eyes.

10. (Goulard's.) From solution of diacetate of lead, 16 drops; distilled water, ½ pint; mix. As No. 2.

11. (Krimer.) Hydrochloric acid, 20 drops; mucilage, 1 dr.; water, 2 fl. oz. To remove particles of iron or lime from the eye.

12. (Marshall's 'eye-drops.') Nitrate of silver, 2 grs.; dilute nitric acid, 2 drops; pure soft or distilled water, 1 fl. oz.; dissolve; add powdered gum, 15 grs.; agitate until dissolved, and the next day decant the clear portion.

13. (P. Cod.) Extract of opium, 4 grs.; rose water, 4 fl. oz.; dissolve. In painful ophthalmia.

WATERS (Min'eral). *Syn.* Saline waters; Aquæ minerales, L. Our space will not permit a description of these individually. The tables given on *pages* 1168-69, exhibiting their composition, will, however, enable the reader, with a little attention, to produce artificial waters more closely resembling the natural ones that can be done by adopting any of the numerous formulæ published for the purpose. The 'aërated waters' are charged with 5 or 6 times their volume of carbonic acid gas, by means of the apparatus employed by the soda-water manufacturers. On the small scale, the gas is often produced by the reaction of the ingredients on each other, in which case, on the introduction of the latter, the bottle must be instantly closed and inverted. Distilled water, or filtered rain water, should alone be employed in their composition; and for the chalybeated and sulphuretted waters, it should be first boiled, and allowed to cool out of contact with the air.

In addition to the tables, it may be remarked that traces of iodine have been found in the water of Cheltenham (old well), traces of bromine in the water of Epsom, and traces of both bromine and iodine in that of Leamington (royal pump). Manganese has been found in the waters of Tunbridge, Carlsbad, Spa, Pyrmont, Marienbad, Saidschüts, &c. Traces of phosphoric and fluoric acid have also been found in some mineral waters. It is the opinion of many high authorities that the medicinal virtues of these waters depend more on the minute quantities of the above substances, and the high state of dilution in which they are held, than on their more abundant saline ingredients.

WATERS (Perfumed'). *Syn.* Aquæ odoriferæ, L. The simple distilled waters of the perfumer have been already noticed (see *pages* 1165-66). They may be prepared from any substances which imparts its fragrance to water by distillation. The compound waters (eaux) employed as perfumes consist of very pure rectified spirit, holding in solution essential oils, or other odorous matter, and resemble the esprits, essences, and spirits, before noticed. They differ from extraits in being mostly colourless, or nearly so, and in being generally prepared by distillation, or by the addition of the pure essential oils or essences to carefully rectified and perfectly scentless spirit; whereas the extraits are mostly and preferably prepared by macerating the flowers, &c., in the spirit, or by digesting the spirit with the oils, in the manner noticed under Spirits (Perfumed). Extraits are preferred to eaux and esprits as the basis of good perfumery, where the colour is not objectionable.

The following are a few additional formulæ and remarks:—

Angel Water, Portugal w. From orange-flower and rose water, of each, 1 pint; myrtle water, ½ pint; essence of ambergris, ½ fl. oz.; essence of musk, ¼ fl. oz.; shake them well together for some hours, then filter the mixture through paper.

Eau d'Ange, Fr.; Aqua myrti, L. From myrtle flowers, 3½ lbs.; water, 2 galls.; distil a gallon. A pleasant perfume.

Eau d'Ange bouillée, Fr. From rose water and orange-flower water, of each, 3 pints; benzoin, ½ lb.; storax, ¼ lb.; cinnamon, 1 oz.; cloves, ½ oz.; 3 fresh-emptied musk bags; digest in a securely covered vessel, at nearly the boiling heat, for 2 hours, then allow it to cool; strain off the clear, press the remainder, and filter for use. Very fragrant.

Eau d'Ange distillée, Fr. From benzoin, 4 oz.; storax, 2 oz.; cloves, ½ oz.; calamus and cinnamon, of each, ¼ oz.; coriander seeds, 1 dr.; (all bruised;) water, 3 quarts; distil 2 quarts. Eau d'Ange distillée et musquée is made by adding a little essence of musk to the distilled product. Both are highly fragrant.

Eau de Naphe, Eau le naphe, Fr.; Aqua naphæ, L. This article is distilled in Languedoc from the leaves of the bigarade, or bitter-orange tree, but the preparation sold in England under this name is often prepared as follows:—Orange flowers, 7 lbs.; fresh yellow peel of the bigarade or Seville orange, ½ lb.; water, 2 galls.; macerate 24 hours, and distil

I. Table *exhibiting the Composition of several of the more celebrated* Mineral Waters.

16 fl oz. contain the following Ingredients:—

WATERS.	Nitrogen in cubic inches.	Carbonic anhydride in cubic inches.	Sulphuretted hydrogen in cubic inches.	Carbonate of sodium in grains.	Carbonate of magnesium in grains.	Carbonate of calcium in grains.	Sulphate of sodium in grains.	Sulphate of magnesium in grains.	Sulphate of calcium in grains.	Chloride of sodium in grains.	Chloride of magnesium in grains.	Chloride of calcium in grains.	Ferric Oxide	Silica.	Temperature.	Total of saline contents.	AUTHORITY.
CARBONATED.																	
Seltzer	...	17·	...	4·	5·	3·	...	...	...	17·	...	...	...	...	Cold	29	Bergman.
Pyrmont	...	26·	...	...	10·	4·5	...	5·5	8·5	1·5	...	...	0·6	...	do.	30·6	Ditto.
Spa	...	13·	...	1·5	4·5	1·5	...	...	...	0·2	...	...	0·6	...	do.	8 3	Ditto.
Carlsbad	...	5·	...	5·	...	1·5	8·5	...	...	4·5	...	...	a trace	0·3	165°	19·8	Klaproth.
Pouges	...	30·	...	10·	1·2	12·	...	...	...	2·2	...	...	2·5	0·5	Cold	28·4	Hassenfratz.
Saint Parize	...	22·	...	...	0·5	11·5	...	...	13·	...	...	...	...	...	do.	25·	Ditto.
CHALYBEATE.																	
Tunbridge	0·59	1·	{trace of oxygen}	...	...	0·03	...	...	0·17	0·30	0·03	0·05	0·28	...	do.	0·86	Scudamore.
Cheltenham Chalybeate	...	2·5	...	0·5	...	...	22·7	6·	2·5	41·3	...	...	0·8	...	do.	73·8	Parkes & Brande.
Brighton	...	2·2	...	...	...	...	...	...	4·	3·	0 75	...	1·4	0·14	do.	9·29	Marcet.
SALINE.																	
Seidlitz	...	...	...	...	2·5	0·8	...	180·	5·	...	4·5	...	...	...	do.	192·8	Bergman.
Cheltenham Pure Saline	...	...	...	...	...	...	15·	11·	4·5	50·	...	...	...	...	do.	80·5	Parkes & Brande.
Bristol	...	3·5	...	...	...	1·5	1·5	...	1·5	0·5	1·	...	...	...	74°	6·	Carrick.
Buxton	0·2	...	...	...	...	1·3	...	...	0·8	0 2	...	...	0·03	...	82°	1·83	Pearson.
Bath	...	1·2	...	..	...	0·8	1·5	...	9·	3·3	...	...	a trace	0·2	116°	14·8	Phillips.
Scarborough	...	...	...	...	...	a trace	20·	...	9·	...	...	...	do.	...	Cold	29·	Saunders.
Barèges	...	...	uncertain	2 5	...	ditto	...	...	a trace	0·5	...	...	...	...	120°	3·	Ditto.
Plombières	...	...	...	2·2	...	0·3	2·3	...	...	1·5	...	...	...	0·3	?	6·6	Vauquelin.
Kilburn	...	3·5	8·54?	...	0·5	1·	12·	37·	5·5	2·5	5·5	0·2	a trace	...	Cold	64·2	Schmeisser.
Leamington New Bath	0·4	a trace	a trace	...	...	...	19·	...	14·	53·	1·5	...	0·8	...	do.	88·3	Lambe.
Leamington Old Bath	0·3	...	ditto	...	...	...	7·5	7·	18·	41·	...	...	...	...	do.	73·5	Ditto.
SULPHUROUS.																	
Harrogate	0·8	1·	2·3	...	0·7	2·5	...	1·3	...	77·	11·	1·5	...	...	do.	94·	Garnet.
Moffat	0·5	0·6	1·2	...	...	...	...	...	...	4·5	...	...	...	...	do.	4·5	Ditto.
Aix-la-Chapelle	...	...	5·5	12·	...	4·2	...	...	...	5·	...	...	...	...	143°	21·2	Bergman.
Cheltenham Sulphur Spring	...	...	1·5	...	...	...	23 5	5·	1·2	85·	...	...	0·8	...	Cold	65·	Parkes & Brande.

II. Table *exhibiting the Composition of the principal* Mineral Waters *of* Germany, *and of the* Saratoga Congress Spring *of* America, *re-arranged expressly for this work.*

Grains of *anhydrous ingredients* in one pound troy.	Adelheids-Quelle.	Auschowitz. Ferdinands-Brunnen.	Carlsbad.	Eger. Franzens-Brunnen.	Ems.	Fachingen.	Kissengen. Ragozi.	Kreuznach. Elizen-Brunnen.	Marienbad. Kreuzbr.	Püllna.	Pyrmont.	Saratoga Congress Spring.	Schlesischer. Obersalz-Brunnen.	Seidschutz.	Selters.	Spa Pouhon.
Carbonate of Soda . .	5·2443	4·5976	7·2712	3·8914	8·0625	12·3328	...	...	5·3499	...	...	0·8261	7·6211	...	4·6162	0·5531
„ Lithia . .	0·0902	0·0507	0·0150	0·0282	0·0405	...	...	...	0·0858	...	...	...	...	...	...	...
„ Baryta . .	0·0024	...	...	...	0·0022	...	...	...	...	...	...	...	...	...	0·0C14	...
„ Strontia .	0·0387	0·0040	0·0055	0·0023	0·0080	...	0·0592	...	0·0028	...	...	0·0672	0·0170	...	0·0144	...
„ Lime . .	0·4703	3·0085	1·7775	1·3501	0·8555	1·8667	4·8180	0·2058	2·9509	0·5775	4·7781	5·8531	1·5464	5·1045	1·4004	0·7387
„ Magnesia .	0·2980	2·2867	1·0275	0·5040	0·5915	1·2983	1·3185	1·1812	2·0390	4·8045	...	4·1155	1·5496	0·8235	1·5000	0·8421
„ (Proto) Manganese	0·0012	0·0692	0·0048	0·0322	0·0028	...	0·0121	0·0072	2·0288	...	0·0364	0·0202	0·0026	0·0032	...	0·0389
„ (Proto) Iron . .	0·0121	0·2995	0·0208	0·1762	0·0120	...	0·1397	0·1495	0·1319	...	0·3213	0·0173	0·0356	0·0095	...	0·2813
Sub-Phos. of Lime . .	...	...	0·0012	0·0172	...	0·0061	...	...	...	0·0026	...	...	...	0·0117	0·0007	0·0102
„ Alumina .	...	0·0040	0·0019	0·0092	0·0014	...	...	...	...	...	0·0110	...	...	0·0088	0·0020	0·0064
Sulphate of Potassa . .	0·0066	...	...	...	0·4050	...	1·2540	...	...	3·6000	0·0314	0·1379	0·3160	3·6705	0·2978	0·0593
„ Soda . .	...	16·9022	14·9019	18·3785	...	0·1267	...	...	28·5868	92·8500	1·6092	...	2·5106	17·6220	...	0·0281
„ Lithia . .	...	...	...	...	...	...	...	...	...	...	0·0067	...	...	...	...	...
„ Lime . .	...	...	...	...	...	...	5·5485	...	...	1·9500	5·0265	...	...	1·1287	...	...
„ Strontia . .	...	...	...	...	...	...	...	...	...	...	0·0154	...	...	0·0347	...	...
„ Magnesia .	...	...	...	...	...	...	...	...	...	69·8145	2·3684	...	...	62·3535	...	...
Nitr. of Magnesia . .	...	...	...	...	...	...	...	...	...	...	...	0·1004	...	5·9302	...	...
Chlor. of Ammonium .	...	...	...	...	...	...	0·0364	...	...	...	...	0·0326	0·0164	...	...	...
„ Potassium . .	0·1845	...	...	...	0·0338	...	...	0·7287	...	...	...	1·6256	...	...	0·2685	...
„ Sodium . .	28·4608	6·7472	5·9820	6·9229	5·7255	3·2337	39·3733	54·6917	10·1727	...	...	19·6653	0·8682	...	12·9690	0·3371
„ Lithium . .	...	...	...	...	...	...	...	0·0562	...	...	...	...	...	...	...	...
„ Calcium . .	...	...	...	...	...	...	...	9·7358	...	...	...	...	...	...	...	...
„ Magnesium . .	...	...	...	...	...	...	3·6599	...	...	14·7495	0·8450	...	...	1·2223	...	...
„ Barium . .	...	...	...	...	...	...	...	0·2366	...	...	...	...	...	...	...	...
„ Strontium . .	...	...	...	...	...	...	...	0·5494	...	...	...	...	...	...	...	...
Bromide of Sodium . .	0·3060	...	...	...	...	...	0·3331	0·2304	...	...	...	0·1613	0·0051	...	...	...
Iodide of Sodium . .	0·1500	...	...	...	...	...	...	0·0024	...	...	...	0·0046	...	...	...	...
Fluoride of Calcium . .	...	...	0·0184	...	0·0014	...	...	...	...	...	...	...	...	...	0·0013	...
Alumina	0·0166	...	...	...	...	...	...	0·0086	0·0023	...	...	0·0069	...	...	...	...
Silica	0·1922	0·5023	0·4329	0·3548	0·3104	0·0657	0·1609	0·2355	0·2908	0·1320	0·3727	0·1112	0·2423	0·0900	0·2265	0·3739
Total Saline contents . .	35·4739	34·4719	31·4606	31·6670	16·0525	18·9300	56·7136	68·0190	51·6417	188·4806	15·4221	32·7452	14·7309	98·0133	21·2982	3·2691
Carbonic Acid Gas in 100 cubic inches . .	10	154	58	154	51	135	96	12	105	7	160	114	98	20	126	136
Temperature, Fahr. .	58°	49°	Spru. 165° Neub. 138° Mühl. 128° Ther. 122°	54°	Kess. 117° Krän. 84°	50°	53°	47°	53°	58°	56°	50°	58°	58°	58°	58°
Authorities . . .	Struve.	Steinm.	Berzelius.	Berzelius.	Struve.	Bischoff.	Struve.	Struve.	Berzelius.	Struve.	Struve.	Schweitz.	Struve.	Struve.	Struve.	Struve.

1 gal. In many cases ordinary orange-flower water is sold for eau de naphe.

Rose Water. From otto of roses, 3 drs.; rectified spirit (warm), 1 pint; dissolve, add of hot water, 10 galls.; mix in a 12-gallon carboy, cork, and well agitate the whole until quite cold. This makes the ordinary rose water of the shops, and is really excellent, but it is better for distillation. See Waters (Distilled).

Unparalleled Water; Eau incomparable, Fr. From oil of lemon, 4 drs.; oil of bergamot, 2½ drs.; oil of cedrat, 2 drs.; rectified spirit, 3½ pints; Hungary water, ½ pint; mix, and distil all but 9 oz. (Guibourt.)

WATER BRASH. See Pyrosis.

WATER-COLOUR CAKES. These are prepared from any of the ordinary pigments that work well in water, made into a stiff and perfectly smooth paste with gum water, or isinglass size, or a mixture of the two, and then compressed in polished steel moulds, and dried. See Painting, and the respective pigments.

WATER CRESS. The *Nasturtium officinale*, a well-known plant of the natural order *Cruciferæ*. It is alterative and antiscorbutic, and was formerly used in medicine, but now chiefly as a salad, or a refreshing relish at breakfast.

WATER-POX. See Chicken-pox.

WATERPROOFING. Cloth is 'waterproofed' as follows:—

1. Moisten the cloth, on the wrong side, first with a weak solution of isinglass, and, when dry, with an infusion of nut-galls.

2. As the last, but substitute a solution of soap for isinglass, and another of alum for galls.

3. (Hancock's Patent.) By spreading the liquid juice of the caoutchouc tree upon the inner surface of the goods, and allowing them to dry in the air. Absolutely chimerical.

4. (Potter's Patent.) The cloth is first imbued on the wrong side with a solution of isinglass, alum, and soap, by means of a brush; when dry, it is brushed on the same side against the grain, and then gone over with a brush dipped in water. Impervious to water, but not to air.

5. (Sievier's Patent.) By applying first a solution of India rubber in oil of turpentine, and afterwards another India rubber varnish, rendered very drying by the use of driers. On this, wool or other material of which the fabric is made, cut into proper lengths, is spread, and the whole passed through a press, whereby the surface acquires a nap or pile.

6. A simple method of rendering cloth waterproof, without being airproof, is to spread it on any smooth surface, and to rub the wrong side with a lump of bees' wax (perfectly pure and free from grease), until it presents a light, but even, white or grayish appearance; a hot iron is then to be passed over it, and the cloth being brushed whilst warm, the process is complete. When the operation has been skilfully performed, a candle may be blown out through the cloth, if coarse, and yet a piece of the same, placed across an inverted hat, may have several glassfuls of water poured into the hollow formed by it, without any of the liquid passing through. Pressure or friction will alone make it do so. "We have shown this to numerous cloth-manufacturers, waterproofers, tailors, and others, several of whom have adopted the method very extensively, and with perfect success." (Cooley.)

7. About the year 1862 a patent was taken out by Dr. Stenhouse for employing paraffin as a means of rendering leather waterproof, as well as the various textile and felted fabrics; and in August, 1864, an additional patent was granted to him for an extension of and improvement on the previous one, which consisted chiefly in combining the paraffin with various proportions of drying oil, it having been found that paraffin alone, especially when applied to fabrics, became to a considerable extent detached from the fibre of the cloth after a short time, owing to its great tendency to crystallise. The presence, however, of even a small quantity of drying oil causes the paraffin to adhere much more firmly to the texture of the cloth, from the oil gradually becoming converted into a tenacious resin by absorption of oxygen.

In the application of paraffin for waterproofing purposes it is first melted along with the requisite quantity of drying oil and cast into blocks. This composition can then be applied to fabrics by rubbing them over with a block of it, either cold or gently warmed, or the mixture may be melted and laid on with a brush, the complete impregnation being effected by subsequently passing it between hot rollers. When this paraffin mixture has been applied to cloth such as that employed for blinds or tents, it renders it very repellant to water, although still pervious to air.

Cloth paraffined in this manner forms an excellent basis for such articles as capes, tarpaulins, &c., which require to be rendered quite impervious by subsequently coating them with drying oil, the paraffin in a great measure preventing the well-known injurious effect of drying oil on the fibre of the cloth. The paraffin mixture can also very advantageously be applied to the various kinds of leather. One of the most convenient ways of effecting this is to coat the skins or manufactured articles, such as boots, shoes, harness, pump-buckets, &c., with the melted composition, and then to gently heat the articles until it is entirely absorbed. When leather is impregnated with the mixture, it is not only rendered perfectly waterproof, but also stronger and more durable. The beneficial effects of this process are peculiarly observable in the case of boots and shoes, which it renders very firm without destroying their elasticity. It, therefore, not only makes them exceedingly durable, but possesses an advantage over ordinary dubbing in not interfering with the polish of these articles, which, on the whole, it rather improves.

The superiority of paraffin over most other materials for some kinds of waterproofing consists in its comparative cheapness, in being easily applied, and in not materially altering the colour of fabrics, which in the case of light shades and white cloth is of very considerable importance.

WATERPROOF LIQUID. *Prep.* 1. India rubber, in fragments, 1 oz.; boiled oil, 1 pint; dissolve by heat, carefully applied, then stir in of hot boiled oil, 1 pint, and remove the vessel from the fire.

2. Boiled oil, 1 pint; bees' wax and yellow resin, of each, 2 oz.; melt them together.

3. Salad oil, 1 pint; mutton suet, ¼ lb.; white wax and spermaceti, of each, 1 oz.; as the last. For 'ladies' work.'

Obs. The above are used for boots, shoes, harness, leather straps, leather trunks, &c., applied warm before the fire.

WAX. *Syn.* BEES' WAX, YELLOW W.; CERA (Ph. L.), CERA FLAVA (B. P., Ph. E. & D.), L. The substance which forms the cells of bees; obtained by melting the comb in water, after the honey has been removed, straining the liquid mass, remelting the defecated portion, and casting it into cakes.

Pure bees' wax has a pleasant ceraceous odour, a pale yellowish-brown colour, and the sp. gr. ·960 to ·965. It is brittle at 32°, softens and becomes plastic at 88 or 90°, and melts at 154 to 155° Fahr. "It becomes kneadable at about 85°, and its behaviour while worked between finger and thumb is characteristic. A piece the size of a pea being worked in the hand till tough with the warmth, then placed upon the thumb, and forcibly stroked down with the forefinger, curls up, following the finger, and is marked by it with longitudinal streaks." (B. S. Proctor.) It is very frequently adulterated with farina, resin, and mutton suet or stearin. Dr. Normandy met with a sample containing 23% of effloresced sulphate of soda. The first may be detected by oil of turpentine, which dissolves only the wax,—the second, by its solubility in cold alcohol, and by its terebinthinate taste,—the third and fourth, even when forming less than 2% of the wax, may be detected by it affording sebacic acid on distillation. When greasy matter is present in any considerable quantity, it may also be detected by the suspected sample having an unctuous feel and a disagreeable taste. Saline matter may be detected by the loss of weight, when a weighed quantity of the wax is boiled in water. Heavy substances, as chalk, plaster of Paris, white lead, oxide of zinc, &c., may also be thus separated, since they subside, owing to their superior gravity, to the bottom of the vessel. The rough mealy fracture of pure wax is rendered finer grained, smoother, and duller, by the addition of lard or spermaceti, and becomes sparkling and more granular by the addition of resin." (Proctor.)

Wax, Bleached. See WHITE WAX (*below*).

Wax, Etching. See ETCHING GROUND and VARNISH.

Wax, Facti″tious. *Syn.* CERA FLAVA FACTITIA, L. A spurious compound, sold by the farrier's druggists for veterinary purposes.

Prep. 1. From yellow resin, 16 lbs.; hard mutton suet or stearin, 8 lbs.; palm oil, 2½ lbs.; melted together.

2. As last, but substituting turmeric, 1 lb., for the palm oil.

3. Best annotta, 6 oz. or q. s.; water, 1 gal.; boil; add, of hard mutton suet or stearin, 35 lbs.; yellow resin, 70 lbs.; again boil, with constant agitation, until perfectly mixed and of a proper colour, and, as soon as it begins to thicken, pour it out into basins to cool. When cold, rub each cake over with a little potato starch.

Wax, Gilder's. See GILDING.

Wax, Mod'eling. *Prep.* Take of bees' wax, lead plaster, olive oil, and yellow resin, equal parts; whiting, q. s. to form a paste; mix well, and roll it into sticks. Colours may be added at will.

Wax, Refined. Crude wax, especially that imported, is generally loaded with dirt, bees, and other foreign matter. To free it from these substances, it undergoes the operation of 'refining.' This is done by melting the wax along with about 4 or 5% of water in a bright copper or stone-ware boiler, preferably heated by steam, and, after the whole is perfectly liquid, and has boiled for some minutes, withdrawing the heat, and sprinkling over its surface a little oil of vitriol, in the proportion of about 5 or 6 fl. oz. to every cwt. of wax. This operation should be conducted with great care and circumspection; as, when done carelessly, the melted wax froths up, and boils over the sides of the pan. The acid should also be well scattered over the whole surface. The melted wax is next covered over, and left for some hours to settle, or until it becomes sufficiently cool to be drawn off for 'moulding.' It is then very gently skimmed with a hot ladle, baled or decanted into hot tin 'jacks,' and by means of these poured into basins, where it is left to cool. Great care must be taken not to disturb the sediment. When no more clear wax can be drawn off, the remainder in the melting-pan is allowed to cool, and the cake, or 'foot,' as it is called, is taken out, and the impurities (mostly bees) scraped from its under surface. The scraped cake is usually reserved for a second operation; but if required, it may be at once remelted, and strained through canvas into a mould.

Much of the foreign wax has a pale dirty colour, which renders it, no matter however pure, objectionable to the retail purchaser. Such wax undergoes the operation of 'colouring' as well as 'refining.' A small quantity of the best roll annotta, cut into slices (¼ lb., more or less, to wax, 1 cwt., depending on the paleness of the latter), is put into a clean boiler with about a gallon of water, and boiled for some time, or until it is perfectly dissolved, when a few ladlefuls of the melted wax are added, and the boiling continued until the wax has taken up all the colour, or until the water is mostly evaporated. The portion of wax thus treated has now a deep orange colour, and is added, in quantity as required, to the remainder of the melted wax in the larger boiler until the proper shade of colour is produced when cold; the whole being well mixed, and a sample of it cooled now and then, to ascertain when enough has been added. The copper is next brought to a boil, and treated with oil of vitriol, &c., as before. Some persons add palm oil (bright) to the wax, until it gets sufficient colour, but this plan is objectionable from the quantity required for the purpose being often so large as to injure the quality of the product; besides which the colour produced is inferior, and less transparent and permanent than that given by annotta.

Another method of refining crude wax, and which produces a very bright article, is to melt it in a large earthen or stoneware vessel, heated by steam or a salt-water bath, then to cautiously add to it about 1% of concentrated nitric acid, and to continue the boiling until nitrous fumes cease to be evolved, after which the whole is allowed to settle, and is treated as before.

Obs. The great art in the above process is to produce a wax which shall at once be 'bright,' or semi-translucent in thin places, and good coloured. The former is best ensured by allowing the melted mass to settle well, and by carefully skimming and decanting the clear portion without disturbing the sediment. It should not be poured into the moulds too warm, as, in that case, it is apt to 'separate,' and the resulting cakes to be 'streaky,' or of different shades of colour. Again, it should be allowed to cool very slowly. When cooled rapidly, especially if a current of air fall upon its surface, it is apt to crack, and to form cakes full of fissures. Some persons, who are very nice about their wax, have the cakes polished with a stiff brush when quite cold and hard. It is absolutely necessary that the 'jacks' or cans, ladles, and skimmers, used in the above process, be kept pretty hot, as without this precaution the wax cools, and accumulates upon them in such quantity as to render them inconvenient, and often quite useless, without being constantly scraped out.

Wax, Seal'ing. *Prep.* 1. (RED.)—*a.* Take of shell-lac (very pale), 4 oz.; cautiously melt it in a bright copper pan over a clear charcoal fire, and, when fused, add of Venice turpentine, 1¼ oz.; mix, and further add of vermilion, 3 oz.; remove the pan from the fire, cool a little, weigh it into pieces, and roll them into circular sticks on a warm marble slab by means of a polished wooden block; or it may be poured into moulds whilst in a state of fusion. Some persons polish the sticks with a rag until quite cold.

b. From shell-lac, 3 lbs.; Venice turpentine, 1¼ lb.; finest cinnabar, 2 lbs.; mix as before. Both the above are 'fine.'

c. As the last, but using ½ less of vermilion. Inferior.

d. Resin, 4 lbs.; shell-lac, 2 lbs.; Venice turpentine and red lead, of each, 1½ lb.; as before. Common.

2. (BLACK.)—*a.* From shell-lac, 60 parts; finest ivory black, reduced to an impalpable powder, 30 parts; Venice turpentine, 20 parts. Fine.

b. Resin, 6 lbs.; shell-lac and Venice turpentine, of each, 2 lbs.; lampblack, q. s. Inferior.

3. (GOLD-COLOURED.) By stirring gold-coloured mica spangles or talc, or aurum musivum, into the melted resins just before they begin to cool. Fine.

4. (MARBLED.) By mixing 2 or 3 different coloured kinds just as they begin to grow solid.

5. (SOFT.)—*a.* (Red.) Take of bees' wax, 8 parts; olive oil, 5 parts; melt, and add, of Venice turpentine, 15 parts; red lead, to colour. —*b.* (Green.) As the last, but substituting powdered verdigris for red lead. Both are used for sealing official documents kept in tin boxes; also as a cement.

6. (BOTTLE WAX.)—*a.* (Black.) From black resin, 6½ lbs.; bees' wax, ½ lb.; finely powdered ivory black, 1½ lb.; melted together.—*b.* (Red.) As the last, but substitute Venetian red or red lead for ivory black.

Obs. All the above forms for 'fine' wax produce 'superfine' by employing the best qualities of the ingredients; and 'extra superfine,' or 'scented,' by adding 1% of balsam of Peru or liquid storax to the ingredients when considerably cooled. The 'variegated' and 'fancy coloured kinds' are commonly scented with a little essence of musk or ambergris, or any of the more fragrant essential oils. The addition of a little camphor, or spirit of wine, makes sealing-wax burn easier. Sealing-wax containing resin, or too much turpentine, runs into thin drops at the flame of a candle.

Wax, White. *Syn.* BLEACHED WAX; CERA ALBA (B. P., Ph. L. E. & D.), L. *Prep.* From pure bees' wax, by exposing it in thin flakes to the action of the sun, wind, and rain, frequently changing the surface thus exposed, by remelting it, and reducing it again to thin flakes. *Used* in making candles, and in white ointments, pommades, &c., for the sake of its colour. Block white wax (CERA ALBA IN MASSIS) is the above when cast into blocks; the best foreign is always in this forn. Virgin wax (CAKE WHITE WAX; CERA ALBA IN OFFIS) should be the last made into round flat cakes; but this is seldom the case, the mixture sold under the name generally containing from 1-3rd to 1-2nd its weight of spermaceti. The 'white wax' supplied by certain wholesale druggists to their customers is often totally unfit for the purposes to which it is applied. Spermaceti is constantly added to the white wax of commerce, to improve its colour. Mr. B. S. Proctor states that wholesale houses of the highest reputation supply an article, as white cake wax, which is in many cases half spermaceti, and in some as much as two thirds spermaceti to one of wax.[1]

WEIGHT. The quantity of a body determined by means of a balance, and expressed in terms having reference to some known standard; the measure of the force of gravity, from which the relative quantity of a body is inferred. The relation between the weight and volume of a body, compared to a given standard taken as unity, constitutes its specific gravity.

For the purpose of weighing, a balance or lever is required, which, when accurately suspended in a state of equilibrium, will be affected, in precisley an equal manner, by like weights applied to its extremities. Hence, the construction of such an instrument is not more difficult than its application is important in chemical and philosophical research. Oertling, the most celebrated maker of the chemical balance, constructs this important instrument in seven different varieties, more or less elaborate. The largest of these, with a 16-inch beam, will carry 2 lbs. in each pan, and yet turn with $\frac{1}{100}$th of a grain. A balance with arms of unequal length or weight will weigh as accurately as another of the same workmanship with equal arms, provided the substance weighed be removed and standard weights placed in the same scale until the equilibrium be again restored, when the weights so employed, being exactly in the same condition as the substance previously occupying the scale, will, of course, indicate its proper weight. A knowledge of this fact is useful, as it enables any one to weigh correctly with unequal scales, or with any suspended lever.

Small weights may be made of thin leaf brass, or, preferably, of platinum foil. Quantities below the 100th of a gr. may be either estimated by the position of the index, or shown by actually counting rings of wire, the value of which has been previously determined. The readiest way to subdivide small weights consists in weighing a certain quantity of very fine wire, and afterwards cutting it into such parts, by measure, as are desired; or the wire may be wrapped close round two pins, and then cut asunder with a knife. By this means it will be divided into a great number of equal lengths, or small rings.[2] The following Tables represent the values and relative proportions of the principal weights employed in Commerce and the Arts:—

I. English Weights.

1. *Imperial Avoirdupois Weight.*

Old Drachms	Drachm of the Ph. D. dr.	Ounces. oz.	Pounds. lb.	Quarters qr.	Hundred weight. cwt.	Ton.	Equiv. in Grains (*Troy*).	Equiv. in French grammes.	Equiv. in Minims or measured drops.
1·	·5	·0625	·0039	...	...	...	27·34375	1·7714	
2·	1·	·125	·0078	...	...	...	54·6875	3·5428	60·
16·	8·	1·	·0625	...	...	...	437·50	28·3424	480·
256·	128·	16·	1·	...	...	...	7000·	453·4784	7680·
7168·	3584·	448·	28·	1·	·25	...	196,000·		
28672·	14336·	1792·	112·	4·	1·	·05	784,000·		
573440·	286720·	35840·	2240·	80·	20·	1·	15,680,000·		

*** The standard in avoirdupois weight is the same as in troy weight. The old avoirdupois drachm is now never used, except in weighing silk; whenever a drachm is mentioned in commerce, the 1-8th of the avoird. oz. is intended, which, together with other divisions, is adopted in the Ph. D. In the new British Ph. the avoird. oz. and lb., with the ordinary grain, are the only denominations of weight adopted. The stone of butcher's meat is 8 lbs., and of other commodities 14 lbs., in London.

Avoird.
1 lb. = 1·21577 lb., or 1 lb. 2 oz. 4 drs. 40 grs. Troy.
1 oz. = ·9114583 oz., or 7 drs. 17·5 grs.
1 lb. distilled water (therm. 62°, barom. 30 in.) = 27·72740 cubic inches.
1 oz. „ „ = 1·73296 „
1 dr. „ „ = ·21662 „

†‡† Avoirdupois weight is distinguished in this work by the abbreviations referring to it being printed in *italics*.

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[1] See articles on "Adulteration of Wax," and "Substitutes for Wax," in 'Chemist and Druggist,' vol. iv, 1863.

[2] *An elaborate essay on the* Balance, in Watt's 'Dict. of Chemistry,' gives minute directions for weighing, with *rules for the elimination of errors.*

2. *Imperial Troy Weight.*

Grains. gr.	Pennyweights. dwt.	Ounces. oz.	Pound. lb. or ℔.
24	1		
480	20	1	
5760	240	12	1

⁎ The standard of the above measure is 1 cubic inch of distilled water, which, at 62° Fahr. and 30 inches of the barometer, weighs 252·458 troy grains.

The carat used in weighing diamonds is 3⅕ grains (nearly). Troy weight is employed in weighing gold, jewelry, &c., and, under a somewhat modified form, in prescribing and dispensing medicines. (See *below.*)

3. *Apothecaries' Weight.*

(Modified Troy Weight.)

Grains (*Troy*). gr.	Scruples. ℈	Drachms. ʒ	Ounces. ℥	Pounds. ℔	Equiv. in French grammes.	Equiv. in Minims or measured drops.	Equiv. in cubic inches.	Equiv. in Avoirdupois weight.
1·	·05	·01666	·002083	·0001736	·06475	1·09	·003961055	1· gr.
20·	1·	·3333	·0416	·003472	1·295	21·94	·07922109	20· „
60·	3·	1·	·1250	·0104166	3·885	65·82	·23766329	60· „
480·	24·	8·	1·	·0833333	31·08	526·62	1·90130635	1 oz. 42·5 „
5760·	288·	96·	12·	1·	372·96	6319·54	22·81567609	13 „ 72·5 „

⁎ Apothecaries' weight is employed in prescribing and dispensing medicines according to the Ph. L., E., and U. S. But in the last Ph. D. and the new Brit. Ph. it has been superseded by avoirdupois weight, as noticed above.

Troy.		*Avoirdupois.*
1 ℔	is equivalent to	0·822857 lb.
1 oz.	„	1·097143 oz.

II. French Weights.

1. *Metrical or Decimal Weights.*

Names.	Equiv. in Grammes.	Equiv. in Troy grains.	Equiv. in Avoirdupois weight.			Equiv. in Apothecaries' weight.			
			lb.	*oz.*	*gr.*	lb.	oz.	dr.	gr.
Milligramme . .	·001	·0154							
Centigramme . .	·01	·1543	...	...	...	...	...	...	...
Decigramme . .	·1	1·5434	...	...	...	...	...	...	1·5
Gramme . . .	1·	15·4340	...	...	...	...	...	...	15·4
Decagramme . .	10·	154·3402	...	0¼	45·	...	...	2	34·
Hectogramme . .	100·	1543·4023	...	3½	12·152	...	3	1	43·
Kilogramme or Kilo .	1000·	15434·0234	2	3¼	12·173	2	8	1	14·
Myriagramme . .	10000·	154340·2344	22	0¾	12·	26	9	4	20·

⁎ The standard unit in the above table is the gramme. A metrical *quintal* is 10 myriagrammes. A *millier* is 1000 kilos.

2. *Binary Weights.* (Système usuel.)

French grain.	Scrupule.	Gros.	Once.	Livre.	Kilogramme.	Equiv. in grammes métrique.	Round number of the Codex in grammes.	Equiv. in Avoirdupois weight.		
								lb.	*oz.*	*gr.*
1·	...	...	...	...	...	·0542	·05	...	...	0·837
24·	1·	...	...	...	...	1·30	1·30	...	...	20·1
72·	3·	1·	...	...	...	3·906	4·	...	...	60·284
576·	24·	8·	1·	...	...	31·25	32·	...	1	45·
9216·	384·	128·	16·	1·	...	500·	500·	1	1¼	61·
18432·	768·	256·	32·	2·	1·	1000·	1000·	2	3¼	13·

⁂ The old French grain is equal to ·820 of an imperial troy grain; hence 1 troy grain is equal to 1·21 old French grains. The gros, once, and other multiples of the grain, are, of course, proportionate. The new French grain (of 1812) is equal to ·0542 gramme, or ·8365228 gr. troy. It is said, in some works, to be equal to ·878 gr. troy, or, in round numbers, ·9, but this is much too high.

III. Continental Medicinal Weights, *in Troy Grains.*

(From Dr. Christison's 'Dispensatory.')

Country.	Pound.	Ounce.	Drachm.	Scruple consisting of		Grain.
				24 med. grs.	20 med. grs.	
French . . .	5670·5	470·50	59·10	19·7	...	0·820
Spanish . . .	5326·3	443·49	55·14	18·47	...	0·769
Tuscan . . .	5240·3	436·67	54·58	18·19	...	0·758
Roman . . .	5235·0	436·25	54·58	18·17	...	0·757
Austrian . . .	6495·1	541·25	67·65	...	22·5	1·127
German . . .	5524·8	460·40	57·55	...	19·18	0·960
Russian . . .	5524·8	460·40	57·55	...	19·18	0·960
Prussian . . .	5415·1	451·26	56·40	...	18·80	0·940
Dutch . . .	5695·8	474·64	59·33	...	19·78	0·988
Belgian . . .	5695·8	474·64	59·33	...	19·78	0·988
Swedish . . .	5500·2	458·34	57·29	...	19·09	0·954
Piedmontese . .	4744·7	395·39	49·45	...	16·48	0·824
Venetian . . .	4661·4	388·45	48·55	...	16·18	0·809

WELCH RARE'BIT. *Prep.* Cut slices of bread, toast and butter them; then cover them with slices of rich cheese, spread a little mustard over the cheese, put the bread in a cheese-toaster before the fire, and in a short time serve it up very hot.

WELD. *Syn.* WOALD. The *Reseda luteola* (Linn.), an herbaceous annual employed by the dyers. A decoction of the stems and leaves gives a rich yellow to goods mordanted with alum, tartar, or muriate of tin. See YELLOW PIGMENTS.

WEN. The popular name of pulpy encysted and fleshy tumours of the face and neck.

WHEAT. *Syn.* TRITICUM, L. The ripe seed or fruit of several varieties of *Triticum vulgare* (Linn.), of which the principal are *Triticum æstivum*, or spring wheat, *Triticum hybernum*, or winter wheat, and *Triticum turgidum*, or turgid wheat, the last two of which include several red and white sub-varieties. Of all the cereal grains, wheat appears to be that best adapted for bread corn, not merely on account of its highly nutritious character, *but also on account of the power it possesses,* from its richness in gluten, of forming a light and agreeable loaf by the process of fermentation.

According to Sir H. Davy, good English wheat contains of gluten, 19%; starch, 77%; soluble matter, 4 to 5%.

The average weight of good wheat per bushel is from 58 to 60 lbs.; and its average yield of flour is fully 12¼ lbs. for every 14 lbs. The weight of the straw is said to be about double that of the grain. The produce per acre varies from 12 to 60, or even 64, bushels an acre. See FLOUR, STARCH, &c.

Buckwheat. *Syn.* FAGOPYRUM. The seed of *Fagopyrum esculentum*, a plant of the natural order *Polygonaceæ*. It makes excellent cakes, crumpets, and gruel. In North America, buckwheat cakes, or rather fritters, are in general use at breakfast, eaten with molassen. In England, buckwheat is cultivated as food for pheasants.

Wheat, Indian. See MAIZE.

Wheat, Steeps for. Quicklime, sulphate of zinc, or white vitriol, sulphate of copper or blue vitriol, and arsenious acid or white arsenic, are the substances chiefly employed for this purpose. About 5 lbs. of the first (slaked and made into a milk with water), 1¼ lb. of the second, 1 lb. of the third, and 3 or 4 oz. of the last, are regarded as sufficient for each sack of seed. The method of applying them is either to dissolve or mix them with just sufficient water to cover the seed, which is then to be soaked in the mixture for a few hours, or a less quantity of water is employed, and the more concentrated solution is, at intervals, well sprinkled, by means of a "watering-pot," over the seed wheat spread upon the barn floor, the action being promoted by occasional stirring.

Obs. The first two substances above named have been separately proved to be amply sufficient to destroy the "smut" in seed wheat, and are perfectly harmless in their effects, which renders them greatly preferable to arsenic, or even to sulphate of copper. Nearly all the numerous advertised 'Anti-smuts,' or nostrums to prevent the smut in wheat, contain one or other of the last three of the above substances.

WHEY. *Syn.* SERUM LACTIS, L.; PETIT LAIT, Fr. The liquid portion of milk after the curd has been separated. It consists chiefly of water, holding in solution 3 or 4% of sugar of milk. A pound of milk, mixed with a tablespoonful of proof spirit, allowed to become sour, and the whey filtered from the sediment, yields, in the course of a few weeks, a good vinegar (whey vinegar), free from lactic acid (Scheele). Skimmed milk may be used.

Whey, Al'um. *Syn.* SERUM LACTIS ALUMINATUM, L. *Prep.* Take of powdered alum, 1 dr.; hot milk, 1 pint; simmer a few seconds, let it repose for a short time, and strain the whey from the coagulum. *Used* in diarrhœa, &c.; a wine-glassful after every motion. Acid whey (SERUM LACTIS ACIDUM) may be prepared in a similar manner, by substituting ½ dr. of tartaric or citric acid for the alum. Orange whey and lemon whey are prepared from the juice of the respective fruits, with a little of the yellow peel to impart flavour.

WHEY POWDER. *Prep.* 1. From whey gently evaporated to dryness, and powdered along with about 1-3rd of its weight of lump sugar.

2. Sugar, 7 oz.; sugar of milk, 2 oz.; gum arabic, 1 oz., (all in fine powder;) mix well. 1 oz. dissolved in 1¼ pint of water, forms extemporaneous whey.

WHIS'KEY. Dilute alcohol obtained from the fermented wort of malt or grain. That from the former is the most esteemed. The inferior qualities of this spirit are prepared from barley, oats, or rye, a small portion only of which is malted, or from potatoes mashed with a portion of barley malt, the resulting wash being carelessly fermented and distilled, and purposely suffered to burn, to impart the peculiar empyreumatic or smoky flavour so much relished by the lower orders of whiskey-drinkers. The malt whiskey (sold as such) of the principal Scotch and Irish distillers is fully equal in quality to London gin, from which it merely differs in flavour. The peculiar flavour of whiskey may be nicely imitated by adding a few drops each of pure creasote and purified fusel oil to 2 or 3 gallons of good London gin; and the imitation will be still more perfect if the liquor be kept for some months before drinking it. See GIN, SPIRITS, and USQUEBAUGH.

WHITE AR'SENIC. ARSENIOUS ACID.

WHITE-BAIT. The *Clupea Latulus* (*Clupea alba*—Yarrell), a very small and delicate fish, common in the brackish waters of the Thames from April to September. When fried in oil, it is esteemed a great luxury by epicures.

WHITE COPPER. See GERMAN SILVER and PACKTONG.

WHITE HEL'LEBORE. *Syn.* VERATRUM (Ph. L. & E.); VERATRI ALBI RADIX, L. "The rhizome of *Veratrum album*, Linn., or white hellebore." (Ph. L.) A powerful acrid cathartic, emetic, and sternutatory. It is now seldom exhibited internally, and its external use over a large or ulcerated service is not unaccompanied with danger.—*Dose.* ½ to 2 grs. of the powder, made into a pill; in gout, mania, &c.; or 1 to 3 grs., carefully triturated with 12 or 15 grs. of liquorice powder, as an errhine, in amaurosis, &c.

WHITE LEAD. See *below.*

WHITE PIG'MENTS. *Syn.* PIGMENTA ALBA, L. The following list embraces the more important white pigments of commerce:—

White, Alum. *Syn.* BAUMÉ'S WHITE. Take of powdered Roman alum, 2 lbs.; honey, 1 lb.; mix, dry, powder, calcine in a shallow dish to whiteness, cool, wash, and dry. A beautiful and permanent white, both in oil and water.

White, Derbyshire. From cawk or heavy spar, by grinding and elutriation.

White, Flake. The finer kinds of white lead are so called.

White, Min'eral. Precipitated carbonate of lead.

White, Newcastle. White lead made with molasses vinegar.

White, Nottingham. White lead made with alegar. Permanent white is now commonly sold for it.

White, Pearl. *Syn.* FARD'S SPANISH WHITE. Trisnitrate of bismuth.

White, Per'manent. Artificial sulphate of baryta, prepared by precipitating chloride of barium with dilute sulphuric acid, or a solution of glauber salts. A good fast white, unchanged by sulphurous fumes. *Used* to mark jars and bottles for containing acids or alkalies, as it is affected by very few substances; also to adulterate white lead.

White, Spanish. *Syn.* BLANC D'ESPAGNE, BLANC DE TROYES, Fr. The softest and purest white chalk, elutriated, made into balls, and well dried. *Used* as a cheap white paint.

WHITE LEAD. *Syn.* Fine white, Flake w., Carbonate of lead, Ceruse, Magistery of lead; Cerussa, Plumbi carbonas (B. P., Ph. E. & D.), L. Made by suspending rolls of thin sheet lead over malt vinegar, or pyroligneous acid, in close vessels, the evaporation from the acid being kept up by the vessels being placed in a heap of dung, or a steam bath.

Obs. Commercial carbonate of lead, however prepared, is not the pure carbonate of lead, but always contains a certain proportion of hydrate. It is generally largely adulterated with native sulphate of baryta ('heavy spar'), and sometimes with chalk. The former may be detected by its insolubility in dilute nitric acid, and the latter by the nitric solution yielding a white precipitate with dilute sulphuric acid, or a solution of oxalic acid or oxalate of ammonia, after having been treated with sulphuretted hydrogen, or a hydrosulphuret, to throw down the lead. "Pure carbonate of lead does not lose weight at a temperature of 212° Fahr.; 68 grs. are entirely dissolved in 150 minims of acetic acid diluted with 1 fl. oz. of distilled water; and the solution is not entirely precipitated by a solution of 60 grs. of phosphate of soda." (Ph. E.) The solution in nitric acid should not yield a precipitate when treated with a solution of sulphate of soda.—*Used* as a superior white paint, and, in medicine, as an external astringent, refrigerant, and desiccant. The particles of carbonate of lead prepared by precipitation, or by any of the quick processes, are in a somewhat crystalline and semi-translucent condition, and hence do not cover so well as that just noticed. The following are some of the varieties of 'white lead' found in commerce:—

1. (Dutch white lead.)—*a.* (Finest.) From flake white, 1 cwt.; cawk, 3 cwt.—*b.* (Ordinary.) Flake white, 1 cwt.; cawk, 7 cwt. These form the best white lead of the shops.

2. (English white lead.) Flake white lowered with chalk. Covers badly, and the colour is inferior to the preceding.

3. (French white lead; Blanc de plomb, Fr.) From litharge dissolved in vinegar, and the lead thrown down by a current of carbonic acid gas from coke. Does not cover so well as flake white.

4. (Grace's white lead.) Made from sheet lead, with the refuse water of the starch-maker's, soured brewer's grain, &c.

5. (Hamburg whit,e Hamburg white lead.) From flake white, 1 cwt.; cawk, 2 cwt. Also sold for best Dutch white lead.

6. (Venetian white, Venetian white lead; Cerusa Veneta, L.) From flake white, or pure white lead and cawk, equal parts. (See *below.*)

White Precip'itate of Lead. *Syn.* Miniature painter's white, Sulphate of lead. From an acetic or nitric solution of litharge, precipitated by adding dilute sulphuric acid, and the white powder washed and dried. The clear liquid decanted from the precipitate is poured on fresh litharge, when a second solution takes place; and this may be repeated for any number of times. *Used* in miniature painting, being a beautiful and durable white.

Whi''ting. The same as prepared chalk, but prepared more carelessly, in horse-mills.

White, Wilkinson's. From litharge ground with sea water until it ceases to whiten, and then washed and dried.

White, Zinc (Hubbuck's). A hydrated oxide of zinc. It possesses the advantage of being innocuous in use, and not being blackened by sulphuretted hydrogen, like white lead.

WHITE SWEL'LING. *Syn.* Hydrarthrus, L. A variety of indolent, malignant, scrofulous tumour, attacking the knee, ankle, wrist, and elbow, especially the first.

WHITES (Sharp). *Prep.* 1. From wheaten flour and powdered alum, equal parts, ground together.

2. (Stuff; Baker's stuff.) From alum, ground to the coarseness of common salt, 1 lb.; common salt, 3 lbs.; mix together. Both the above are used by bakers for the purpose of clandestinely introducing alum into their bread.

WHITE'WASH. Whiting is made into a milk with water, and a small quantity of melted size or dissolved glue added. It is applied to walls or ceilings with a broad, flat brush, worked in a uniform direction. Should the surface have been previously whitewashed, it is requisite first to remove the dirt by washing it with a brush and abundance of clean water.

"Lime-washing is, from the cleansing action of the quicklime, much the more effectual mode of purification, but is less frequently had recourse to, from the general ignorance respecting the proper mode of preparing the lime-wash. If glue is employed, it is destroyed by the corrosive action of the lime, and, in consequence, the latter easily rubs off the walls when dry. This is the case also if the lime be employed, as is often absurdly recommended, simply slaked in water, and used without any fixing material. Lime-wash is prepared by placing some freshly burned quicklime in a pail, and pouring on sufficient water to recover it; 'boiled oil' (linseed) should then be immediately added, in the proportion of a pint to a gallon of the wash. For coarser work, any common refuse fat may be used instead of the boiled oil. The whole should then be thinned with water to the required consistency, and applied with a brush. Care should be taken not to leave the brush in the lime-wash for any length of time, as it destroys the bristles." (W. B. Tegetmeier.)

WHI''TING. See White Pigments.

WHITING. The *Gadus merlangus* (Linn.), a member of the cod family of fishes. It is a very light and nutritious fish, and well adapted to dyspeptics and invalids; but it has too little flavour to be a favourite with gourmands.

WHIT'LOW. *Syn.* WHITLOE; PARONYCHIA, L. A painful inflammation, tending to suppuration and abscess, at the ends of the fingers, and mostly under or about the nails. Emollient poultices are useful in this affection; extreme tension and pain may be relieved by an incision, so as to allow the exit of the pus or matter from under the nail. The treatment must also be directed to establish the general health, as without this local remedies often fail.

WHOOP'ING-COUGH. *Syn.* CHIN-COUGH, HOOPING-C., KIN.-C.; PERTUSSIS, L. A convulsive strangling cough, characterised by peculiar sonorous or whooping inspirations, from which its popular name is taken. It comes on in fits, which are usually terminated by vomiting. It is infectious, chiefly attacks children, and, like the smallpox, only occurs once during life.

The treatment of whooping-cough consists, chiefly, in obviating irritation, and in exciting nausea and occasional vomiting. For the first, aperients and sedatives (hemlock or henbane), in small doses, may be given; for the second intention, an extremely weak sweetened solution of tartarized antimony, or a mixture containing squills or ipecacuanha, may be administered in small doses every hour or two, according to the effect produced. In full habits, blisters and leeches may be resorted to; and in all cases opiate and stimulating embrocations may be applied to the chest and spine with advantage. Whenever the head is affected, the use of narcotics is contra-indicated. The hot bath is often serviceable. "A mixture of cochineal and carbonate of potassa is by some regarded as almost a specific for this disease; but our own observations lead us to look with more favour on anatomical nauseants and emetics." (Cooley.) See ANTIMONIALS, DRAUGHT, MIXTURE, OXYMEL, SYRUP, WINES, &c.

WHOR'TLEBERRY (Bear's). *Syn.* UVÆ URSI FOLIA (B. P.), UVA URSI (Ph. L. E. & D.), L. The leaf of *Arctostaphylos Uva Ursi*, trailing arbutus, or bearberry. Astringent.—*Dose.* 10 to 30 grs. of the powder, thrice daily. See DECOCTION and EXTRACT.

WIK'ANA. *Syn.* WACAKA DES INDS, Fr. *Prep.* (Guibourt.) Roasted chocolate nuts (ground), 2 oz.; powdered cinnamon, 2 drs.; powdered vanilla, ½ dr.; ambergris, 3 grs.; musk, 1½ gr.; sugar, 6 oz.; well mixed together. A teaspoonful is boiled with ½ pint of milk, or arrow-root, as a stimulating diet for convalescents.

WILD CHERRY. The *Prunus Virginiana*, a beautiful tree, growing wild in the western states of America. The inner bark (wild-cherry bark) is officinal in the Ph. U. S., and is a valuable sedative tonic. It is specially adapted for the alleviation of the distressing cough which is so harassing to patients with pulmonary disease. See INFUSION.

WILD'FIRE RASH. Strophulus volaticus.

WILLOW. *Syn.* SALIX, L. The barks of *Salix alba* or white willow, *Salix fragilis* or crack willow, and *Salix Caprea* or great round-leaved willow (WILLOW BARK; SALICIS CORTICIS—Ph. E.), were officinal in the Ph. D. 1826; and, with that of *Salix Russelliana*, and other species, are rich in salicin, and hence possess considerable febrifuge power.—*Dose.* ½ to 1 dr., either in powder or made into a decoction; as a substitute for Peruvian bark, in agues, hectics, debility, dyspepsia, &c.

WIN'DOWS. A prismatic or crystalline appearance may be imparted to windows by several expedients:—

1. Mix a hot solution of sulphate of magnesia (Epsom salt) with a clear solution of gum arabic, and lay it on hot. For a margin, or for figures, wipe off the part you wish to remain clear with a wet towel as soon as the surface has become cold and hard. The effect is very pretty, and may be varied by substituting oxalic acid, red or yellow prussiate of potash, or any other salt (not efflorescent), for the sulphate of magnesia. Sulphate of copper gives a very beautiful crystallisation of a blue colour.

2. Evenly cover the surface of the glass with a layer of thin gum water, and sprinkle any of the saline crystals before noticed over it whilst wet. The gum water may be tinged of any colour to vary the effect.

A blinded appearance, more or less resembling ground glass, may be given as follows:—

1. By evenly dabbing the surface with a piece of soft glazier's putty.

2. A coating of stained rice jelly, laid on with a painter's brush (sash tool), and afterwards dabbed with a duster brush, applied endways.

3. Tissue paper, either white or coloured, applied by means of clear gum water or some pale varnish. The pattern may be lined with a pencil, and, when the whole is somewhat dry, but not hard, the lines may be cut through, and the pattern stripped off with the flat point of a knife.

4. The surface of the glass being coated with mucilage, or any pale varnish, as before, coarsely powdered glass or quartz, reduced to a uniform state of grain by a sieve, may be sprinkled over it; when dry, the loose portion should be removed with a soft brush.

WINE. *Syn.* VINUM, L.; VIN, Fr. The fermented juice of the grape. The general characters and quality of wine are principally influenced by climate, soil, and aspect, the nature and maturity of the grape, and the method of conducting the fermentation. The sp. gr. of the 'must' varies from 1·063 to 1·285, from which the proportion of saccharine matter and the ultimate alcoholic richness of the wine resulting from its fermentation may be inferred. That of Rhenish grapes seldom exceeds 1·095 to 1·100. Want of space compels us to confine our remarks chiefly to the properties, uses, and management of grape juice after it has passed through the stage of fermentation, or, in reality, become wine.

Officinal Wine. The only wine ordered by the British Colleges is sherry (WHITE WINE; VINUM XERICUM—B. P., Ph. L.; VINUM ALBUM—Ph. E.; VINUM HISPANICUM—Ph. D.); but several other wines are employed in medicine, as tonics, stimulants, antispasmodics, and restoratives, according to the circumstances of the case or the taste of the patient. In pharmacy, the less expensive Cape or marsala, or even raisin wine, is usually substituted for sherry in the preparation of the medicated wines of the Pharmacopœias.

Varieties, characteristics, &c. The following Tables will convey much useful information on this subject in a condensed form:—

1. TABLE *of the Quantity of Alcohol in Wine.* By Dr. CHRISTISON.

Names, &c.		Alcohol of ·7939 per cent. by weight.	Proof spirit per cent., by volume.
Port	Weakest	14·97	31·31
	Mean of 7 samples	16·20	34·91
	Strongest	17·10	37·27
	White	14·97	31·31
Sherry	Weakest	13·98	30·84
	Mean of 13 wines, excluding those very long kept in cask	15·37	33·59
	Strongest	16·17	35·12
	Mean of 9 wines long kept in cask in the East Indies	14·72	31·30
	Madre da Xeres	16·90	37·06
Madeira	Long kept in cask in the East Indies — Strongest	16·90	37·06
	Long kept in cask in the East Indies — Weakest	14·09	30·86
Teneriffe (long in cask at Calcutta)		13·84	30·21
Cercial		15·45	33·65
Lisbon (dry)		16·14	34·71
Shiraz		12·95	28·30
Amontillado		12·63	27·60
Claret. (A first growth of 1811)		7·72	16·95
Chateau-Latour. (Do. 1825)		7·78	17·06
Rosan. (Second growth of 1825)		7·61	16·74
Ordinary Claret. (Vin Ordinaire)		8·99	18·96
Rivesaltes		9·31	22·35
Malmsley		12·86	28·17
Rüdesheimer.	1st quality	8·40	18·44
„	Inferior	6·90	15·19
Hambacher.	Superior quality	7·35	16·15

II. *Quantity of Alcohol* (sp. gr. ·825[1] at 60° Fahr.) *in* 100 *parts of Wine by volume.*

Names of wine.	Alcoholic content.	Authority.
Alba Flora	17·26	Brande.
Barsac	13·86	do.
Bucellas	18·49	do.
Burgundy (average)	14·57	do.
Ditto	12·16	Prout.
Calcavella (average)	18·65	Brande.
Cape Madeira (do.)	20·51	do.
Cape Muschat	18·25	do.
Champagne (average)	12·61	do.
Ditto	12·20	Fontenelle.
Claret (average)	15·10	Brande.
Colares	19·75	do.
Constantia (White)	19·75	do.
Ditto (Red)	18·92	do.
Ditto (average)	14·50	Prout.
Côte Rôtie	12·32	Brande.
Currant	20·55	do.
Elder	8·79	do.
Frontignac (Rivesalte)	12·79	do.
Gooseberry	11·84	do.
Grape (English)	18·11	do.
Hermitage (Red)	12·32	do.
Ditto (White)	17·43	do.
Hock (average)	12·08	do.
Lachryma Christi	19·70	do.
Lisbon	18·94	do.
Lissa (average)	25·41	do.
Ditto (do.)	15·90	Prout.
Lunel	15·52	Brande.
Madeira (average)	22·27	do.
Ditto (do.)	21·20	Prout.
Malaga	17·26	Brande.
Ditto	18·94	do.
Malmsey Madeira	16·40	do.
Marsala (average)	25·09	do.
Ditto do.	18·40	Prout.
Nice	14·63	Brande.
Orange (average)	11·26	do.
Port (do.)	20·64	Prout.
Ditto (do.)	22·96	Brande.
Raisin (do.)	25·41	do.
Ditto (do.)	15·90	Prout.
Red Madeira (do.)	20·35	Brande.
Roussillon (do.)	18·13	do.
Sauterne	14·22	do.
Shiraz	15·52	do.
Sherry (average)	19·17	do.
Ditto (do.)	23·80	Prout.
Syracuse	20·00	do.
Ditto	15·28	Brande.
Teneriffe	19·79	do.
Tent	13·30	do.
Tokay	9·88	do.
Vidonia	19·25	do.
Vin de Grave	13·94	do.
Zante	17·05	do.

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[1] Alcohol of ·825 contains 92·6% of real or anhydrous alcohol; or, in the language of the Excise, is about [illegible] o.p. and in round numbers may be said to be of about twice the strength of brandy or rum, as usually sold.

Composition. The constituents of wine are —alcohol, which is one of its principal ingredients, and on which its power of producing intoxication depends; sugar, which has escaped the process of fermentation, and which is most abundant in the sweet wines, as tokay, tent, frontignac, &c.; extractive, derived chiefly from the husk of the grape, and is extracted from it by the newly formed alcohol; tartar, or bitartrate of potassa, which constitutes the most important portion of the saline matter of wine; odoriferous matter, imparting the characteristic vinous odour, depending chiefly upon the presence of œnanthic acid and ether; bouquet, arising from essential oil, or amyl-compounds, probably existing under the form of ethers. Besides these, small quantities of tannin, gum, acetic and malic acid, acetic ether, lime, &c., are found in wine. The specific gravity of wine depends on the richness and ripeness of the grapes used in its manufacture, the nature of the fermentation, and its age. It varies from about ·970 to 1·041.

Purity. The most frequent species of fraud in the wine trade is the mixing of wines of inferior quality with those of a superior grade. In many cases the inferior kinds of foreign wine are flavoured and substituted for the more expensive ones. This is commonly practised with Cape wine, which, after having a slight 'nuttiness' communicated to it by bitter almonds or peach kernels, a lusciousness or fulness by honey, and additional strength by a little plain spirit or pale brandy, is made to undergo the operation of 'fretting in,' and is then sold for 'sherry.' Formerly, it was a common practice of ignorant wine-dealers to add a little litharge or acetate of lead to their inferior wines to correct their acidity, but it is believed that this highly poisonous substance is now never employed in this country, 'salt of tartar' being made to perform the same duty. The lead which is frequently detected in bottled wine, and which often causes serious indisposition, may be generally traced to shot being carelessly left in the bottles, and not to wilful fraud. Sherry is commonly coloured, in Spain, by the addition of must boiled down to $\frac{1}{5}$ of its original volume; and in England, by burnt brown sugar, or spirit colouring. Amontillado (a very nutty wine) is frequently added to sherries deficient in flavour. Various other ingredients, as the essential oil of almonds, bitter almonds in substance, cherry-laurel leaves, cherry-laurel water, &c., are also employed for a like purpose. In Portugal, the juice of elderberries is very commonly added to port wine to increase its colour, and extract of rhatany for the double purpose of improving its colour and imparting an astringent taste. In England, beet-root, Brazil wood, the juices of elderberries and bilberries, the pressed cake of elder wine, extract of logwood, &c., are frequently added to port to deepen its colour; and oak sawdust, kino, alum, and extract of rhatany, to increase its astringency. But the most common adulterant of port wine, both in Portugal and this country, is 'jerupiga,' or 'geropiga,' a compound of elder juice, brown sugar, grape juice, and crude Portuguese brandy. That imported here contains about 45% of proof spirit, and is allowed by the Customs-house authorities to be mixed with port wine in bond. A factitious bouquet is also commonly given to wine by the addition of sweetbriar, orris root, clary, orange flowers, elder flowers, esprit de petit grain, &c.

Tests. These, for the most part, are applicable to all fermented liquors:—

1. Richness in alcohol. This may be found by any of the methods noticed under Alcoholmetry, Porter, and Tinctures.

2. Saccharine and extractive matter. The sp. gr. corresponding to the alcoholic strength, last found, is deducted, from the real sp. gr. of the sample, the difference divided by ·0025, or multiplied by 400, gives the weight of solid matter (chiefly sugar) in oz. per gallon (nearly).

3. Narcotics. These may be detected in the manner noticed at *page* 1109.

4. Lead. The presence of lead or litharge in wine may be readily detected by sulphuretted hydrogen, or a solution of any hydrosulphuret, which will, in that case, produce a black precipitate. See Wine-tests.

5. Potassa or soda improperly present. A portion of the wine is evaporated nearly to dryness, and then agitated with rectified spirit; the filtered tincture, holding in solution acetate of potassa, is then divided into two portions, one of which is tested for acetic acid, and the other for the alkali.

6. Alum. A portion of the wine is evaporated to dryness, and ignited; the residuum is then treated with a small quantity of hydrochloric acid, the mixture evaporated to dryness, again treated with dilute hydrochloric acid, and tested with liquor of potassa. If a white bulky precipitate forms, which is soluble in an excess of caustic potassa, and which is reprecipitated by a solution of sal ammoniac, the sample examined contained alum.

7. Oil of vitriol.—*a.* A drop or two of the suspected wine may be poured upon a piece of paper, which must then be dried before the fire. Pure wine at most only stains the paper, but one containing sulphuric acid causes it to become charred and rotten. The effect is more marked on paper which has been previously smeared with starch paste.

b. According to M. Lassaigne, pure red wine leaves, by spontaneous evaporation, a violet or purple stain on paper; whilst that to which sulphuric acid has been added, even in quantity only equal to $\frac{1}{1000}$ to $\frac{1}{2000}$th part, leaves a pink stain in drying.

8. Spurious colouring-matter.—*a.* Genu

ine red wines yield greenish-grey precipitates with sugar of lead, and greenish ones with potassa; but those coloured with elderberries, bilberries, litmus, logwood, and mulberries, give deep blue or violet precipitates, and those coloured with Brazil wood, red sanders wood, or red beet, give red ones.

b. Pure red wine is perfectly decoloured by agitation with recent hydrate of lime.

9. ARTIFICIAL FLAVOURING. This can only be detected by a discriminating and sensitive palate.

10. ARTIFICIAL BOUQUET. The substances added for this purpose may often be readily detected by a comparison of the sample with another of known purity.

Uses. The uses of wine as a beverage are too well known to require description. As a medicine, port wine is most esteemed as an astringent and tonic; and sherry and Madeira as stimulants and restoratives, in diseases where the acidity of the former would be objectionable; champagne is reputed diuretic and excitant, but its effects are not of long duration; and the Rhenish wines are regarded as refrigerant, diuretic, and slightly aperient. Claret, Rhenish, and Moselle wines are said to be the most wholesome. In *pharmacy*, wine is used as a menstruum.

MANAGEMENT OF WINE.

Age. The sparkling wines are in their prime in from 18 to 30 months after the vintage, depending on the cellaring and climate. Weak wines, of inferior growths, should be drunk within 12 or 15 months, and be preserved in a very cool cellar. Sound, well-fermented, full-bodied still wines are improved by age, within reasonable limits, provided they be well preserved from the air, and stored in a cool place, having a pretty uniform temperature. See *Maturation* (*below*).

Bottling. The secret of bottling wine with success consists in the simple exercise of care and cleanliness. The bottles should be all sound, clean, and dry, and perfectly free from the least mustiness or other odour. The corks should be of the best quality, and immediately before being placed in the bottles should be compressed by means of a 'cork-squeezer.' For superior or very delicate wines, the corks are usually prepared by placing them in a copper or tub, covering them with weights to keep them down, and then pouring over them boiling water holding a little pearlash in solution. In this state they are allowed to remain for 24 hours, when they are well stirred about in the liquor, drained, and re-immersed for a second 24 hours in hot water, after which they are well washed and soaked in several successive portions of clean and warm rain water, drained, dried out of contact with dust, put into paper bags, and hung up in a dry place for use. The wine should be clear and brilliant, and if it be not so, it must undergo the process of 'fining' before being bottled. In fact, it is a common practice with some persons to perform this operation whether the wine require it or not; as, if it has been mixed and doctored, it "amalgamates and ameliorates the various flavours." The bottles, corks, and wine, being ready, a fine clear day should be preferably chosen for the bottling, and the utmost cleanliness and care should be exercised during the process. Great caution should also be observed to avoid shaking the cask so as to disturb the 'bottoms.' The remaining portion that cannot be drawn off clear should be passed through the 'wine-bag,' and, when bottled, should be set apart as inferior to the rest. The coopers, to prevent breakage and loss, place each bottle, before corking it, in a small bucket having a bottom made of soft cork, and which is strapped on the knee of the bottler. They thus seldom break a bottle, though they 'flog' in the corks very hard. When the process is complete, the bottles of wine are stored in a cool cellar, and on no account upright, or in damp straw, but on their sides, in sweet, dry sawdust or sand.

Bouquet. See *Flavouring* and *Perfuming.*

Brandying. Brandy is frequently added to weak or vapid wines, to increase their strength, or to promote their preservation. In Portugal, one third of brandy is commonly added to port before shipping it for England, as without this addition it generally passes into the acetous fermentation during the voyage. A little good brandy is also usually added to sherry before it leaves Spain. By the regulations of the Customs of England, 10% of brandy may be added to wines in bond, and the increased quantity is only charged the usual duty on wine. The addition of brandy to wine injures its proper flavour, and hence it is chiefly made to port, sherry, and other wines, whose flavour is so strong as not to be easily injured. Even when brandy is added to wines of the latter description, they require to be kept for some time to recover their natural flavour. To promote this object, the wine-doctors employ the process called 'fretting in,' by which they effect the same change in 3 or 4 weeks, as would otherwise require some months, at the very least.

Cellaring. A wine-cellar should be dry at bottom, and either covered with good hard gravel or be paved with flags. Its gratings or windows should open toward the north, and it should be sunk sufficiently below the surface to ensure an equable temperature. It should also be sufficiently removed from any public thoroughfare, so as not to suffer vibration from the passing of carriages. Should it not be in a position to maintain a regular temperature, arrangements should be made to apply artificial heat in winter, and proper ventilation in summer.

Colouring. Wines are as commonly doctored in their colour as their flavour. A fawn-yellow and golden-sherry yellow are given by means of tincture or infusion of saffron, turmeric, or safflower, followed by a little spirit colouring, to prevent the colour being too lively. All shades of amber and fawn, to deep brown and brandy colour, are given by burnt sugar. Cochineal (either alone or with a little alum) gives a pink colour; beet-root and red sanders give a red colour; the extracts of rhatany and logwood, and the juice of elderberries, bilberries, &c., give a port-wine colour.

Crusting. To make port wine form a crust on the inside of the bottles, a spoonful of powdered catechu, or ½ a spoonful of finely-powdered cream of tartar, is added to each bottle before corking it, after which the whole is well agitated. It is also a common practice to put the crust on the bottle before putting the wine into it, by employing a hot saturated solution of red tartar, thickened with gum and some powdered tartar.

Deacetification. This is effected by the cautious addition of either salt of tartar or carbonate of soda. Wine so treated soon gets insipid by exposure and age; and, without care, the colour of red wines is thus frequently spoiled.

Deacidification. See *Detartarization* (*below*).

Decanting. This only refers to small quantities of wine, ready for consumption. In decanting wine, care must be taken not to shake or disturb the crust when moving it about or drawing the cork, particularly of port wine. Never decant wine without a wine-strainer, with some clean fine cambric in it, to prevent the crust and bits of cork going into the decanter. In decanting port wine, do not drain it too close; as there are generally two thirds of a wine-glassful of thick dregs in each bottle, which ought to be rejected. In white wine there is not much settling; but it should nevertheless be poured off very slowly, the bottle being raised gradually.

Decolouring. The colour of wine is precipitated by age and by exposure to the light. It is also artificially removed by the action of skimmed milk, lime water, milk of lime, and fresh burnt charcoal. Wine merchants avail themselves of this property for the purpose of whitening wines that have acquired a brown colour from the cask, or which are esteemed pale; and also for turning 'pricked' red or dark-coloured wines into white wines, in which a small degree of acidity is not so much perceived. In this way brown sherry is commonly converted into pale or gold-coloured sherry. For the latter purpose, 2 to 3 pints of skimmed milk are usually sufficient; but to decolour red wine 2 to 3 quarts or more will be required, according to the nature and intensity of the colour, or the shades of paleness desired. Charcoal is seldom used, as it removes the flavour as well as colour, but a little milk of lime may sometimes be advantageously substituted for milk, when the wine has much acidity, more particularly for red wines, which may even be rendered quite colourless by it.

Detartarization. Rhenish wines, even of the most propitious growths, and in the best condition, besides their tartar, contain a certain quantity of free tartaric acid, on the presence of which many of their leading properties depend. The excess of tartar is gradually deposited during the first years of the vatting, the sides of the vessels becoming more and more encrusted with it; but, owing to the continual addition of new wine, and other causes, the liquid often gains such an excess of free tartaric acid, as to acquire the faculty of redissolving the deposited tartar, which thus again disappears after a certain period. The taste and flavour of the wine are thus exalted, but the excess of acid makes the wine less agreeable in use, and probably less wholesome. Amateurs and manufacturers should therefore welcome a means of taking away the free tartaric acid, without altering, in any respect, the quality of the wine. This is pure neutral tartrate of potash. When this salt, in concentrated solution, is added to such a fluid as the above, the free acid combines with the neutral salt, and separates from the liquid under the form of the sparingly soluble bitartrate of potash. "If to 100 parts of a wine which contains one part of free tartaric acid, we add 1¼ part of neutral tartrate of potash, there will separate on repose, at 70 to 75° Fahr., 2 parts of crystallised tartar; and the wine will then contain only ¼ part of tartar dissolved, in which there are only ·2 part of the original free acid; ·8 part of the original free acid having been withdrawn from the wine." (Liebig's 'Annalen.') This method is particularly applicable to recent must and to wines which do not contain much free acetic acid; but when this last is the case, so much acetate of potash is formed as occasionally to vitiate the taste of the liquor.

Fining. Wine is clarified in a similar manner to beer. White wines are usually fined by isinglass, in the proportion of about 1½ oz. (dissolved in 1½ pint of water, and thinned with some of the wine) to the hogshead. Red wines are generally fined with the whites of eggs, in the proportion of 15 to 20 to the pipe. Sometimes hartshorn shavings, or pale sweet glue, is substituted for isinglass.

Flatness. This is removed by the addition of a little new brisk wine of the same kind; or by rousing in 2 or 3 lbs. of honey; or by adding 5 or 6 lbs. of bruised sultana raisins, and 3 or 4 quarts of good brandy, per hogshead. By this treatment the wine will usually be recovered in about a fortnight, except in very cold weather. Should it be wanted sooner, a table-spoonful or two of yeast may be added, and the cask removed to a warmer situation.

Flavouring. Various ingredients are added to inferior wines, to give them the flavour of others more expensive, and to British wines, to make them resemble those imported. Substances are also added in a similar manner to communicate the aroma of the high-flavoured grape wines. Among the first are bitter almonds, almond cake, or the essential oil of almonds, or, preferably, its alcoholic solution, which are used to impart a 'sherry' or 'nutty' taste to weak-flavoured wines, as poor sherry, white cape, and malt, raisin, parsnip, and other similar British wines; rhatany, kino, oak sawdust and bark, alum, &c., to convey astringency, and—tincture of the seeds of raisins, to impart a 'port wine' flavour. Among the substances employed to communicate the bouquet of the finer wines, may be mentioned—orris root, eau de fleurs d'oranges, neroli, essence de petit grain, ambergris, vanilla, violet petals, essence of cedrat, sweet briar, clary, and elder flowers, quinces, cherry-laurel water, &c. By the skilful, though fraudulent, use of the above flavouring substances and perfumes, the experienced wine-brewer manages to produce, in the dark cellars of London, from white cape, currant gooseberry, raisin, rhubarb, parsnip, and malt wine, very excellent imitations of foreign wine, and which pass current among the majority of English wine-drinkers as the choicest productions of the grape, "genuine as imported."—A grain or two of ambergris, well rubbed down with sugar, and added to a hogshead of claret, gives it a flavour and bouquet much esteemed by some connoisseurs.

Fretting-in. See *Sweating-in* (*below*).

Improving. This is the cant term of the wine trade, under which all the adulteration and 'doctoring' of wine is carried on. A poor sherry is improved by the addition of a little almond flavour, honey, and spirit; a port deficient in body and astringency, by the addition of some red tartar (dissolved in boiling water), some rhatany, kino, or catechu, and a little honey or foots, and brandy. See *Mixing* (*below*).

Insensible Fermentation. See *Maturation* (*below*).

Insipidity. See *Flatness* (*above*).

Maturation. The natural maturation or 'ripening' of wine and beer by age depends upon the slow conversion of the sugar which escaped decomposition in the 'gyle tun,' or fermenting vessel, into alcohol. This conversion proceeds most perfectly in vessels which entirely exclude the air, as in the case of wine in bottles; as when air is present, and the temperature sufficiently high, it is accompanied by slow acetification. This is the case of wine in casks, the porosity of the wood allowing the very gradual permeation of the air. Hence the superiority of bottled wine over draught wine, or that which has matured in wood. Good wine, or well-fermented beer, is vastly improved by age when properly preserved; but inferior liquor, or even superior liquor, when preserved in improper vessels or situations, becomes acidulous, from the conversion of its alcohol into vinegar. Tartness or acidity is consequently very generally, though wrongly, regarded by the ignorant as a sign of age in liquor. The peculiar change by which fermented liquors become mature or ripe by age is termed the 'insensible fermentation.' It is the alcoholic fermentation impeded by the presence of the already formed spirit in the liquor, and by the lowness of the temperature. See *Ripening* (*below*).

Mixing. Few wines are sold without admixture. It is found that the intoxicating properties of wine are increased by mixing them with other wines of a different age and growth. In many cases the flavour is at the same time improved. Thus, a thin port is improved by the addition of a similar wine having a full body, or by a little Malaga, Teneriffe, or rich sherry; and an inferior old sherry may be improved by admixture with a little full-bodied wine of the last vintage. In this consists the great art of 'cellar management,' and to such an extent is this carried, both abroad and in England, that it may be confidently asserted that few wines ever reach the consumer in an unmixed or natural state.

Mustiness. This may generally be removed by violently agitating the wine for some time with a little of the sweetest olive or almond oil. The cause of the bad taste is the presence of an essential oil, which the fixed oil seizes on, and rises with to the surface, when it may be skimmed off; or the liquor under it may be drawn off. A little coarsely powdered fresh-burnt charcoal, or even some slices of bread toasted black, will frequently have a like effect. A little bruised mustard seed is also occasionally used for the same purpose.

Perfuming. This is chiefly performed on British wines for family use. For its application to foreign wine, see Flavouring (*above*). Wines may be perfumed by the simple addition of any odorous substances previously well mixed with a little of the wine, or dissolved in a few fl. oz. of rectified spirit.

Racking. This should be performed in cool weather, and preferably early in the spring. A clean syphon, well managed, answers better for this purpose than a cock or faucet. The bottoms, or foul portion, may be strained through a wine-bag, and added to some other inferior wine.

Ripening. To promote the maturation or ripening of wine, various plans are adopted by the growers and dealers. One of the safest ways of hastening this, especially for strong wines, is not to rack them until they have stood 15 or 18 months upon the lees; or, whether 'crude' or 'racked,' keeeping them at a temperature ranging between 50 and 60° Fahr., in a cellar free from draughts and not too dry. Another method is to remove the corks or bungs, and to substitute bladder tied or fastened air-tight over the openings. Bottled wine, treated in this way, ripens very quickly in a temperate situation. Some dealers add a little dilute sulphuric acid to the coarser wines for the same purpose; but a small quantity of concentrated acetic acid or tartaric acid would be preferable, since these acids are found in all wines. 4 or 5 drops of the former, added to a bottle of some kinds of new wine, immediately give it the appearance of being 2 or 3 years old.

Ropiness, viscidity; Graisse. This arises from the wine containing too little tannin or astringent matter to precipitate the gluten, albumen, or other azotised substance, occasioning the malady. Such wine cannot be clarified in the ordinary way, because it is incapable of causing the coagulation or precipitation of the finings. The remedy is to supply the principle in which it is deficient. M. François, of Nantes, prescribes the bruised berries of the mountain ash (1 lb. to the barrel) for this purpose. A little catechu, kino, or, better still, rhatany, or the bruised footstalks of the grape, may also be conveniently and advantageously used in the same way. For pale white wines, which are the ones chiefly attacked by the malady, nothing equals a little pure tannin or tannic acid dissolved in proof spirit. See VISCOUS FERMENTATION, MALT LIQUORS, &c.

Roughening. See Flavouring (*above*).

Second fermentation; La-pousse. Inordinate fermentation, either primary or secondary, in wine or any other fermented liquor, may be readily checked by sulphuration, or by the addition of mustard seed or sulphite of lime. I oz. of brimstone, ¾ to 1 lb. of bruised mustard seed, and about 4 to 8 oz. of sulphite of lime, are fully sufficient for a hogshead. This substance seldom fails of arresting the fermentation.—In addition to the above remedies, a little sulphuric acid is sometimes employed, and the use of black oxide of manganese, or chlorate of potash, has been proposed on theoretical grounds.

Souring. This is either occasioned by the wine having been imperfectly fermented, or from its having been kept in too warm a cellar, where it has been exposed to draughts of air or to continual vibrations, occasioned by the passage of loaded vehicles through the adjoining thoroughfare. The remedy commonly recommended in books for this purpose is to saturate the acid with chalk, milk of lime, or calcined oyster shells; but such additions, made in sufficient quantity to effect this object, destroy the character of the wine, and render it sickly and vapid. The best and only safe remedy is a little neutral tartrate of potash, cautiously added; or it may be mixed with a considerable portion of full-bodied new wine of its class, adding at the same time a little brandy, and in 2 or 3 weeks fining it down, when it should be either at once put into bottles, or consumed as soon as possible. See *Deacetification* and *Detartarisation* (*above*).

Sparkling, creaming, and briskness. These properties are conveyed to wine by racking it into closed vessels before the fermentation is complete, and while there still remains a considerable portion of undecomposed sugar. Wine of this description, which has lost its briskness, may be restored by adding to each bottle a few grains of white lump sugar or sugar candy. This is the way in which champagne is treated in France. The bottles are afterwards inverted, by which means any sediment that forms falls into the necks, when the corks are partially withdrawn, and the sediment is immediately expelled by the elastic force of the compressed carbonic acid. If the wine remains muddy, a little solution of sugar and finings are added, and the bottles are again placed in a vertical position, and, after two or three months, the sediment is discharged, as before.

Sweating-in. The technical terms 'sweating-in' and 'fretting in' are applied to the partial production of a second fermentation, for the purpose of mellowing down the flavour of foreign ingredients (chiefly brandy), added to wine. For this purpose 4 or 5 lbs. of sugar or honey, with a little crude tartar (dissolved), are commonly added per hogshead; and when the wine is wanted in haste, a spoonful or two of yeast, or a few bruised vine leaves, are also mixed in, the cask being placed in a moderately warm situation until the new fermentation is established, when it is removed to the wine cellar, and, after a few days, 'fined down.'

Taste of cask. The remedies for this malady are the same as those for mustiness.

⁂ For further information connected with the nature and management of wines, and other fermented liquors, see BREWING, FERMENTATION, MALT LIQUORS, PORTER, SUGAR, SYRUP, VINOUS FERMENTATION, VISCOUS F., WORT, YEAST, &c., and *below*.

Wine, British. The various processes in British wine-making depend upon the same principles, and resemble those employed for foreign wine.

The FRUIT should be preferably gathered in fine weather, and not until mature, as evinced by its flavour; for if it be employed whilst unripe, the resulting wine will be harsh, disagreeable, and unwholesome, and a larger quantity of sugar and spirit will be required to render it palatable. The common practice of employing unripe gooseberries for the manufacture of British champagne, arises from a total ignorance of the scientific principles of wine-making. On the other hand, if ordinary British fruit be employed in too ripe a state, the wine is apt to be inferior, and deficient in the flavour of the fruit.

The FRUIT, being gathered, at once undergoes the operation of picking or garbling, for the purpose of removing the stalks and unripe or damaged portions. It is next placed in a tub, and is well bruised, to facilitate the solvent action of the water. Raisins are commonly permitted to soak about 24 hours previously to bruising them, but they may be advantageously bruised or minced in the dry state. The bruised fruit is then put into a vat or vessel with a guard placed over the tap-hole, to keep back the husks and seeds of the fruit when the must, juice, or extract, is drawn off. The water is now added, and the whole is allowed to macerate for 30 or 40 hours, more or less, during which time the magma is frequently roused up with a suitable wooden stirrer. The liquid portion is next drawn off, and the residuary pulp is placed in hair bags, and undergoes the operation of pressing, to expel the fluid which it contains. The sugar, tartar (in very fine powder, or in solution), &c., are now added to the mixed liquors, and the whole is well stirred or 'rummaged' up for some time. The temperature being suitable, the vinous fermentation soon commences, when the liquor is frequently skimmed (if necessary), and well 'roused' up, and, after 3 or 4 days of this treatment, it is run into casks, which should be quite filled, and left purging at the bung-hole. In about a week the flavouring ingredients, in the state of coarse powder, are commonly added, and well stirred in; and in about another week, depending upon the state of the fermentation, and the attenuation of the must, the brandy or spirit is added, and the cask is filled up, and bunged down close. In four or five weeks more the cask is again filled up, and, after some weeks (the longer the better), it is 'pegged' or 'spiled,' to ascertain if it be fine or transparent; if so, it undergoes the operation of racking; but if, on the contrary, it still continues muddy, it must be either again bunged up, and allowed to repose for a few weeks longer, or it must pass through the process of fining. Its future treatment is similar to that already noticed under FOREIGN WINE. (See *above*.)

The must of many of the strong-flavoured fruits, as black currants, mulberries, &c., is improved by being boiled before being made into wine. The flavour and bouquet of the more delicate fruits are either greatly diminished or utterly dissipated by boiling.

General Formulæ for the *Preparation* of BRITISH WINES:—

1. From ripe saccharine fruits. Take of the ripe fruit, 4 to 6 lbs.; clear soft water, 1 gal.; sugar, 3 to 5 lbs.; cream of tartar (dissolved in boiling water), 1¼ oz.; brandy, 2 to 3% flavouring, as required. If the full proportions of fruit and sugar are used, the product will be good without the brandy, but better with it. 1¼ lb. of raisins may be substituted for each pound of sugar.

In the above way are made the following wines:—Gooseberry wine ('British champagne');—currant wine (red, white, or black);—mixed fruit wine (currants and gooseberries, or black, red, and white currants, ripe black-heart cherries, and raspberries, equal part), a good family wine;—cherry wine;—colepress's wine (from apples and mulberries, equal part); elder wine;—strawberry wine;—raspberry wine;—mulberry wine (when flavoured, makes 'British port');—whortleberry wine (bilberry wine), makes a good factitious 'port';—blackberry wine;—damson wine (makes good factitious 'port');—morella wine; apricot wine;—apple wine; grape wine, &c.

2. From dry saccharine fruit (as raisins). Take of the dried fruit, 4½ to 7½ lbs.; clear soft water, 1 gal.; cream of tartar (dissolved), 1 oz.; brandy, 1½ to 4%. Should the dried fruit employed be at all deficient in saccharine matter, 2 to 3 lbs. of it may be omitted, and half that quantity of sugar, or two thirds of raisins, added. In the above way are made—date wine,—fig wine,—raisin wine, &c.

3. From ACIDULOUS, ASTRINGENT, or SCARCELY RIPE FRUITS, or those which are deficient in saccharine matter. Take of the picked fruit, 2½ to 3½ lbs.; sugar, 3½ to 5½ lbs.; cream of tartar (dissolved), ½ oz.; water, 1 gal.; brandy, 2 to 6%.

In the above way are made—gooseberry wine ('British champagne');—bullace wine (which makes an excellent factitious 'port');—damson wine, &c.

4. From FOOTSTALKS, LEAVES, CUTTINGS, &c. By infusing them in water, in the proportion of 3 to 6 lbs. to the gal., or q. s. to give a proper flavour, or to form a good saccharine liquor; and adding 2½ to 4 lbs. of sugar to each gal. of the strained liquor. 1¼ lb. of raisins may be substituted for each lb. of sugar.

In the above way are made—rape wine (from the pressed cake of grapes);—English grape wine;—rhubarb wine ('Bath champagne,' 'patent c.'), from garden rhubarb;—celery wine, &c.

5. From SACCHARINE ROOTS and STEMS OF PLANTS. Take of the bruised, rasped, or sliced vegetable, 4 to 6 lbs.; boiling water, 1 gal.; infuse until cold, press out the liquor, and to each gal. add, of sugar, 3 to 4 lbs.; cream of tartar, 1 oz.; brandy, 2 to 5%. For some roots and stems the water must not be very hot, as they are thus rendered troublesome to press.

In the above way are made—beet-root wine ('British Roussillon');—parsnip wine ('British malmsey');—turnip w., &c.

6. From FLOWERS, SPICES, AROMATICS, &c. These are prepared by simply infusing a sufficient quantity of the bruised ingredient for a few days in any simple wine (as that from sugar, honey, raisins, &c.) after the active fermentation is complete, or, at all events, a few weeks before racking them.

In the above way are made—clary wine ('muscadel'), from flowers, 1 quart to the gal.);—cowslip wine (flowers, 2 quarts to the gal.);—elder-flower wine ('Frontignac'), flowers of white-berried elder, ½ pint, and lemon juice, 3 fl. oz., to the gal.;—ginger wine (1½ oz. of ginger to the gal.;—orange wine (1 dozen sliced oranges per gal.)—lemon wine (juice of 12 and rinds of 6 lemons to the gal.);—spruce wine (½ oz. of essence of spruce per gal.);—juniper wine (berries, ¾ pint per gal.);—peach wine (4 or 5 sliced, and the stones broken, to the gal.);—apricot wine (as peach wine, or with more fruit);—quince wine (12 to the gal.); rose clove-gillyflower, carnation, lavender, violet, primrose, and other flower wines (distilled water, 1½ pint, or flowers, 1 pint, to the gal.);—balm wine (balm tops, 4 oz. per gal.); &c.

7. From **saccharine juices**, or **infusions**, or from fermented liquors. Take of the juice or liquor, 1 gal.; honey or sugar, 2 to 3 lbs. (or raisins, 3 to 5 lbs.); cream of tartar, 1½ oz.; brandy, 2 to 4%.

In this way are made—English grape wine;—mixed fruit wine;—pine-apple wine;—cider wine;—elder wine;—birch wine (from the sap, at the end of February or beginning of March); sycamore wine (from the sap);—malt wine ('English Madeira'), from strong wort;—and the wines of any of the saccharine juices of ripe fruit.

8. From **simple saccharine matter**. Take of sugar, 3 to 4 lbs.; cream of tartar, ½ oz.; water, 1 gal.; honey, 1 lb.; brandy, 2 to 4%. A handful of grape leaves or cuttings, bruised, or a pint of good malt wort, or mild ale, may be substituted for the honey. Chiefly *used* as the basis for other wines, as it has little flavour of its own; but makes a good 'British champagne.'

Obs. In all the preceding formulæ lump sugar is intended when the wines are required very pale, and good Muscovado sugar when this is not the case. Some of the preceding wines are vastly improved by substituting good cider, perry, or pale ale or malt wort, for the whole or a portion of the water. Good porter may also be advantageously used in this way for some of the deep-coloured red wines. When expense is no object, and very strong wines are wanted, the expressed juices of the ripe fruits, with the addition of 3 or 4 lbs. of sugar per gal., may be substituted for the fruit in substance, and the water.

Examples of **British imitations** of **foreign wines**:—

American honey wine. From good honey, 21 lbs.; cider, 12 galls.; ferment, then add, of rum, 5 pints; brandy, 2 quarts; red or white tartar (dissolved), 6 oz.; bitter almonds and cloves, of each, bruised, ½ oz.; powdered capsicum, 3 drs. This is also called 'mead wine.' With the addition of 3 oz. of unbleached Jamaica ginger (finely grated), it forms the best American ginger wine.

British Burgundy. By adding a little lemon juice, and a 'streak' of orris or orange-flower water, to 'British port,' the ingenious *wine-brewer converts it* into 'British Burgundy.' It is also made by mixing together equal parts of 'British port' and claret.

British cape. 1. (White.) Raisin wine, well attenuated by fermentation, either alone or worked up with a little cider and pale malt wort.

2. (Red.) British white cape, sound rough cider, and mulberry wine, equal parts; well mixed, and fined down.

British champagne. 1. From stoned raisins, 7 lbs.; loaf sugar, 21 lbs.; water, 9 galls.; crystallised tartaric acid, 1 oz.; cream of tartar, ¼ oz.; Narbonne honey, 1 lb.; sweet yeast, ½ pint; ferment, skimming frequently, and, when the fermentation is nearly over, add, of coarsely powdered, orris root, 1 dr.; eau de fleurs d'oranges, ½ pint; and lemon juice, 1 pint; in 3 months fine it down with isinglass, ½ oz.; in 1 month more, if not sparkling, again fine it down, and in another fortnight bottle it, observing to put a piece of double-refined white sugar, the size of a pea, into each bottle; lastly, wire down the corks, and cover them with tin-foil, after the manner of champagne.

2. As the preceding, but substituting 32 lbs. of double-refined sugar for the sugar and raisins therein ordered, with the addition of 3 galls. of rich pale-coloured brandy.

3. From amber hairy champagne gooseberries, English grape juice, or the stalks of garden rhubarb, and lump sugar; with a little sweetbriar, orris, or orange-flower water, to impart a slight bouquet. The last forms what is known as 'patent' or 'Bath champagne.'

4. (Pink.) To either of the preceding add red currant juice, q. s. to colour; or 1 oz. of coarsely powdered cochineal to each 10 or 12 galls. at the time of racking.

Obs. It is notorious that two bottles of wine out of every three sold for 'genuine champagne' in England is of British manufacture. "We have ourselves seen sparkling gooseberry, rhubarb, and white sugar wines, sold for imported champagne, at 7s. 6d. per bottle, and the fraud has passed undetected, even by habitual wine drinkers." (Cooley.)

British claret. 1. Rich old cider or perry and port wine, equal parts.

2. To each gal. of the last add of cream of tartar (genuine), 3 drs., with the juice of 1 lemon. Sometimes ½ pint of French brandy is also added.

Obs. If these mixtures are well fined down, and not bottled for at least a month or 5 weeks, they closely resemble good 'Bordeaux.' A mixture of 4 parts of raisin wine, with 1 part each of raspberry and barberry or damson wine also forms, when so treated, an excellent factitious 'claret.'

British Cyprus. From the juice of white elderberries, 1 quart, and Lisbon sugar, 4 lbs., to water, 1 gal.; together with ½ dr. each of bruised ginger and cloves. When racked, add minced raisins and brandy, of each, 2 oz.

British hock, British red hock. From cream of tartar, 1½ oz.; tartaric acid, ½ oz.; (both in extremely fine powder;) juices of the purple plum, ripe apples, and red beet, of each (warmed), 6 pints; lemon juice, 1 pint; with white sugar, 2½ lbs. per gal.

British Madeira. From very strong pale malt wort, 36 galls., sugar candy, 28 lbs., and cream of tartar, 3 oz.; fermented with yeast, 2 lbs., adding, when the fermentation is nearly finished, raisin wine, 2½ galls.; brandy and sherry wine, of each, 2 galls.; rum and brandy, of each, 3 pints; after 6 or 9 months, fine it down, and in another month bottle it. See British sherry (*below*).

British malmsey. From sliced or grated parsnips, 4 lbs., boiling water, 1 gal.; when cold, press out the liquor, and to each gallon add of cream of tartar, ½ oz., and good Muscovado sugar, 3 lbs., ferment, rack, and add of brandy, 3 to 5%. Good Malaga raisins may be substituted for the sugar.

British sparkling Moselle. From rich cider apples (carefully peeled and garbled), pressed with 1 4th of their weight of white magnum bonum plums (previously stoned), and the must fermented with 2½ lbs. of double-refined sugar per gal., as champagne.

British red Moselle. The last coloured with [illegible] elderberry juice.

British muscadel. As British sparkling Moselle, with some [illegible] of the [illegible] flavour [illegible].

[illegible]

by way of bouquet; but care must be taken not to overdo it.

2. To each gallon of strong raisin must, add, when racking, 1 Seville orange, and 3 or 4 bitter almonds, both sliced. By omitting the almonds, and adding 1 green citron to each 2 or 3 gallons, this forms 'British Madeira.'

3. Very strong pale malt wort, 36 galls.; finest Muscovado sugar, 1 cwt.; yeast, 1 pint; ferment; on the third day add of raisins, stoned, 14 lbs., and in another week add of rectified spirit, 1 gal., rum, ½ gal., and bitter almonds, grated, 1½ oz.; bung down for 4 months, then draw it off into another cask, add of brandy, 1 gal., and in 3 months bottle it.

4. Teneriffe, slightly flavoured with cherry-laurel or bitter almonds, forms an excellent 'British sherry,' either alone or mixed with an equal quantity of cape or raisin wine or good perry.

British tokay. To good raisin wine, 18 galls.; add of elderberry juice, [illegible] sugar, 14 lbs.; red argol, powdered, [illegible] crystallised tartaric acid, 3 oz. [illegible] ferment, and when the active fermentation is [illegible] add of brandy, 1 gal., and [illegible]

[illegible]

but the use of wine (sherry) was restored in that of 1836. The druggists commonly use cape or raisin wine as a menstruum, from its being cheaper than sherry, and, perhaps, scarcely less power as a solvent. The 'vinum' of the Ph. U. S. was formerly Teneriffe. Dr. B. Lane's process for preparing medicated wines by fermentation is noticed at the end of the alphabetical list given below.

"Medicated wines should be kept in stoppered glass vessels, and be frequently shaken during maceration." (Ph. L.)

The following are the principal medicated wines at present in use:—

Wine of Al'oes. *Syn.* VINUM ALOËS (B. P., Ph. L. & E.), TINCTURA SACRA†, TINCT. HIERÆ PICRÆ†, L. *Prep.* 1. (B. P.) Socotrine aloes, 1½ oz.; ginger, in coarse powder, 80 grs.; cardamona seeds, bruised, 80 grs.; sherry, 40 oz.; digest seven days, strain, and make it up to 40.—*Dose.* 1 to 2 drms.

2. (Ph. L.) Powdered Socotrine or hepatic aloes, 2 oz.; powdered canella, ½ oz.; sherry, 1 quart; macerate for 14 days, and filter. In the Ph. E. cardamoms and ginger, of each, 1½ dr., are substituted for canella.—*Dose.* As a purgative, ½ to 2 fl. oz.; as a stomachic, 1 to 2 fl. drs.

Wine of Aloes (Al'kaline). *Syn.* VINUM ALOËS ALKALINUM, L. *Prep.* (Dr. A. T. Thomson.) Carbonate of soda, 3 oz.; myrrh and extract of aloes, of each 6 drs.; sesquicarbonate of ammonia, 4½ drs.; sherry, 24 fl. oz. (say 1½ pint); macerate, as before. In dyspepsia, chlorosis, &c.—*Dose.* As the last.

Wine, Antimo'nial. *Syn.* TARTAR EMETIC WINE; WINE OF POTASSIO-TARTRATE OF ANTIMONY; VINUM ANTIMONII POTASSIO-TARTRATIS (Ph. L.), V. ANTIMONIALE (B. P., Ph. E.), L. *Prep.* 1. (B. P.) Tartarated antimony, 2 grs.; sherry, 1 oz.—*Dose.* 10 to 60 minims. (In consequence of the insolubility of the tartarated antimony in the sherry, Squire recommends it to be dissolved in about ten times its weight of hot water, and that the wine be added to the solution.)

2. (Ph. L. & E.) Potassio-tartrate of antimony, 40 grs.; sherry, 1 pint; dissolve. Each fluid oz. contains 2 grs. of emetic tartar.—*Dose.* As a diaphoretic and expectorant, 10 to 30 drops, frequently; as a nauseant, 1 to 2 fl. drs.; as an emetic, 2 to 4 fl. drs. The corresponding compound of the Ph. D. is ANTIMONII TARTARIZATI LIQUOR. See SOLUTION OF POTASSIO-TARTRATE OF ANTIMONY.

Wine, Chalyb'eate. See WINE OF IRON.

Wine of Col'chicum. *Syn.* WINE OF COLCHICUM ROOT; VINUM COLCHICI (B. P.); VINUM RADICIS COLCHICI (Ph. L. & E.), L. *Prep.* 1. (B. P.) Colchicum corms, dried and sliced, 4; sherry, 20; macerate seven days, and strain.—*Dose.* 20 to 30 minims.

2. (Ph. L.) Dried corms of meadow saffron (sliced), 8 oz.; sherry wine, 1 quart; macerate 7 days, and strain; (press strongly the residuum and filter the mixed liquor—Ph. E.). A powerful sedative and purgative.—*Dose.* ½ to 1 fl. dr.; in gout, acute rheumatism, and other painful and inflammatory and nervous affections.

Obs. The celebrated EAU MÉDICINALE of M. Husson (AQUA MEDICINALES HUSSONII) resembles, in composition and action, the above preparation in every point except its strength, which, we believe, is much above that of the wine of the British Colleges.

Wine of Colchicum Seed. *Syn.* VINUM SEMINIS COLCHICI, V. SEMINUM C., L. *Prep.* (Ph. U. S. & Dr. Williams.) Seeds of meadow saffron (preferably ground in a coffee-mill), 2 oz.; sherry, 16 fl. oz.; macerate for 14 days. —*Dose.* 1 to 1½ fl. dr.; in gout, &c.

Wine, Emet'ic. See ANTIMONIAL WINE, WINE OF IPECACUANHA, &c.

Wine of Gen'tian. *Syn.* BITTER WINE, TONIC W.; VINUM AMARA, V. GENTIANÆ (Ph. E.), L. *Prep.* (Ph. E.) Gentian, in coarse powder, ½ oz.; yellow bark (do.), 1 oz.; dried orange peel, 2 drs.; canella, in coarse powder, 1 dr.; proof spirit, 4½ fl. oz.; digest for 24 hours, then add of sherry, 1 pint and 16 fl. oz., and further digest for 7 days. Tonic and stomachic.—*Dose.* ½ to ¾ fl. oz.

Wine of Hel'lebore. See WINE OF WHITE HELLEBORE.

Wine of Ipecacuan'ha. *Syn.* EMETIC WINE; VINUM IPECACUANHÆ (B. P., Ph. L. E. & D.), L. *Prep.* 1. (B. P.) Ipecacuanha, bruised, 1; sherry, 20: macerate seven days, shaking occasionally, strain, and make up to 20.—*Dose.* As an expectorant, 5 to 40 minims; as an emetic, 3 to 6 drms.

2. Ipecacuanha root, bruised, 2½ oz.; sherry, 1 quart; macerate for 7 days (14 days, and strain, with expression—Ph. D.). This is a mild and excellent preparation.—*Dose.* As a diaphoretic and expectorant, 10 to 40 drops, in coughs, diarrhœa, dysentery, dyspepsia, &c.; as an emetic, 2 fl. drs. to 1 fl. oz., in divided doses; as an emetic for infants and young children, ½ teaspoonful every 10 or 15 minutes until it operates.

Wine of I'ron. *Syn.* CHALYBEATE WINE, STEEL W.; VINUM FERRI (B. P., Ph. L.), L. *Prep.* 1. (B. P.) Fine iron wire (No. 35), 1 oz.; sherry, 20 oz.; digest thirty days with frequent agitation. The bottle to be corked, but the wire not wholly immersed.—*Dose.* 1 to 4 drms.

2. (Ph. L.) Iron wire, 1 oz.; sherry, 1 quart; digest, with frequent agitation, for 30 days, and strain. Each fl. oz. contains less than 1½ gr. of metallic iron.

2. Ammonio-tartrate of iron (Aikin's), 1½ dr.; sherry, 1 pint; dissolve. Frequently substituted for the last, especially when the preparation is required in a hurry.—*Dose.* 1 to 5 fl. drs.; as a mild chalybeate.

Obs. The formula for WINE OF IRON was modified in the Ph. L. 1824, omitted in that of 1836, and restored, in its original character, in that of 1851.

Wine of Mea′dow Saf′fron. WINE OF COLCHICUM.

Wine of O″pium. *Syn.* SYDENHAM'S LIQUID LAUDANUM†; VINUM OPII (B. P., Ph. L. E. & D.), TINCTURA THEBAICA†, LAUDANUM LIQUIDUM SYDENHAMI†, L. *Prep.* 1. (B. P.) Extract of opium, 1 oz.; cinnamon bark, 75 grs.; cloves, 75 grs.; sherry wine, 20 oz.: macerate for seven days and filter.—*Dose.* 10 to 40 minims.

2. (Ph. L.) Extract of opium (Ph. L.), 2½ oz.; cinnamon and cloves, of each, bruised, 2½ drs.; sherry, 1 quart; macerate for 7 days (14 days—Ph. D.), and filter. In the Ph. E., opium, 3 oz., and in the Ph. D., opium, in coarse powder, 3 oz., are ordered, instead of extract of opium. The Dublin College also omits the aromatics.

3. (Wholesale.) From extract of opium, 11 oz.; oil of cassia, 25 drops; oil of cloves, 20 drops; wine, 1 gal.; (or rectified spirit, 1½ pint; water, 6½ pints; colouring, q. s.;) digest, with agitation, until dissolved. Milder than the tincture.—*Dose.* 10 to 40 drops; as an anodyne and hypnotic.

Wine of Opium (Fermented). *Syn.* ROUSSEAU'S LAUDANUM, BLACK-DROP; VINUM OPII FERMENTATIONE PARATUM, GUTTA NIGRA, L. *Prep.* (P. Cod.) Opium, 4 oz.; boiling water, 5 lbs.; dissolve, add, of honey, 1 lb.; yeast, 2 drs.; keep it at 86° Fahr. for a month, or until the fermentation is complete; then press, filter, distil off 16 oz., and evaporate the residuum to 10 oz.; distil the 16 oz. of spirit obtained above until 12 oz. have passed over, and from this, by a third distillation, obtain 4½ oz., which add to the evaporated solution (10 oz.), and filter. About four times as strong as tincture of opium. See BLACK DROP (*page* 530).

Wine of Potas′sio-tartrate of Antimony. See ANTIMONIAL WINE (*above*).

Wine of Quinine′. *Syn.* VINUM QUINIÆ, (B. P.), L. *Prep.* 1. (B. P.) Sulphate of quinina, 20 grs.; citric acid, 30 grs.; orange wine, 20 oz.; dissolve the citric acid and then the sulphate of quinia in the wine; digest three days and filter.—*Dose.* ½ to 1 oz.

2. (Magendie.) Sulphate of quinine, 14 grs.; sherry, 1 quart; agitate frequently for some time. "The sulphate of quinine requires to be dissolved in a little dilute sulphuric acid before it is added to the wine." (Dr. Hayes.)—*Dose.* 1 wine-glassful, as a tonic and stomachic.

Wine of Rhu′barb. *Syn.* VINUM RHEI (B. P., Ph. E. & D.), L.; TINCTURA RHÆI VINOSA. *Prep.* 1. (B. P.) Rhubarb, in coarse powder, 1½; canella bark, ⅛; sherry, 20: macerate seven days, filter, and make up to 20.—*Dose.* 1 to 2 drms.

2. (Ph. E.) Rhubarb, in coarse powder, 5 oz.; canella, in coarse powder, 2 drs.; proof spirit, 5 fl. oz.; sherry, 1¼ pint; macerate for 7 days, press, and filter.

3. (Ph. D.) Rhubarb, 3 oz.; canella, 2 drs.; sherry, 1 quart; macerate 14 days. Weaker than the last.—*Dose.* As a stomachic, 1 to 3 fl. drs.; as a purgative, ½ to 1 fl. oz., or more. It does not keep well.

Wine of Tobac′co. *Syn.* VINUM TABACI, (Ph. E.). L. *Prep.* (Ph. E.) Tobacco, 3½ oz.; sherry, 1 quart; digest 7 days, strain, with strong pressure, and filter. A powerful sedative and diuretic.—*Dose.* 10 to 30 drops; in dropsy, lead colic, ileus, &c.

Wine of White Hel′lebore. *Syn.* VINUM VERATRI (Ph. L.), TINCTURA VERATRI ALBI†, L. *Prep.* (Ph. L.) White hellebore, sliced, 8 oz.; sherry wine, 1 quart; digest for 7 days, press, and filter.—*Dose.* 10 drops, gradually increased to 25 or 30; as a substitute for colchicum, in gout and rhematism, &c. It is less manageable than wine of colchicum, and is now seldom employed.

Wine of White Hellebore (Opiated). *Syn.* MOORE'S EAU MÉDICINALE; VINUM VERATRI OPIATUM, L. *Prep.* From wine of white hellebore, 3 fl. drs.; tincture of opium, 1 fl. dr.—*Dose.* As the last.

Wines, Medicated (Dr. B. Lane's). *Syn.* VINOUS ESSENCES; ESSENTIÆ VINOSÆ, LIQUORES VINOSI, L. *Prep.* From an infusion or solution of the drug, of about 3 or 4 times the usual strength, fermented with a little yeast, and about 3 or 4 lbs. of sugar per gallon; the fermented liquor being afterwards set in a cool cellar until fit for bottling. Compounds of CALUMBA, CASCARILLA, GENTIAN, OPIUM, RHUBARB, SENNA, and VALERIAN, have been thus prepared. That of OPIUM is made of only twice the strength of the common tincture.

WINE-STONE. CRUDE TARTAR, or ARGOL.

WINE-TESTS. *Prep.* 1. (Hahnemann's.) From quicklime, 1 oz.; flowers of sulphur, 1½ oz.; mix, and heat them in a covered crucible for 5 or 6 minutes; put 2 drs. of the product and an equal weight of tartaric acid (separately powdered), into a stoppered bottle, with a pint of water, and shake them well; let the liquid settle, pour off the clear portion, and add of tartaric acid, 1½ dr.

2. (Dr. Paris's.) From sulphide of calcium and cream of tartar, of each (in powder), ½ oz.; hot water, 1 pint; agitate, &c., as before; decant the cold clear liquid into 1-oz. phials, and add 20 drops of hydrochloric acid to each of them.

Obs. The above tests will throw down the least quantity of lead from wines, as a very sensible black precipitate. As iron might be accidentally contained in the wine, the hydrochloric acid is added to the last test, to prevent the precipitation of that metal.

WIN′TER-GREEN (American). *Syn.* PIPSISSEWA; CHIMAPHILA (Ph. L. & E.), PYROLA (Ph. D.), L. The herb of *Chimaphila umbellata.* It is astringent, diuretic, tonic, and stomachic; and has been successfully administered in loss of appetite, dyspepsia, dropsy, chronic affections of the urinary organs, scrofula, &c. It must not be confounded with ordinary winter-green (box berry, chequer b., partridge b., mountain tea), which is the *Gaultheria procumbens*, a plant belonging to the *Ericaceæ*, whilst the former plant belongs to a genus of the *Pyrolaceæ*. See DECOCTION, EXTRACT, and OILS (Essential.)

WITCH MEAL. *Syn.* VEGETABLE SULPHUR, LYCOPODIUM. The spores of *Lycopodium clavatum*, or club moss.

WOAD. *Syn.* DYER'S WOAD; PASTEL, Fr. The *Isatis tinctoria*. To prepare them for the dyer, the leaves are partially dried and ground to a paste, which is made into balls; these are placed in heaps, and occasionally sprinkled with water, to promote the fermentation; when this is finished, the woad is allowed to fall down into lumps, which are afterwards reground and made into cakes for sale. On mixing the prepared woad with boiling water, and, after standing for some hours in a close vessel, adding about 1-20th its weight of newly slaked lime, digesting in a gentle warmth, and stirring the whole together every 3 or 4 hours, a new fermentation begins; a blue froth rises to the surface, and the liquor, though it appears itself of a reddish colour, dyes woollens of a green, which, like the green from indigo, changes in the air to a blue. This is said to be one of the nicest processes in the art of dyeing, and does not well succeed on the small scale. Woad is now mostly used in combination with indigo. 50 lbs. of woad are reckoned equal to 1 lb. of indigo.

WOL'FRAM. See TUNGSTEN.

WOLFS'BANE. See ACONITE.

WOOD is polished by carefully rubbing down the grain with fine glass paper, or pumice-stone, and then rubbing it, first with finely-powdered pumice-stone and water, and afterwards with tripoli and linseed oil, until a proper surface is obtained. For common purposes, glass paper, followed by a metal burnisher, is employed.

Wood is stained by the application of any of the ordinary liquid dyes employed for wool or cotton. They sink deeper into the wood when they are applied hot. When the surface is properly stained and dried, it is commonly cleaned with a rag dipped in oil of turpentine or boiled oil, after which it is either varnished or polished with bees' wax. Musical instruments, articles of the toilette, &c., are usually treated in this way.

Wood is preserved by any agents which destroy the tendency to putrefaction of the matter within its pores, or which enables it to resist the attack of insects, or renders it unsuited to the growth of minute fungi. See DRY-ROT.

WOOD NAPH'THA. See SPIRIT (Pyroxylic).

WOODY FIBRE. See LIGNIN.

WOODY NIGHT'SHADE. BITTER-SWEET, *Solanum dulcamara.*

WOOL. *Syn.* LANA, L. Wool is a fine, soft, elastic variety of hair, cellulated in its structure. Its filaments are cylindrical, like those of silk; but the surface is covered with thin scales or epidermic cells. In the finer qualities, these filaments vary in thickness from $\frac{1}{1100}$ to $\frac{1}{1500}$ of an inch; and under a good microscope distinctly exhibit, at intervals of about $\frac{1}{500}$ of an inch, a series of serrated rings, imbricated towards each other, "like the joints of equisetum, or, rather, like the scaly zones of a serpent's skin." These appearances render it almost impossible to mistake wool for silk, linen, or cotton. From experiments made by different competent authorities, it is found that wool is one of the worst conductors of heat known. This property renders woollen fabrics particularly adapted for clothing in cold, damp, and changeable climates, since it enables them to maintain the surface of the body at a proper and equable temperature. Wool sometimes, however, proves too irritative for highly sensitive skins, and, moreover, disturbs the electricity of the cutaneous surface, on friction, even more than silk. On these accounts there are persons who find it unpleasant to wear woollen garments, of any description, next the skin; in which cases all the advantages that can be derived from their use may be obtained by wearing them outside one of linen or cotton. According to Erasmus Wilson, this method "is preferable in warm weather, since the linen absorbs the perspiration, while the woollen garment preserves the warmth of the body, and prevents the inconvenience resulting from its evaporation. See FLANNEL.

Identif. 1. By the microscope. (See *above.*)

2. Its fibres, when inflamed, shrivel up, and burn with difficulty, and evolve the peculiar and characteristic odour of hair when similarly treated, leaving a bulky charcoal; whereas cotton and linen burn rapidly, leave no charcoal, and evolve little or no odour. Silk acts in nearly the same manner as wool.

3. Nitric acid, picric acid, and gaseous chlorine, stain the fibres of wool and silk yellow. Dr. J. J. Pohl recommends an aqueous or alcoholic solution of picric acid as well adapted for a test.—After immersion of a small portion of the fabric or yarn for from 5 to 10 minutes in the solution, it is to be taken out, and washed in warm water. The linen and cotton in it will then appear white, but the wool, silk, or other animal fibre, will retain its yellow colour. In stuffs, cloths, flannels, &c., the mixed threads may be readily observed by means of a pocket lens, and their relative numbers may be ascertained by means of a 'thread counter.' This test acts best with white, but is also applicable to many other colours. For dark colours nitric acid is preferable.

4. A square inch of the fabric or a small portion of the yarn, is boiled for a short time

in a solution of caustic soda or potassa, and then withdrawn and washed. If it be of pure wool, it will be dissolved, and wholly disappear; if any threads or fibres are left undissolved, they consist of either cotton or linen; of these, such as have acquired a dark yellow tinge, are linen, whilst those which have retained their whiteness, or which are only slightly discoloured, are cotton. The relative proportion of the adulteration may be ascertained as before. See COTTON, LINEN, and SILK.

Wool and woollen goods exhibit a greater affinity for colouring matter than either cotton or linen, and in many cases this exceeds even that of silk. The most difficult dye to impart to wool is a rich, deep, and permanent black. See DYEING, MORDANTS, &c.

Woollen goods are cleaned and scoured in the manner noticed under BLEACHING and SCOURING.

Wool, Spanish. Rouge crepons.

WOORA'RA. *Syn.* OURARI, WOURALI. A deadly poison employed in Guiana, obtained from the *Strychnos toxifera*. See UPAS.

WOOTZ. The Indian name of steel; applied in this country to the steel imported from Bengal.

WORM BARK. *Syn.* CABBAGE-TREE BARK, or GEOFFRÆYA INERMIS, L. The bark of *Andira inermis* (*Geoffræya i.* of some botanists). A powerful astringent, purgative, anthelmintic, and narcotic.—*Dose.* 10 to 30 grs. In larger doses, or if cold water be drunk during its action, it is apt to occasion sickness, vomiting, and delirium. The remedy for this is copious draughts of warm water.

WORM SEED. *Syn.* SEMEN CONTRA, SEMEN CINÆ, L. The broken peduncles, mixed with the calyces and flower-buds, of several species of *Artemisia* imported from the Levant. —*Dose.* 10 to 30 grs., in powder; as a vermifuge. See SANTONIN.

WORMS. (Intes'tinal). *Syn.* VERMES, INTESTINALIA (Cuvier), ENTOZOA (Rudolphi), L. The principal parasites which are generated and nourished in the human intestinal canal are the—*Ascaris lumbricoides* (Gmelin), or long round-worm, found in the small intestines, and which is generally of the thickness of a goose-quill, and varies in length from 10 to 15 inches;—*Ascaris vermicularis* (Gmelin), maw, or thread-worm, which is thread-like in appearance, varies from 1½ to 5 lines in length, and confines itself chiefly to the rectum;—*Tricocephalus hominis* (Gmelin), or long thread-worm, varying from 1½ to 2 inches in length, and found chiefly in the cæcum;—*Tænia solium* (Gmelin), or common tapeworm, having a flattened riband-like appearance, varying in length from 3 or 4 to 15 or 20 feet, and occupying the small intestines;—*Bothriocephalus latus* or broad tape-worm, a variety seldom found in this country, but common in Switzerland and the north of Europe; and *Tænia mediocanellata*, another large species described by Küchenmeister.

Causes. A debilitated state of the digestive organs, improper food, sedentary habits, impure air, bad water, and, apparently, an occasional hereditary tendency to worms.

Symp. Griping pains, especially about the navel; acid eructations; slimy stools; occasional nausea and vomiting, without any manifest cause; heat and itching about the anus; tenesmus; emaciation; disturbed dreams; grinding of the teeth during sleep; pallor of countenance; discoloration round the eyes; feverishness; headache; vertigo, &c. In many cases these symptoms are often highly aggravated, and mistaken for primary diseases. The only absolutely positive evidence of the existence of worms is, however, their being seen in the fæces.

Treat. In common cases, an occasional moderately strong dose of calomel overnight, followed by a smart purgative the next morning, is an excellent remedy, where the use of mercurials is not contra-indicated. Cowhage, made into an electuary with honey or treacle, is also an excellent vermifuge. Oil of turpentine is useful against nearly every variety of worms, and, when taken in sufficient doses to reach the rectum, is almost specific in ascarides (thread-worms). When this is inconvenient, an occasional enema of oil of turpentine is even more effective. Enemas of aloes are also very useful in such cases. Scammony, under the form of basilic powder, has long been employed to expel worms in children. Aloes, castor oil, worm-seed, tin-filings, and sulphur, are likewise popular remedies. Cabbage-tree bark is a powerful anthelmintic; but its use requires caution. Most of the quack vermifuges contain either aloes and gamboge, or calomel and jalap. The substances which have been most highly extolled for the destruction or expulsion of tape-worm (tænia) are kousso, oil of turpentine, male fern, pomegranate, and tin-filings. The first two are those on which the most dependence may be placed. Madame Nouffer's celebrated 'Swiss remedy' for tapeworm, for which Louis XVI gave 18,000 francs, consisted of 2 or 3 drs. of powdered male fern, taken in ½ pint of water, in the morning, fasting, followed in 2 hours by a bolus made of calomel and scammony, of each, 10 grs., gamboge, 6 or 7 grs. 'Swain's vermifuge' is prepared from worm-seed, 2 oz.; valerian, rhubarb, pink-root, and white agaric, of each, 1½ oz.; boiled in water, q. s. to yield 3 quarts of decoction, to which 30 drops of oil of tansy, and 45 drops of oil of cloves, dissolved in a quart of rectified spirit, are added. All purgatives may be regarded as vermifuges. Besides our efforts to destroy and expel the worms, the tone of the primæ viæ should be raised by the use of stomachics and tonics, by which the tendency to their equivocal generation will be either removed or lessened. See DECOCTION, ENEMA, PILLS, PATENT MEDI-

Cines, Vermifuges, &c.; and also the several vermifuges under their respective names.

Obs. Parasitic worms as existing in animals are so remarkably prevalent and so widely diffused that probably no creature can be said to be secure against their attack. Among domestic animals, sheep often suffer to a most serious extent from these parasites, and more especially from the nematoid, known as *Strongylus bronchialis.* In some years lambs are lost by hundreds from the complications of disease which attend upon the presence of these worms within the windpipe and the bronchial tubes. Their existence is marked by great wasting of the body, hurried breathing, and distressing cough. After a time diarrhœa sets in, which quickly carries off the animal. It has been found that lambs fed on clover, and other allied plants, which had been pastured the year previously with sheep, suffer the most, and are far more likely to be affected than those which are differently managed. Remedial measures too often prove ineffectual, especially when structural disease of the lungs has followed as a consequence. The exhibition of oil of turpentine in doses of about half an ounce, mixed with an equal quantity of linseed oil, is sometimes found to be beneficial; but it must be conjoined with a corn diet, the free use of salt, and also sulphate of iron mixed with the manger food, tincture of assafœtida, and the essential oil of savin, in small doses, are remedies greatly extolled by some persons. The inhalation of diluted chlorine gas or of sulphuric acid gas is often exceedingly beneficial; but remedies of this kind ought always to be confided to the superintending care of the veterinary surgeon.

WORM TEA. A preparation sold in the shops of the United States, and much used, consisting, according to Brande, of spigelia or pink-root, savin, senna, and manna.

WORM'WOOD. *Syn.* Absinthium (Ph. L. & E.), L. The flowering herb of *Artemisia Absinthium,* a well-known plant, indigenous to this country, and largely cultivated for medicinal purposes. It is a bitter tonic and stomachic, and also anthelmintic.—*Dose.* 20 to 40 grs. of the dried herb, either in powder or made into a tea or infusion; in dyspepsia, dropsy, scurvy, sympathetic epilepsy, &c. See Absinthine and Absinthic Acid.

WORT. The technical name for the fermentable infusion of malted grain.

The strength of worts is ascertained by means of an instrument termed a saccharometer. "Brewers, distillers, and the excise, sometimes denote by the term 'gravity' the excess of weight of 1000 parts of a liquid by volume above the weight of a like volume of distilled water, so that if the specific gravity be 1045, 1070, 1090, &c., the gravity is said to be 45, 70, or 90; at others, they thereby denote the weight of saccharine matter in a barrel (36 galls.) of wort; and again, they denote the *excess in weight of* a barrel of wort over a barrel of water equal to 36 gallons, or 360 lbs. This and the first statement are identical, only 1000 is the standard in the first case, and 360 in the second." (Ure.) The last is that commonly adopted by the brewers.

According to Dr. Ure, the solid dry extract of malt, or 'saccharine,' has the specific gravity 1·264, and the specific volume ·7911; "that is, 10 lbs. of it will occupy the volume of 7·911 lbs. of water. The mean sp. gr., by computation of a solution of that extract in its own weight of water, is 1·116; but by experiment, the sp. gr. of that solution is 1·216, showing considerable condensation of volume in the act of combination with water." The quantity of solid saccharine or sugar in a wort may be determined in the manner mentioned under Syrup.

"According to the compilers of the tables accompanying Field's alcoholometer, 1·8 lb. of saccharine is decomposed for the production of $1\frac{0}{0}$ of proof spirit; but according to our experiments, the proportion of saccharine named is rather below the true equivalent." (Cooley.)

The rapid cooling of worts is an important object with the brewer and distiller. On the large scale, the old system, in which shallow coolers are employed, with all its numerous inconveniences and accidents, is now for the most part abandoned, being supplanted by the method introduced by Mr. Yandall, nearly 40 years ago. This consists in the use of a 'refrigerator,' which is an apparatus so constructed that any hot liquid may be cooled by about its own volume of cold water, in a very short space of time. The principle is that of passing the two fluids through very shallow and very long passages, in opposite directions, being essentially that of a 'Liebig's condenser' on a gigantic scale. The apparatus may consist of zigzag passages, flattened tubes or convoluted curves, of any convenient shape, so that they possess little capacity in one direction, but great breadth and length. A refrigerator, having the passages for the fluids $\frac{1}{8}$ of an inch thick, is said to require a run of about 80 feet. The success of this method is such as to leave nothing more to desire. See Brewing, Fermentation, Malt, &c.

WOUND. *Syn.* Vulnus, L. A solution of continuity in any of the soft parts of the body, arising from external violence.

Wounds are distinguished by surgeons into contused wounds, incised w., lacerated w., poisoned w., punctured w., &c.; terms which explain themselves. Sword-cuts are incised wounds; gun-shot wounds, lacerated and contused ones. Slight wounds, and, indeed, all those not demanding material surgical assistance, after dirt and foreign substances have been removed, may be treated in the manner noticed under Cuts and Abrasions.

WOUND BAL'SAM. See Tincture of Benzoin.

WRIT'ING, executed in the ordinary tanno-gallic ink, and which has been rendered illegible by age, may be restored by carefully moistening it, by means of a feather, with an infusion of galls, or a solution of ferrocyanide of potassium slightly acidulated with hydrochloric acid, observing to apply the liquid so as to prevent the ink spreading.

WRITING FLU'IDS. A term commonly applied, of late years, to easy flowing inks, adapted for metallic pens; in contradistinction to the old tanno-gallic compounds at one time exclusively employed for writing.

Prep. 1. Dissolve pure basic or soluble Prussian blue in pure distilled water, and dilute the resulting solution with pure water until the desired shade of colour is obtained. Very permanent and beautiful. It is not affected by the addition of alcohol, but is immediately precipitated by saline matter. The precipitate, however, still possesses the property of dissolving in pure water.

2. From the soluble ferrocyanide of potassium and iron, dissolved in pure water. Resembles the last, but it is precipitated from its solution by alcohol.

3. Powdered Prussian blue, 1 oz.; concentrated hydrochloric acid, 1½ fl. oz.; mix in a matrass or glass bottle, and, after 24 or 30 hours, dilute the mass with a sufficient quantity of water.

4. Dissolve sulphindylate of potassa or ammonia in hot water, and, when cold, decant the clear portion. It is an intense blue, and dries nearly black; is perfectly incorrosive, and very permanent and easy flowing.

5. (Horning.) Perchloride of iron, 4 parts; water, 750 parts; dissolve, add of cyanide of potassium, 4 parts, dissolved in a little water; collect the precipitate, wash it with several effusions of pure water, allow it to drain until it weighs about 200 parts, then add of oxalic acid, 1 part; and promote solution by agitating the bottle or vessel containing it.

6. (Mohr.) Pure Prussian blue, 6 parts; oxalic acid, 1 part; triturate with a little water to a perfectly smooth paste, then dilute the mass with a proper quantity of soft water. The product resembles Stephen's 'patent blue ink.'

7. (Rev. J. B. Reade—patented.)—*a.* A solution of his patent soluble Prussian blue in distilled water. Blue.

b. Prepared by adding to good gall ink a strong solution of his soluble Prussian blue. This addition "makes the ink, which was previously proof against alkalies, equally proof against acids, and forms a writing fluid which cannot be erased from paper by any common method of fraudulent obliteration without the destruction of the paper." This ink writes greenish blue, but afterwards turns intensely black. Stephen's 'patent ink,' which does the same, is a similar compound.

8. (Prof. Runge—CHROMIC INK.) Logwood, in fine chips, ¼ lb.; boiling water, 3 pints; digest for 12 hours, then simmer the liquid down gently to 1 quart, carefully observing to avoid dust, grease, and smoke; when cold, decant the decoction, and add to it of yellow chromate of potash, 20 grs.; dissolve by agitation, after which it will be fit for use. Cheap and good. It resists the action of all ordinary destructive agents better than the tanno-gallic inks; it may be washed after use with a wet sponge, or steeped for twenty-four hours in water, or even tested with dilute acids, and yet preserve its original blackness. It is perfectly liquid, it scarcely thickens by age, and neither deposits a sediment nor corrodes steel pens.

9. (Ure.) From vanadate of ammonia decomposed with infusion of galls. It is of a perfectly black hue, flows freely from the pen, is rendered blue by acids, is unaffected by dilute alkaline solutions, and resists the action of chlorine.

Obs. The preceding formulæ, under proper management, produce excellent products, all of which are extremely mobile, and most of them of a more or less beautiful colour. The blue ones, when concentrated, dry of a blue black, whilst two or three of the others, though at first pale, rapidly pass into a deep black, when exposed to the air. Care must be taken in all cases that the ingredients be pure. The Prussian blue, except when directly prepared for the purpose, should be washed in dilute hydrochloric acid before attempting its solution by means of oxalic acid. Unless these precautions are attended to, success is unlikely. A little gum may be added, if required, to prevent the fluid spreading on the paper; but in most cases the addition is no improvement. Most of the blue fluids may be used as 'indelible ink' to mark linen, and will be found very permanent, provided the part be first moistened with alum water, and dried.

XYLOID'IN. When starch is immersed in concentrated nitric acid (sp. gr. 1·45 to 1·50), it is converted, without disengagement of gas, into a colourless, tremulous jelly, which, when treated with an excess of water, yields a white, curdy, insoluble substance, which, after being edulcorated with pure water, until every trace of acid is removed, is xyloidin. Paper, sugar, gum, mannite, and several other substances, treated in the same manner, become in great part changed to xyloidin or analogous compounds.

Obs. Pure xyloidin differs but slightly from pyroxylin, or pure gun-cotton.

XYL'OL. A hydrocarbon, homologous to benzol, found in wood-tar and coal-gas naphtha.

YAWS. *Syn.* FRAMBŒSIA, L. A peculiar disease of the skin common in the Antilles and some parts of Africa. It is characterised by mulberry-like excrescences, which discharge a watery humour. The treatment chiefly consists in alleviating urgent symptoms (if any), and the adoption of a temperate diet and regimen, until the eruptions, having run their course, begin to dry, when tonics and alteratives, as cinchona bark, quinine, and sarsaparilla, with occasional small doses of mercurials, generally prove advantageous. The master (or principal) yaw, which frequently remains troublesome after the others have disappeared, may be dressed with the ointment of nitric-oxide of mercury, or of nitrate of mercury, diluted with an equal weight of lard.

The yaws is not a dangerous, although a very disgusting, disease. It is contagious by contact, and, like the smallpox, only occurs once during life.

YEAST. *Syn.* Barm, Ferment, Zumine; Fermentum, L. Yeast, which consists almost entirely of minute vegetable cells, termed *Torula cerevisiæ*, is either the froth or the deposit of fermenting worts, according to the character of the fermentation.

The top yeast, or superficial ferment, which covers the surface of fermenting worts, is called '*oberhefe*' by the Germans; and the bottom yeast, or the ferment of deposit, is termed '*unterhefe*.' The first is the common yeast of the English brewer; the other, that used in Bavaria for the fermentation of worts from below (untergährung). Both varieties yield their own kind under proper conditions. Wort fermented with top yeast, at from 46 to 50° Fahr., yield both varieties, and each of these furnishes its own kind, nearly pure, by a second fermentation. See Brewing, Fermentation, &c.

Pres. 1. Ordinary beer yeast may be kept fresh and fit for use for several months, by placing it in a close canvas bag, and gently and gradually squeezing out the moisture in a screw press, until the remaining matter acquires the consistence of clay or soft cheese, in which state it must be preserved in close vessels, or wrapped in waxed cloth. This is the method generally adopted for the best Flanders and German yeast.

2. Whisk the yeast until it forms a uniform liquid mass, and then lay it with a clean and soft painter's brush evenly and thinly on flat dishes, or any convenient surface, on which it can be exposed to the sun or air; this operation must be repeated as soon as the first coat is sufficiently solid, and so on, until the layers acquire a proper thickness, when it must be detached and preserved as before. If rendered quite dry, its power of exciting fermentation will be destroyed.

3. By employing strips of clean new flannel (well washed), as above; and, when sufficiently dry, rolling these up, and covering them with waxed cloth or paper, or placing them in tin canisters or boxes. For *use*, a few inches of one of the strips is cut off, and soaked in lukewarm water, when the barm leaves the flannel, and mixes with the water, which may then be *stirred up with the flour*.

Yeast, Artifi''cial. "Although the conversion of a small into a large quantity of yeast is a very easy thing, yet to produce that substance from the beginning is very difficult." (Berzelius.) Both cases are met in the formulæ below.

Prep. 1. (*Without a ferment.*)—*a.* (Fownes.) Wheat flour is to be mixed with water into a thick paste, which is to be slightly covered, in a moderately warm place; about the third day, it begins to emit a little gas, and to exhale a disagreeable sour odour; about the sixth or seventh day the smell changes, much gas is evolved, accompanied by a distinct and agreeable vinous odour, and it is then in a state to excite either to vinous or panary fermentation, and may be either at once employed for that purpose or formed into small and very thin cakes, dried in the air, and preserved for future use. Wort fermented with it in the ordinary way yields a large quantity of yeast, of excellent quality, which is found at the bottom of the vessel. "This is a revival of a method which, although Mr. Fownes seems to regard it as new, is to be found in the 'Chemistry' of Boerhaave." ('Lancet.') It is, indeed, a mere modification of the mode of preparing leaven, as practised from the most remote ages of antiquity; but is not the less valuable on that account.

2. (*With a ferment.*)—*a.* Take of bean flour, ½ lb.; water, 6 quarts; boil for ½ an hour, pour the decoction into any suitable vessel, add of wheat flour, 3½ lbs.; stir the whole well together, and, when the temperature reaches 55° Fahr., add of beer yeast, 2 quarts; mix well, and in 24 hours after the commencement of the fermentation add of barley or bean flour, 7 lbs.; make a uniform dough by thorough kneading, form it into small cakes, as above, and then preserve these in a dry situation. For *use*, one of these discs is to be broken into pieces, laid in tepid water, and set in a warm place during 12 hours, when the soft mass will serve the purpose of beer yeast.

b. (Patent yeast.) Take of hops, 6 oz.; water, 3 galls.; simmer for 3 hours, strain, and in 10 minutes stir in of ground malt, ½ peck; next reboil the hops in water, as before, and let the strained liquor run into the first mash, which must then be well stirred up, covered over, and left for 4 hours; after that time drain off the wort, and, when the temperature has fallen to 90° Fahr., set it to work with yeast (preferably patent), 1 pint; after standing for 20 to 24 hours in a warm place, take off the scum, strain it through a coarse hair sieve, and it will be fit for use. 1 pint is said to be enough for 1 bushel of bread.

Obs. The preparation of artificial yeast, and substitutes for yeast has long engaged the attention of both the scientific chemist and the practical tradesman. The subject is, undoubtedly, of great importance to emigrants and voyagers. The above processes, by good management, yield products which are all that can be desired.

YELLOW DYES. The following substances impart a yellow to goods, either at once or after they have been mordanted with alumina or tin:—annotta, barberry root, dyer's broom, French berries, fustic, fustet, quercitron bark, and turmeric. Goods mordanted with acetate of lead, and afterwards passed through a bath of chromate of potash, acquire a brilliant chrome-yellow colour;—solution of sulphate or acetate of iron, followed by immersion in potash or lime water, gives a buff or orange;—orpiment, dissolved in ammonia water, imparts a golden yellow. (See the above-named substances, in their alphabetical places.) An aniline yellow (chrysaniline) has recently been obtained by Mr. Nicholson, which is said to be a most valuable dye-stuff, comparable, indeed, with the aniline reds and purples.

YELLOW FEVER. The bilious remittent fever of hot climates. It is very common in the West Indies and the Southern States of America. New Orleans has been several times nearly depopulated by it.

YELLOW PIGMENTS. Of these the principal are—

Brown Pink. *Prep.* Take of French berries and pearlash, of each, 1 lb.; fustic chips, ½ lb.; water, 2 gallons; boil in a tin or pewter vessel, and strain the decoction through flannel, whilst hot; then dissolve alum, 1½ lb. in hot water, 2½ galls.; add the solution to the strained decoction as long as a precipitate falls, which must afterwards be washed, drained, and dried. Some manufacturers omit the fustic. A good glazing colour, when ground in linseed, and used with drying oil.

Yellow, Chrome. *Syn.* CHROMATE OF LEAD, YELLOW C. OF L.; PLUMBI CHROMAS, PLUMBI CHROMAS FLAVUM, L. The preparation of the pure salt is noticed under CHROMIUM and LEAD; that of the commercial pigment is as follows:—

1. Add a filtered solution of nitrate or acetate of lead to a like solution of neutral chromate of potash, as long as a precipitate falls; then collect this, wash it well with clean soft water, and dry it out of the reach of sulphuretted vapours.

2. To the lye of chromate of potash, prepared by roasting the chrome ore with nitre, and lixiviation with water, add a solution of acetate of lead, and otherwise proceed as before.

3. Dissolve acetate of lead in warm water, and add of sulphuric acid, q. s. to convert it into sulphate of lead; decant the clear liquid (vinegar), wash the residuum with soft water, and digest it, with agitation, in a hot solution of neutral (yellow) chromate of potash, containing 1 part of that salt to every three parts of sulphate of lead operated on; afterwards decant the liquid, which is a solution of sulphate of potash, and carefully drain, wash, and dry the newly formed pigment. The product contains much sulphate of lead, but covers as well, and has as good a colour, as pure chromate of lead, whilst it is much cheaper. The shade may be varied by increasing or lessening the quantity of the chromate.[1]

Obs. Four shades of this beautiful pigment are met with in the shops, viz., pale yellow or straw colour, yellow, deep yellow, and orange. The former are made by adding a little alum or sulphuric acid to the solution of the chromate before mixing it with the solution of lead; the last, by the addition of a little subacetate of lead (tribasic acetate), or by washing the precipitate with a weak alkaline lye. The darker colour appears to arise from a little 'dichromate' being thrown down intimately mixed with the neutral chromate, and the paler shades from a slight excess of acid, or from the presence of water-sulphate of lead, and, occasionally, alumina. The colour is also influenced by the temperature of the solutions at the time of admixture. Anthon has found that, when hot solutions of equal equivalents of acetate of lead (190 parts) and chromate of potash (100 parts, both neutral and in crystals) are mixed, the yellow precipitate, when dried, is anhydrous; but when the mixture is made at ordinary temperatures, the precipitate has a paler yellow, and when dried contains 1 eq., or nearly 5¼% of water. ('Buch. Rept.') It thus appears that the shades of colour of chrome yellow may be varied, without any foreign addition. In practice, the third formula will be found very satisfactory. See ORANGE CHROME and CHROME RED.

Dutch Pink. *Prep.* Take of French berries, 1 lb.; turmeric, ½ lb.; alum, ½ lb.; water, 1½ gal.; boil ½ an hour, strain, evaporate to 2 quarts, adding of whiting, 3 lbs., and dry by a gentle heat. Starch, or white lead, is sometimes employed, instead of whiting, to give it a body. Golden yellow. *Used* as a pigment; but will not glaze like brown pink.

English Pink. *Syn.* LIGHT PINK. As the last, but using 5 lbs. of whiting.

Indian Yellow. See PURREE.

King's Yellow. Factitious tersulphuret of arsenic.

Naples Yellow. *Syn.* MINERAL YELLOW. *Prep.* Take of metallic antimony, in powder, 3 lbs.; red lead, 2 lbs.; oxide of zinc, 1 lb.; mix, calcine, well triturate the calx, and fuse it in a covered crucible; the fused mass must be reduced to an impalpable powder by grinding and elutriation.

2. Flake white, 1½ lb.; diaphoretic antimony, ½ lb.; calcined alum, 1 oz.; sal ammoniac, 2 oz.; calcine in a covered crucible with a moderate heat for 3 hours, so that at the end it may be barely red hot. More antimony and sal ammoniac turn it on the gold colour.

3. (Guimel.) Washed diaphoretic antimony,

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[1] Armengaud's 'Génie Industriel,' April, 1853.

1 part; pure red lead, 2 parts; grind them to a paste with water, and expose this mixture to a moderate red heat for 4 or 5 hours, as before. *Used* in oil, porcelain, and enamel painting. Chrome has now nearly superseded it for ordinary purposes.

Patent Yellow. *Syn.* CASSEL YELLOW, MONTPELLIER Y., TURNER'S Y. *Prep.* Take of dry chloride of lead, 28 parts; pure carbonate of lead, 27 parts; grind them together, fuse, and powder.

2. Common salt, 1 part, and litharge, 4 parts, are ground together with water, and digested at a gentle heat for some time, water being added to supply the loss by evaporation; the carbonate of soda formed is then washed out with more water, and the white residuum heated until it acquires a fine yellow colour. Works well in oil. Chiefly used in coach-painting. See OXYCHLORIDE OF LEAD.

Weld Yellow. Prepared from a decoction of weld brightened with a little alum, in the same manner as Dutch pink. *Used* chiefly for paper hangings.

YTTRIUM. Y. The oxide of this metal (yttria), a rare, white earth, was discovered by Gadolin, in 1794, in a mineral from Ytterby, in Sweden, since called gadolinite. Yttrium was obtained by Wöhler, in 1828, as a brittle, dark gray metal, made from the chloride by the action of sodium. Its salts have in general a sweetish taste, and the sulphate and several others an amethystine colour. Its solutions are precipitated by pure alkalies, but alkaline carbonates, especially carbonate of ammonium, dissolve it in the cold. They are distinguished from glucinium salts by the colour of the sulphate, by being insoluble in pure alkalies, and by yielding a white precipitate with ferrocyanide of potassium. Yttria may be obtained from gadolinite by a similar process to that by which glucina is extracted from the beryl.

According to Prof. Mosander, ordinary yttria is a mixture of the oxides of not less than three metals—yttrium, erbium, and terbium. These metals differ from each other in many important particulars. The first is a powerful base, and the others are said to be weak ones. They are separated with extreme difficulty, and are only interesting in a scientific point of view.

ZAF'FRE. *Syn.* SAFFRA, SAFFLOR, ZAFFER. Crude oxide of cobalt, obtained by roasting cobalt ore, reduced to an impalpable powder, and then ground with 2 or 3 parts of very pure quartzose or siliceous sand. *Used* as a blue colour by enamellers and painters on porcelain and glass. Chiefly imported from Saxony. See SMALTS.

ZE'RO. See THERMOMETER.

ZESTS. See POWDERS, SAUCE, SPICE, &c.

ZINC. Zn. *Syn.* ZINK, SPELTER; ZINCUM (Ph. L. E. & D.), L. This metal was *first noticed by Paracelsus*, in the 16th century, who called it 'zinetum;' but its ores must have been known at a much earlier period, as the ancients were acquainted with the manufacture of brass.

Prep. The zinc of commerce is obtained from the native sulphide (zinc blende), or carbonate (calamine), by roasting those ores, and distilling the calx with carbonaceous matter in a covered earthen crucible, having its bottom connected with an iron tube, which terminates over a vessel of water situated beneath the furnace. The first portion that passes over contains cadmium and arsenic, and is indicated by what is technically called 'brown blaze;' but when the metallic vapour begins to burn with a bluish-white flame, or the 'blue blaze' commences, the volatilised metal is collected.

The following method, by which several pounds of chemically pure zinc may be obtained in about ½ of an hour, will be found very useful:—Melt the zinc of commerce in a common crucible, and granulate it by throwing it into a tolerably deep vessel of water, taking care that the metal be very hot at the time; dry the metallic grains, and dispose them by layers in a Hessian crucible with ¼ of their weight of nitrate of potassium, using the precaution to place a slight excess at the top and at the bottom; cover the crucible, and secure the lid, then apply heat; after the vivid deflagration which occurs is over, remove the crucible from the fire, separate the dross with a tube, and, lastly, run the zinc into an ingot mould. This zinc, tested in Marsh's apparatus during entire days, has never given any stain, and in solution the most sensitive reagents, such as hydro-sulphocyanic acid, have never indicated the least atom of iron. ('Journ. de Pharm.')

Prop. Zinc is a bluish-white metal, having the sp. gr. 6·8 to 7·2; tough (under some circumstances, brittle) when cold, ductile and malleable at from 250° to 300° Fahr.; brittle and easily pulverised at 400°; fuses at 773° (Daniell); at a white heat it boils, and sublimes unchanged in close vessels; heated to whiteness (941° Daniell) in contact with the air, it burns with a brilliant green light, and is converted into oxide. It is very soluble in dilute sulphuric and hydrochloric acid, with the evolution of hydrogen gas.* It is little acted on by the air, even when moist. The salts of zinc are colourless.

Pur. Commercial zinc is never pure. Its specific gravity is 6·86. It is soluble in nitric, hydrochloric, and dilute sulphuric acids.

Tests. 1. The solutions of zinc give a gelatinous white precipitate with the alkalies, and carbonate of ammonium, which is completely redissolved by an excess of the precipitant.—2. The carbonates of potassium and sodium give a white precipitate of carbonate of zinc. All the above precipitates acquire a lemon-yellow colour when dried and heated, but again become white on cooling.—3. Sulphide of ammonium gives, in neutral solutions, a white precipitate, insoluble in excess of the precipitant, or in solutions of hydrate of potassium or ammonium, but freely soluble in the dilute mineral acids.—4. Sulphuretted hydrogen, in neutral and alkaline solutions, also gives a like white precipitate.—5. Ferrocyanide of potassium gives a gelatinous white precipitate.

Estim., *&c.*—*a.* 100 grs. are digested in dilute hydrochloric acid in excess, and the insoluble portion, which is chiefly carbon, dried and weighed.

b. The acidulous solution (see *a*) is next treated with a current of sulphuretted hydrogen until it smells very strongly of that gas; the whole is then left for some time in a warm situation. The precipitate which subsides consists of the sulphides of arsenic, cadmium, copper, lead, &c., if any of these metals were present in the sample.

c. The filtrate from *b*, after being boiled, is treated with a little nitric acid, after which it is again boiled, and, when cold, is precipitated with carbonate of barium added in excess; the precipitate (ferric hydrate) is then collected, dried, ignited, and weighed. The weight, in grains, multiplied by ·7, gives the per-centage of iron in the sample examined.

d. The filtrate from *c* is next precipitated with dilute sulphuric acid, and solution of carbonate of sodium is added in excess to the filtered liquid; the whole is then boiled, after which the new precipitate is washed, dried, gently ignited for some time, and then cooled and weighed. The weight, in grains, multiplied by ·80247, gives the per-centage of pure zinc in the sample.

Uses, *&c.* Zinc is used to form galvanic plates; in fireworks, and in medicine. Of late years it has also been extensively used in the manufacture of vessels of capacity, tubing, sheets for roofing, and other things that require lightness and durability.

Zinc, Amalgamated which is employed for voltaic batteries, is prepared as follows:—The plates, having been scoured with emery, are immersed for a few seconds in dilute sulphuric acid, then rinsed in clean soft water, and, after the loose water has drained from their surface, dipped into a strong solution of either mercuric nitrate or chloride, or into equal parts of a mixture of saturated solutions of mercuric chloride and acetate of lead; the plates are, lastly, dipped into water, and then rubbed with a soft cloth. Another and simpler method is to rub mercury over the plates while wet with dilute sulphuric acid.

Zinc, Granulated. *Syn.* ZINCUM GRANULATUM (B. P.). Fuse commercial zinc in a crucible, pour it in a very thin stream into a bucket of cold water, and afterwards dry the zinc.

Zinc, Ac′etate of. $Zn(C_2H_3O_2)_2$. *Syn.* ZINCI ACETAS, L. *Prep.* 1. (Ph. D.) Acetate of lead, 1 lb., is dissolved in distilled water, 2½ pints, and the solution being placed in a cylindrical jar, sheet zinc, 4 oz., rolled into a coil, is immersed therein; after 24 hours the liquid is decanted, evaporated to 15 oz., and solution of hypochlorite of calcium added drop by drop, until a reddish precipitate ceases to form; the liquid is then filtered, acidulated by the addition of a few drops of acetic acid, reduced by evaporation to 10 fl. oz., and set aside to crystallise; the crystals are dried on bibulous paper set on a porous brick, and then preserved in a well-stopped bottle. More crystals may be obtained from the mother-liquor.

Prop., *&c.* Efflorescent, white, hexagonal plates, having a powerful stypic taste; very soluble in water; less soluble in alcohol; decomposed by heat. It is tonic, antispasmodic, and emetic.—*Dose.* 1 to 2 grs.; as an emetic, 10 to 20 grs.; externally, 2 or 3 grs. to water, 1 fl. oz., as an astringent lotion or injection.

Zinc, Bro′mide of. $ZnBr_2$. *Syn.* ZINCI BROMIDUM, L. Prepared like the corresponding salt of iron.

Zinc, Car′bonate of. $ZnCO_3$. *Syn.* ZINCI CARBONAS PURUM, ZINCI CARBONAS (B. P., Ph. D.), L. *Prep.* 1. (Ph. D.) Solution of chloride of zinc (Ph. D.), 1 pint, is added, in successive portions, to a solution of crystallised carbonate of sodium of commerce, 2 lbs., dissolved in boiling distilled water, 6 pints, and the whole is boiled until gas ceases to be evolved; the precipitate is then washed, and dried, at first on blotting-paper, and, finally, by a steam or water heat.

Zinc, Chlo″ride of. $ZnCl_2$. *Syn.* BUTTER OF ZINC, MURIATE OF Z.†; ZINCI CHLORIDUM (B. P., Ph. L.), Z. MURIAS†, L. *Prep.* 1. By heating metallic zinc in chlorine.

2. (Ph. L.) Hydrochloric acid, 1 pint; water, 1 quart; add zinc (in small pieces), 7 oz.; when the effervescence is nearly finished, apply heat until bubbles cease to be evolved; decant the clear, and evaporate to dryness; fuse the resulting mass in a lightly covered crucible, by a red heat, pour it out on a flat smooth stone, and, when cold, break it into small pieces, or cast it into rods in iron moulds, and preserve it in a well-stoppered bottle.

3. (In SOLUTION.)—*a.* (LIQUOR ZINCI CHLORIDI—Ph. D.) Hydrochloric acid and water, of each, 2½ pints; sheet zinc, 1 lb.; dissolve, filter through calico, add of hypochlorite of calcium, 1 fl. oz., and evaporate, by boiling, to a pint; when cold, pour it into a bottle, add of prepared chalk, 1 oz., and water, q. s. to make the whole measure 1 quart; agitate occasionally for 24 hours, decant or filter, and preserve the liquid in a stoppered bottle. Sp. gr. 1·593. See SOLUTIONS.

b. (E. Parrish.) Granulated zinc, 4 lbs.; hydrochloric acid, 4 lbs., or q. s.; water, 9 quarts; dissolve, avoiding excess of acid. The solution contains 1 in 12 of chloride of zinc. Recommended as of the proper strength for a disinfectant.

Prop., *&c.* When pure, a colourless, amorphous mass or crystals; generally a whitish-gray, semi-transparent mass, having the consistence of wax; fusible; volatile at a strong heat, condensing in acicular crystals; freely soluble in alcohol, ether, and water; highly deliquescent; coagulates albumen and gelatin, and corrodes animal substances. The solution possesses the same properties in a minor degree.

Pur. From the aqueous solution, hydro-sulphuric acid or ferrocyanide of potassium being dropped in, a precipitate is thrown down. What is thrown down by ammonia or hydrate of potassium from the same solution is white, and is redissolved by either precipitant in excess. The precipitate thrown down by the carbonate of either ammonium or potassium is (also) white, but is not redissolved when these are added in excess.

Uses, &c. Dry chloride of zinc is chiefly used as a caustic, for which it is highly recommended by Voght, Canquoin, and others. It is more powerful than chloride of antimony, and its action extends deeper than does nitrate of silver, whilst it exercises an influence over the vital actions of neighbouring parts. The sore is generally healthy after the separation of the eschar, and no constitutional disorder ensues. It has been given in scrofula, epilepsy, chorea, &c.; and, combined with hydrocyanic acid, in facial neuralgia.—*Dose.* ½ gr. to 2 grs.; externally, as a lotion, 2 to 3 grs. to water, 1 oz. In large doses it is poisonous.

The solution (LIQUID CHLORIDE) is also used as a caustic, but chiefly as a disinfectant and deodorizer, of which it is one of the very best, possessing, as it does, the power of rapidly decomposing sulphide of ammonium and the organic matter of miasmata which convey disease.

Zinc, Cy'anide of. $ZnCy_2$. *Syn.* CYANURET OF ZINC; ZINCI CYANIDUM, ZINCI CYANURETUM, L. *Prep.* (P. Cod.) Add a solution of cyanide of potassium to another of pure sulphate of zinc; wash, and dry the precipitate. —*Dose.* ⅛ to 1 gr., twice a day; in epilepsy, hysteria, and other nervous affections, heartburn, worms, &c.; and as a substitute for hydro-cyanic acid.

Zinc, Ferrocy'anide of. Zn_2FeCy_6. *Syn.* ZINCI FERROCYANIDUM, L. *Prep.* By adding a hot solution of ferrocyanide of potassium to a hot and strong solution of pure sulphate of zinc, and washing, and drying the precipitate. White.—*Dose.* 1 to 4 grs.; in the same cases as the last.

Zinc, I'odide of. ZnI_2. *Syn.* HYDRIODATE OF ZINC†; ZINCI IODIDUM, ZINCI HYDRIODAS, L. *Prep.* 1. (Duflos.) Iodine, 2 parts; granulated zinc, 1 part; water, 4 parts; proceed as for ferrous iodide, only employing a glass or porcelain vessel.

2. (Magendie.) Iodine, 17 parts; zinc (in powder), 20 parts; mix, and sublime in a matrass.

Prop., &c. Deliquescent. Chiefly used externally; 15 grs. to water, 6 fl. oz., as a collyrium in scrofulous inflammation of the eye (Poulet); 1 dr. to lard, 1 oz., as a powerful resolvent in scrofulous and other glandular swellings, rubbed on the part twice a day. (Ure.)

Zinc, Lac'tate of. $Zn(C_3H_5O_3)_2$. *Syn.* ZINCI LACTAS, L. Prepared from zinc in the same way as ferrous lactate is from iron.

Zinc, Ox'ide of. *Syn.* PROTOXIDE OF ZINC; ZINCI OXYDUM (B. P., Ph. L. E. & D.), L. *Prep.* 1. (Ph. L.) Sulphate of zinc (pure), 1 lb.; carbonate of ammonium, 6½ oz.; dissolve each separately in 6 quarts of water, filter, mix the solutions, well wash the precipitate with water, and calcine it for 2 hours in a strong fire. The Ph. E. is nearly similar.

2. (Ph. D.) Place carbonate of zinc in a covered clay crucible, and expose it to a very low red heat, until a portion taken from the centre of the mass ceases to effervesce on being dropped into dilute sulphuric acid.

Prop., &c. A white, tasteless powder; insoluble in water; freely soluble in acids, the solution yielding colourless and easily crystallisable salts; strongly basic.

Uses, &c. It is tonic and antispasmodic, and has been advantageously used in chorea, epilepsy, and other nervous and spasmodic affections.—*Dose.* 1 to 6 grs., twice a day. It is also used as a dusting powder, and to make an ointment. It has been proposed as a substitute for white lead in painting, than which it covers better, but dries slower, and hence requires the addition of dried white vitriol. This oxide is the only compound which zinc forms with oxygen.

Zinc, Sulphate of. $ZnSO_4$. *Syn.* WHITE COPPERAS*, WHITE VITRIOL*; ZINCI SULPHAS (B. P., Ph. L. E. & D.), L. *Prep.* 1. (Ph. L.) Granulated zinc, 5 oz.; diluted sulphuric acid, 1 quart; dissolve, filter, evaporate to a pellicle, and set it aside to crystallise.

2. (Ph. D.) Zinc (laminated or granulated), 4 oz.; sulphuric acid, 3 fl. oz.; water, 1 pint; mix in a porcelain capsule, and, when gas ceases to be evolved, boil for 10 minutes, filter through calico, and evaporate the filtrate to dryness; dissolve the dry salt in water, 1 pint; frequently agitate the solution, when cold, during 6 hours, with prepared chalk, ¼ oz.; next filter, acidulate the filtrate with nitric acid and dilute sulphuric acid, of each, 1 fl. dr.; evaporate until a pellicle forms on the surface, and set it aside to crystallise; dry the crystals on bibulous paper, without heat, and preserve them in a bottle. More crystals may be obtained from the mother-liquor.

3. The common sulphate of zinc of commerce frequently contains copper, cadmium, lead, iron, and manganese, and nearly always one or more of them. By digesting its concentrated solution for some time with metallic zinc, it may be freed from copper, lead, and cadmium, for these metals are all reduced and precipitated in a metallic state; or, the acidu-

lated solution may be treated with sulphuretted hydrogen as long as any precipitate forms. In order to separate the iron, chlorine gas may be passed into the solution, by which the iron is converted into the ferrous chloride; if this solution be exposed to the air for a length of time, it absorbs oxygen, and oxide of iron is deposited as a yellow powder, from which the solution must be filtered. When the sulphate contains manganese, which is not very often the case, the solution must be boiled up a few times with purified charcoal, filtered and evaporated. 'Jour. für prakt. Chem.') The product of each of the above formulæ is nearly chemically pure.

4. (*Commercial.*) The crude sulphate of zinc (white copperas, or white vitriol, of the shops) is prepared by roasting native sulphide of zinc (zinc blende) in a reverberatory furnace, exposing the calcined mass to the air and humidity for some time, then lixiviating it, and evaporating the resulting solution until it forms a white semicrystalline mass on cooling.

Prop. Pure sulphate of zinc forms inodorous, colourless, transparent, quadrangular prisms, closely resembling in appearance those of Epsom salt, which effloresce slightly in the air, and contain 7 equiv. of water; it has a slightly acidulous and very styptic metallic taste; the crystals dissolve in 2½ parts of cold and in less than their own weight of boiling water; they are insoluble in alcohol. The crude sulphate of zinc of commerce (white vitriol) occurs in irregular granular masses, which somewhat resemble loaf sugar.

When a solution of this salt, in 6 of water, is boiled with a little nitric acid, and a solution of ammonia is then added until the oxide of zinc at first precipitated is all redissolved, no yellow precipitate remains, or a trace only, and the solution is colourless.

Uses. In medicine, as a tonic, antispasmodic, &c.; in doses of 1 to 2 grs., twice daily; as an emetic, 10 to 30 grs. In large doses it is poisonous. It has been employed with benefit in dyspepsia, fluor albus, chorea, epilepsy, hooping-cough, and other convulsive and nervous affections, generally combined with bitters, foxglove, hemlock, henbane, or opium. As an emetic, it acts almost immediately, and is therefore well suited to empty the stomach at the commencement of a fit of ague, and in cases of poisoning, &c. It is also extensively used externally, to form astringent and repellent collyria, injections and lotions.

Zinc, Vale″rianate of. $Zn(C_5H_9O_2)_2$. *Syn.* Zinci valerianas, (B.P., Ph.D.) *Prep.* (Ph. D.) Valerianate of sodium, 2½ oz., and sulphate of zinc, 2 oz. 7½ drs., are each separately dissolved in distilled water, 1 pint; the solutions are then heated to 200° Fahr., mixed, and the resulting crystals skimmed off; the liquid is next evaporated at a temperature not higher than 200°, until it measures 4 fl. oz., the crystals, as they form, being removed from the surface; the salt thus obtained is steeped, for an hour, in distilled water, just sufficient to cover it, after which the whole is transferred to a paper filter, on which it is at first drained, and then dried at a heat not exceeding 100°.

Prop., &c. Brilliant white, pearly scales; very light; astringent; smells strongly of valerianic acid; only slightly soluble in cold water, more so in hot water, and freely soluble in alcohol and ether; exposure to heat rapidly decomposes it; exposure to the air also decomposes it, but more slowly. It is regarded as powerfully antispasmodic and tonic.—*Dose.* 1 to 3 grs., thrice daily, made into pills; in neuralgia, tic douloureux, nervous headaches (more particularly hemicrania), hysteria, palpitation of the heart, vertigo, chorea, epilepsy, &c.

Obs. Butyrate of zinc scented with valerianic acid, which is often sold for the above compound, may be detected by distilling it with sulphuric acid; the distillate, tested with a strong solution of acetate of copper, gives a bluish-white precipitate if it contains butyric acid. The valerianate is distinguished from the other salts of zinc by its extreme lightness.

ZINC-E′THYL. $Zn(C_2H_5)_2$. A curious liquid body, discovered by Dr. Frankland, and formed, along with iodide of zinc, when iodide of ethyl is heated with pure zinc in a sealed glass tube. The mixed white product, by distillation in a current of hydrogen, yields pure zinc-ethyl. It is a highly volatile liquid, having a rather disagreeable odour, and so rapidly decomposed by contact with the air that it takes fire. Water resolves it into hydride of ethyl, and other products.

ZINC-ME′THYL. $Zn(CH_3)_2$. Obtained by the action of zinc upon iodide of methyl, as zinc-ethyl. It takes fire on coming in contact with the air.

ZINC′ING. *Syn.* Zinking. Vessels of copper and brass may be covered with a firmly adherent layer of pure zinc, by boiling them in a solution of chloride of zinc, pure zinc turnings being at the same time present in considerable excess. The same object may be effected by means of zinc and a solution of chloride of ammonium or hydrate of potassium.

The variety of zinced iron commonly known by the name of 'galvanised iron' is prepared by immersing the sheets of metal, previously scoured and cleaned with dilute hydro-chloric acid, in a bath of melted zinc covered with powdered sal ammoniac, and moving them about until they are sufficiently coated.

ZINCOG′RAPHY. An art closely resembling lithography, in which plates of zinc are substituted for slabs of stone.

ZIR′CON. See Gems.

ZIRCONIUM. Zr. *Syn.* The oxide of this metal, a white pulverulent earth, discovered in the mineral jargon or zircon of Ceylon, by Klaproth, in 1789. It has since been found in the hyacinth.

Prep. The stone is calcined and thrown into cold water, and then powdered in an agate mortar; the powder is mixed with 9 parts of pure hydrate of potassium, and the mixture projected, by spoonfuls, into a red-hot crucible, care being taken that each portion is fused before another is added; after fusion, with an increased heat, for an hour and a half, the whole is allowed to cool; the calcined mass is next powdered, and boiled in water; the insoluble portion is then dissolved in hydrochloric acid, and the solution heated, that the silicic acid may fall down; after which the zirconia is precipitated with hydrate of potassium; or, the zirconia may be precipitated with carbonate of sodium, and the carbonic acid expelled by heat.

From this metallic zirconium is obtained by heating in a glass tube, with a spirit lamp, a mixture of potassium and the double fluoride of zirconium and potassium, carefully dried; the product is washed with water, and digested for some time in dilute hydrochloric acid.

Prop., &c. A black powder; it acquires a feeble metallic lustre under the burnisher, and takes fire when heated in the air. It has not been thoroughly examined.

Oxide of zirconium, or zirconia, ZrO_2, has neither taste nor odour, is insoluble in water, and forms salts with the acids. It is distinguished from all the other earths, except thorina, by being precipitated when any of the neutral salts of zirconium are boiled with a saturated solution of sulphate of potassium. The salts of zirconium are distinguished from those of aluminium and glucinium by being precipitated by all the pure alkalies, and by being insoluble when they are added in excess. The precipitated hydrate and carbonate are readily soluble in acids.

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